BOSTON LOGAN INTERNATIONAL AIRPORT

2020/2021 EDR
ENVIRONMENTAL DATA REPORT

November 2022

EEA #3247

SUBMITTED TO

Executive Office of Energy and Environmental Affairs, MEPA Office

SUBMITTED BY

Massachusetts Port Authority
Strategic & Business Planning

PREPARED BY

vhb

IN ASSOCIATION WITH

Harris Miller Miller & Hanson
Crawford, Murphy & Tilly
ICF
Inter*VISTAS* Consulting

BOSTON LOGAN INTERNATIONAL AIRPORT

2020/2021 EDR
ENVIRONMENTAL DATA REPORT

November
2022

EEA #3247

SUBMITTED TO

Executive Office of Energy
and Environmental Affairs,
MEPA Office

SUBMITTED BY

Massachusetts Port Authority
Strategic & Business Planning

PREPARED BY

vhb

IN ASSOCIATION WITH

Harris Miller Miller & Hanson
Crawford, Murphy & Tilly
ICF
Inter*VISTAS* Consulting

Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909
Telephone (617) 568-5000
www.massport.com

November 15, 2022

The Honorable Bethany A. Card, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Analyst, EEA 3247
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: Boston Logan International Airport 2020/2021 Environmental Data Report - EEA #3247

Dear Secretary Card and Director Kim:

On behalf of the Massachusetts Port Authority (Massport), we are pleased to submit this 2020/2021 *Environmental Data Report* (EDR) for Boston Logan International Airport (Logan Airport or the Airport). This filing continues Massport's over four-decade practice of providing an extensive record of Logan Airport environmental trends, facility planning, operations and passenger data, and Massport's mitigation commitments. At the Secretary's direction, this combined *2020/2021 EDR* provides an overview of an extraordinary period in the history of Logan Airport resulting from the ongoing COVID-19 pandemic.

The dramatic nature of the COVID-19 pandemic, and its global impacts, the US and local economies, and to the aviation industry in particular, were more intensely experienced at Logan Airport than many other US airports. Beginning in March 2020, flights in and out of Logan Airport were reduced and passenger levels dropped by over 90 percent at the peak of the pandemic in the spring and summer of 2020. 2020 annual passengers dropped to levels of activity not seen since the mid-1970s. There were far fewer aircraft operations, passengers, and ground traffic, and a similar drop in overall Logan Airport activity. Activity levels began a slow recovery in mid-summer 2020 and continued through 2021. For the first 8 months of 2022 (January to August), operations were down 13 percent and passengers were down 18 percent compared to the first 8 months of 2019.

As a result of this significant reduction in Airport activity and revenues, Massport, our airlines, and other tenants adjusted their capital and operations plans. Concurrently, the schedule for a number of Airport projects and programs have been adjusted. Chapter 3, *Airport Planning*, includes the most current project updates through the end of September 2022.

Logan Airport passenger and operational levels are generally tied closely to the strong local, regional, national, and international economies and its role as the major airport to a region that is the home to world-class educational and medical institutions, cutting-edge technology companies, rich historical resources, and extensive tourism. Logan Airport's recovery and the timeframe will similarly be driven by the national and regional economic recovery.

As the economic recovery advances, Massport continues to evaluate and carefully plan for the recovery of aircraft operations and air passenger activity, and remains committed to implementing the broad range of environmental and operating strategies designed to reduce the impacts

associated with Airport operations. Most notable is the early 2022 announcement of Massport's "*Roadmap to Net Zero*". This bold, Authority-wide environmental initiative aims to reduce Massport-controlled emissions to net zero by 2031, the 75th anniversary of the Massachusetts Port Authority. As one of New England's largest transportation hubs, emission reduction at Logan Airport is a centerpiece of this program. By addressing building efficiency, transitioning to clean energy, updating our vehicle fleets to electric vehicles, and collaborating with our tenants, airlines, and other business partners, we have the opportunity to dramatically reduce emissions in a way that will improve air quality while still serving as a regional economic engine.

Massport will continue to seek opportunities to implement measures designed to reduce Logan Airport's operating and environmental impacts. Such measures are tied to High Occupancy Vehicle (HOV) strategies, noise abatement procedures, emission reduction and energy efficiency measures, as well as continued information sharing with interested stakeholders and our neighbors.

Additionally, this EDR, in response to community input, includes discussion on the evolving science and studies of aircraft noise and emissions and associated public health investigations. Through both this EDR and future EDRs/ESPRs, we hope both to share the most recent, available information and, where possible, support those studies that will ultimately guide evolving regulations and mitigation strategies.

EDR Content and Structure

The *2020/2021 EDR* responds to the Secretary's Certificate on the *Boston Logan International Airport 2018/2019 EDR* dated March 2021. The EDR also updates conditions for the following categories:

- Passenger levels, aircraft operations, aircraft fleets, and cargo volumes;
- Planning, design, and construction activities at Logan Airport;
- Regional transportation statistics and initiatives;
- Key environmental indicators (Ground Access, Noise Abatement, Air Quality/Emissions Reduction, and Environmental Compliance and Management/Water Quality);
- Status of Logan Airport project mitigation; and
- Sustainability initiatives.

The *2020/2021 EDR* includes the Secretary's Certificate on the *Boston Logan International Airport 2018/2019 EDR* and associated comment letters. Certificates received on the Logan Airport Parking Project (EEA# 15665) and Terminal E Modernization Project (EEA# 15434), which included items to be addressed in future EDRs and ESPRs are also included. Appendix D, *Distribution* presents the EDR distribution list and supporting technical appendices are available electronically.

Review Period, Distribution, and Consultation

As we have done in the past for multi-year documents, Massport has requested EEA's consideration of an extended public comment period for this EDR. Based on this request, the public comment period will begin on November 23, 2022, the publication date of the next MEPA *Environmental Monitor*, and will end on January 6, 2023. The distribution list included as Appendix D indicates which listed parties will receive a digital and/or printed copy of this EDR or notice of availability. As with the recent EDRs

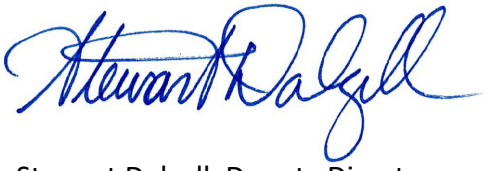
and other Massport environmental filings, this EDR is presented in its entirety on Massport's website (http://www.massport.com/massport/about-massport/project-environmental-filings/). The Executive Summary is translated into Spanish, and is available in other languages upon request by contacting Brad Washburn at (617) 568-3546 or bwashburn@massport.com.

A public consultation session on the *2020/2021* EDR will be held on December 15, 2022. Meeting details will also be available in the *Environmental Monitor* and on Massport's website. Additional copies of the *2020/2021 EDR* may be obtained by calling (617) 568-3546 or emailing bwashburn@massport.com during the public comment period.

We look forward to your review of this document and to consultation with the MEPA Office and other reviewers. Please feel free to contact me at sdalzell@massport.com, if you have any questions.

Sincerely,

Massachusetts Port Authority



Stewart Dalzell, Deputy Director
Environmental Planning & Permitting,
Strategic & Business Planning Department

cc: J. Barrera, F. Leo, A. Coppola, C. McDonald, B. Washburn/Massport

This Page Intentionally Left Blank.

Table of Contents

List of Appendices

MEPA Appendices

Technical Appendices (Printed copies available upon request)

List of Tables

List of Figures

Acronyms

This section provides a list of acronyms and abbreviations that are found in the *2020/2021 EDR*.

A

AAAE	American Association of Airport Executives
AADT	Annual Average Daily Traffic
ACA	Airport Carbon Accreditation Program
ACI-NA	Airports Council International – North America
ACRP	Airport Cooperative Research Program
ADA	Americans with Disabilities Act
AEDT	Aviation Environmental Design Tool
AFV	Alternative Fuel Vehicle
ALP	Airport Layout Plan
APU	Auxiliary Power Unit
ARP	American Rescue Plan Act of 2021
ARFF	Airport Rescue and Fire Fighting
ARR	Arrivals
ARRA	American Recovery and Reinvestment Act
ASCENT	Aviation Sustainability Center
ASPM	Aviation System Performance Metrics
AST	Aboveground Storage Tanks
ATMS	Automated Traffic Monitoring System
AUL	Activity and Use Limitation
AWDT	Annual Average Weekday Daily Traffic
AWEDT	Annual Average Weekend Daily Traffic
A4A	Airlines for America

B

BADA	Base of aircraft data
BC	Black Carbon
BDL	Bradley International Airport, CT airport code
BED	Hanscom Field, MA airport code
BGR	Bangor International Airport, ME airport code
BIF	Bird Island Flats
BLANS	Boston Logan Airport Noise Study
BMP	Best Management Practice
BOS	Boston Logan International Airport, MA airport code
BPDA	Boston Planning & Development Agency
BRT	Bus Rapid Transit
BTV	Burlington International Airport, VT airport code
BWSC	Boston Water and Sewer Commission

C

CA/T	Central Artery/Tunnel

CAA	Clean Air Act
CAA	Connecticut Airport Authority
CAC	Community Advisory Committee
CACES	Center for Air Climate and Energy Solutions
CACI	Clean Air Construction Initiative
CAEP	Committee on Aviation Environmental Protection
CAGR	Compound Annual Growth Rate
CARES Act	Coronavirus Aid, Relief, and Economic Security Act
CAT III	Category III (instrument landing system)
CBP	U.S. Customs and Border Protection
CEDDS	Complete Economic and Demographic Data Source
CFC	Chlorofluorocarbon
CFR	Code of Federal Regulations
CEO	Chief Executive Officer
CH_4	Methane
CIP	Capital Improvement Plan
CMR	Code of Massachusetts Regulations
CNG	Compressed Natural Gas
CNI	Cumulative Noise Index
CO	Carbon monoxide
CO_2	Carbon dioxide
CO_2eq	CO_2 equivalents
CONEG	Conference of New England Governors
ConnDOT	Connecticut Department of Transportation
COPD	Chronic Obstructive Pulmonary Disease
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
CRO	Converging Runway Operations
CTPS	Central Transportation Planning Staff
CY	Calendar Year

D

dB	Decibel
dBA	A-weighted decibel
DEIR	Draft Environmental Impact Report
DEP	Departures
DERA	Diesel Emission Reduction Act
DFS	Department of Fire Services
DIRP	Disaster and Infrastructure Resiliency Planning Study
DNL	Day-Night Average Sound Level
DPH	Department of Public Health
DOT	U.S. Department of Transportation

E

EA	Environmental Assessment
EAS	Essential Air Service
EDR	Environmental Data Report
EDMS	Emissions and Dispersion Modeling System
EEA	Executive Office of Energy and Environmental Affairs
eGSE	Electric Ground Service Equipment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EJ	Environmental Justice

EMAS	Engineered Materials Arresting System
EMS	Environmental Management System
ENF	Environmental Notification Form
EPA	U.S. Environmental Protection Agency
EPNL	Effective Perceived Noise Level
EPNdB	Effective Perceived Noise Level (in decibels)
ESMF	Equipment Storage and Maintenance Facility
ESPR	Environmental Status and Planning Report
EV	Electric Vehicle

F

FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FBO	Fixed Base Operator
FDS	Fuel Distribution System
FEIR	Final Environmental Impact Report
FIS	Federal Inspection Services
FOA	First Order Approximation
FONSI	Finding of No Significant Impact
FRA	Federal Railroad Administration
FY	Fiscal Year

G

GA	General Aviation
GAO	Government Accounting Office
GDP	Gross Domestic Product
GEIR	Generic Environmental Impact Report
GFC	Global Financial Crisis
GHG	Greenhouse Gas
GIS	Geographic Information Systems
gpm	gallons per minute
GPS	Global Positioning System
GSA	General Services Administration
GSE	Ground Service Equipment
GTOC	Ground Transportation Operations Center
GUI	Graphic user interface
GWP	Global Warming Potential
GWSA	Global Warming Solutions Act

H

HAPS	Hazardous Air Pollutants
HCFC	Hydrochlorofluorocarbon
HOV	High Occupancy Vehicle
HVAC	Heating, Ventilation, and Air Conditioning
HVN	Tweed New Haven Airport, CT airport code
Hz	Hertz (unit of frequency)

I

IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
INM	Integrated Noise Model
IPCC	Intergovernmental Panel on Climate Change

IRA	Immediate Response Action
ISA	Inclined Safety Area
ISO	International Organization for Standardization
J	
JFK	John F. Kennedy International Airport, NY airport code
JOC	Joint Operations Center
K	
kBTU	Thousand British Thermal Units
kg	Kilogram
kWh	Kilowatt-hours
L	
lbs	Pounds
LCC	Low-Cost Carriers
LDMS	Logan Dispersion Modeling System
LED	Light-Emitting Diode
LEED®	Leadership in Energy and Environmental Design
LIAG	Logan Impact Advisory Group
LOC	Logan Office Center
LRTP	Long-Range Transportation Plan
LTO	Landing and Takeoff
M	
M.G.L.	Massachusetts General Laws
MA	Massachusetts
MAPC	Metropolitan Area Planning Council
MassBio	Massachusetts Biotechnology Council
MassCEC	Massachusetts Clean Energy Center
MassDEP	Massachusetts Department of Environmental Protection
MassDMF	Massachusetts Division of Marine Fisheries
MassDOT	Massachusetts Department of Transportation
Massport	Massachusetts Port Authority
MBTA	Massachusetts Bay Transportation Authority
MCO	Orlando International Airport, FL airport code
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
MHT	Manchester-Boston Regional Airport, NH airport code
MI	Major Infrastructure
MIT	Massachusetts Institute of Technology
MMT	Million Metric Tons
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOVES	Motor Vehicle Emission Simulator
MPO	Metropolitan Planning Organization
mph	Miles per hour
MT	Metric tons
N	
NA	Not Available
NAAQS	National Ambient Air Quality Standards
NCA	North Cargo Area
NCI	Noise Complaint Initiative

NEA	Northeast Alliance
NEC	Northeast Corridor
NEG/ECP	Conference of New England Governors and Eastern Canadian Premiers
NEM	Noise Exposure Map
NEPA	National Environmental Policy Act
NERASP	New England Regional Airport System Plan
NHESP	Natural Heritage and Endangered Species Program
NO_2	Nitrogen dioxide
NOMS	Noise and Operations Monitoring System
NO_x	Nitrogen oxides
NPC	Notice of Project Change
NPDES	National Pollutant Discharge Elimination System
NPSI	Noise Per Seat Index
NSA	North Service Area
N_2O	Nitrous oxide

O

O_3	Ozone
ORH	Worcester Regional Airport, MA airport code
OTR	Ozone Transport Region
O&D	Origin and Destination

P

PAH	Polycyclic Aromatic Hydrocarbon
PARC	Parking and Revenue Control
PARTNER	Partnership for Air Transportation Noise and Emissions Reduction
PATCO	Professional Air Traffic Controllers Organization
Pb	Lead
PBN	Performance-Based Navigation
PCA	Pre-Conditioned Air
PM	Particulate Matter (e.g., PM_{10}, $PM_{2.5}$)
PMO	Project Management Office
ppm	Parts per million
PPA	Power Purchase Agreement
PPE	Personal protective equipment
PRAS	Preferential Runway Advisory System
PSM	Portsmouth International Airport at Pease, NH airport code
PSP	Payroll Support Program
PVD	T.F. Green Airport, Warwick RI airport code
PWM	Portland International Jetport, ME airport code

Q

QTA	Quick Turnaround Areas

R

RACT	Reasonably Available Control Technology
RAM	Release Abatement Measure
RAO	Response Action Outcome
RCC	Rental Car Center
REC	Renewable Energy Credit
RFI	Request for Information
RFP	Request for Proposals
RIAC	Rhode Island Airport Corporation

RideApp	Ride Application such as Uber or Lyft
RIDOT	Rhode Island Department of Transportation
RIM	Runway Incursion Mitigation
RJ	Regional Jet
RNAV	Area Navigation
RNP	Required Navigation Performance
ROD	Record of Decision
RON	Remain Over Night
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RSIP	Residential Sound Insulation Program
RTC	Regional Transportation Center
RTN	Release Tracking Number

S

SAF	Sustainable Aviation Fuel
SAFE	Safer Affordable Fuel-Efficient Vehicles Rule
SCA	South Cargo Area
SDSG	Sustainable Design Standards and Guidelines
SID	Standard Instrument Departure
SIP	State Implementation Plan
SL1	Silver Line Bus
SMART	Solar Massachusetts Renewable Target Program
SMP	Sustainability Management Plan
SOG	Speciated Organic Gases
SOV	Single Occupancy Vehicle
SO_2	Sulfur dioxide
SPCC	Spill Prevention Control and Countermeasure Plan
SPL	Sound Pressure Level
SRE	Snow Removal Equipment
STEM	Science, Technology, Engineering, and Mathematics
SWPPP	Stormwater Pollution Prevention Plan
SWSA	Southwest Service Area

T

TA	Time Above
TAA	Tenant Alteration Application
TAC	Technical Advisory Committee (TAC)
TAF	Terminal Area Forecast
TDM	Transportation Demand Management
TIM	Time-in-Mode
TMA	Transportation Management Association
TNC	Transportation Network Company, also known as RideApp
tpy	Tons per year
TRB	Transportation Research Board
TSA	Transportation Security Administration
TSP	Total Suspended Particles
TSS	Total Suspended Solids

U

UAS	Unmanned Aircraft Systems
UFP	Ultrafine Particles

ULCC	Ultra Low-Cost Carriers
USC	United States Code
USGBC	U.S. Green Building Council
UST	Underground Storage Tank

V

VALE	Voluntary Airport Low Emissions Program
VMT	Vehicle Miles Traveled
VNM	Virtual Noise Monitors
VOC	Volatile Organic Compounds
VW	Volkswagen

W

WET	Whole Effluent Toxicity
WHO	World Health Organization

Other

$\mu g/m^3$	Micrograms of pollutant per cubic meter
µm	Micrometers

This Page Intentionally Left Blank.

1

Introduction/Executive Summary

Introduction

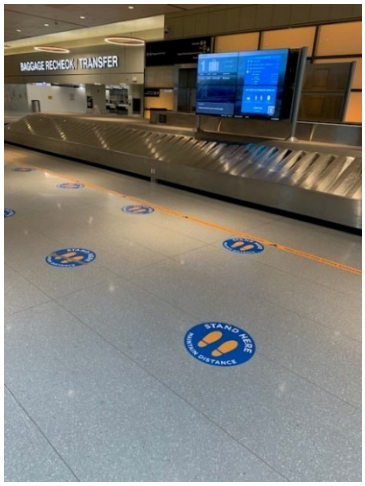
The Massachusetts Port Authority (Massport) is continuing its over four-decade practice of providing an extensive record of Boston Logan International Airport (Logan Airport or Airport) environmental trends, facility planning, operations and passenger levels, and Massport's mitigation commitments in this *Boston Logan International Airport 2020/2021 Environmental Data Report (EDR)*. Per the request of the Secretary of the Massachusetts Executive Office of Energy and Environmental Affairs (EEA), this *2020/2021 EDR* combines data and analysis for calendar years 2020 and 2021.

This EDR reports on 2020 and 2021, reflecting the significant changes at Logan Airport and throughout the aviation industry occurring as a result of the ongoing COVID-19 pandemic. Where available, Massport has included relevant updates through fall 2022 where the current conditions have resulted in changes in projects or programs that were in place in 2019 and prior. By year-end 2020, total flight operations were down approximately 50 percent and passenger levels were down by about 70 percent compared to year-end 2019, dropping to levels of activity not seen since the 1970s. However, aircraft operations increased in 2021, with total flight operations and passenger levels recovering to approximately 62 percent and 53 percent, respectively, of 2019 levels, showing a gradual return towards 2019 levels.

Air traffic declines caused by economic recessions and other "shocks" such as the events of September 11, 2001 and the Great Recession (Global Financial Crisis [GFC]) in 2008/2009 have been followed by gradual recovery cycles, as depicted in **Figure 1-1**, evidenced by a five year recovery after the events of September 11, 2001 and a three year recovery after the GFC. Nationally, as shown in **Figure 1-2**, 80 percent recovery to 2019 demand levels occurred in July 2021 as travel restrictions loosened and vaccines were made widely available. In December 2021, passenger demand at U.S. airports recovered to approximately 83 percent of 2019 levels. Much of the remaining recovery will be dependent on the return of both business travel and international travel, since domestic capacity across the U.S. has almost fully returned to 2019 levels. Full recovery will also be influenced by airline staffing.

As shown in **Figure 1-3**, demand in Boston, while nearing a 70 percent return to 2019 levels in late 2021, has lagged behind national demand by between 10 and 15 percent. This aligns with recovery patterns in other coastal urban markets where business travel and international travel have been slower to return to pre-pandemic levels. International passenger activity levels at Logan Airport are expected to return in 2022 and beyond.

COVID-19 is having an unprecedented impact on not just the aviation industry but the global economy. While the immediate and most pressing concern is human cost, COVID-19 has created profound implications for nearly all businesses and industries. The impact on aviation has been particularly severe. The situation is changing on a daily basis and there remains considerable uncertainty as to the near- and long-term impacts of the pandemic.

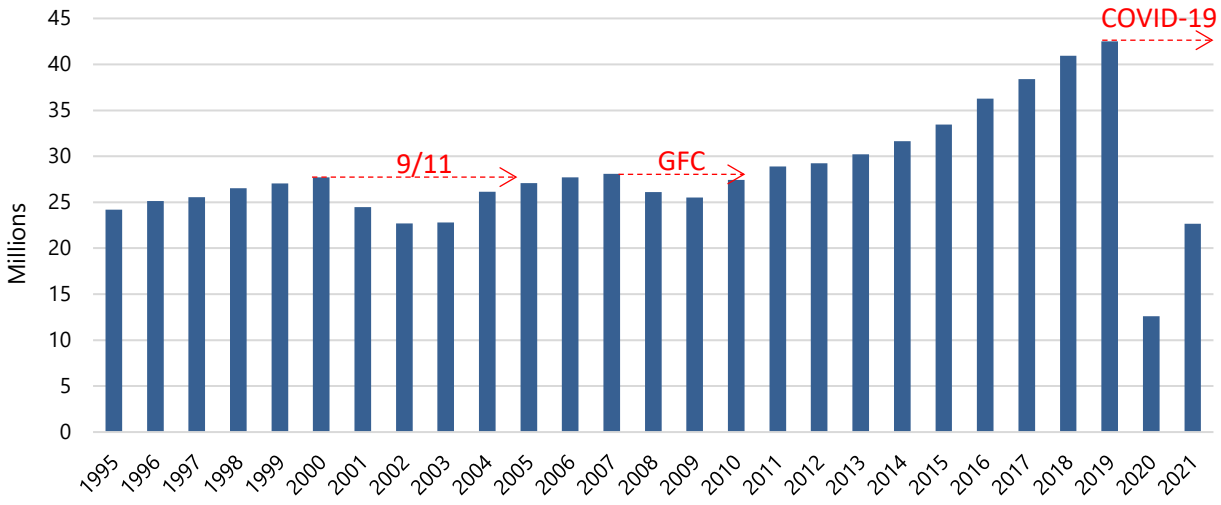


Source: Massport.

Notes: Logan Airport terminal (left) and baggage claim area (right) during the COVID-19 pandemic.

As a result of this significant reduction in Airport activity and dramatic reduction in revenues, both Massport, the airlines, and other tenants necessarily adjusted and scaled back their operations in 2020 and 2021. In response, a number of Airport projects and programs have been revised and pushed back. To be as transparent as possible, Chapter 3, *Airport Planning* includes the most current project updates through September 2022. Forthcoming EDRs and Environmental Status and Planning Reports (ESPRs) will continue to provide updates, as available. Overall, Massport continues to evaluate and plan for the recovery of aircraft operations and air passenger activity and remains committed to implementing the broad range of environmental and operating strategies designed to reduce the impacts associated with Airport operations.

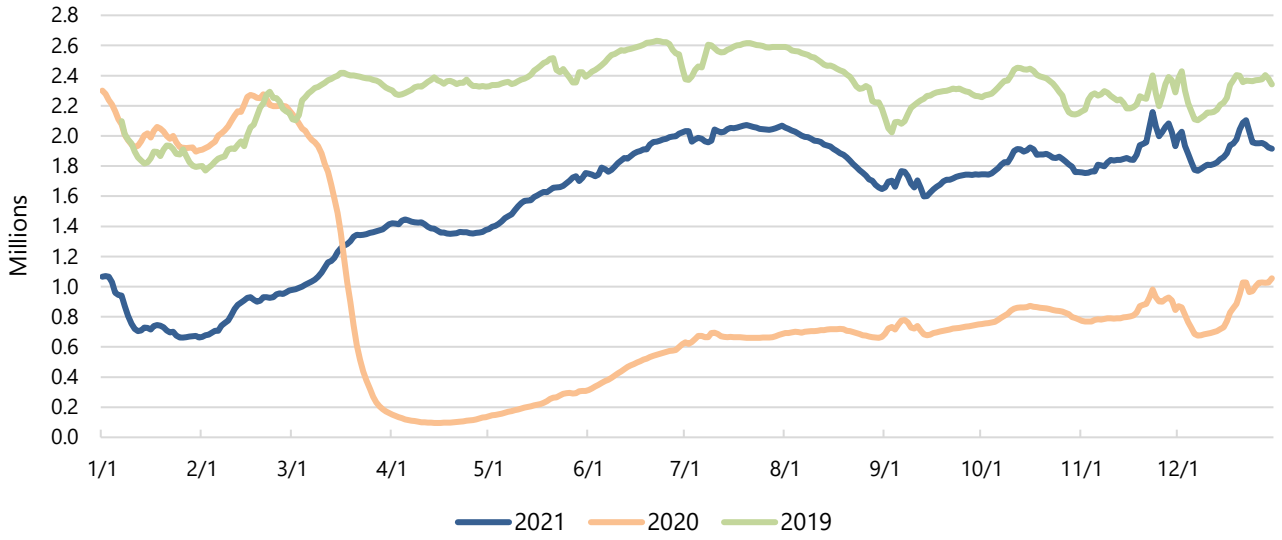
Figure 1-1 Logan Airport Recovery Pattern from External Shock Events



Source: InterVISTAS; Massport traffic statistics.

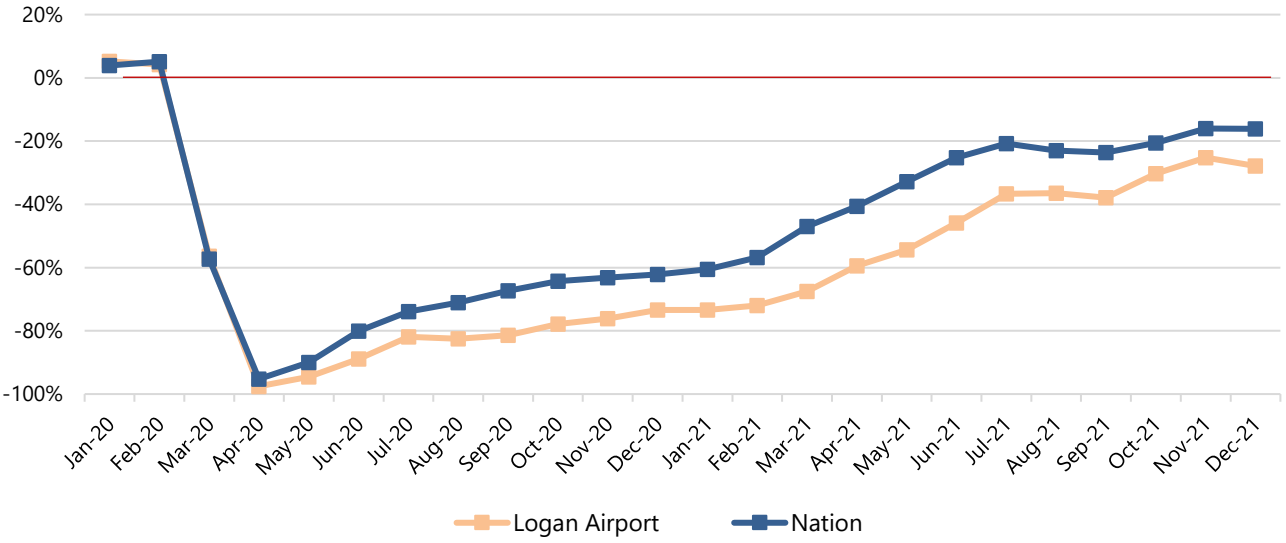
GFC - Global Financial Crisis (Great Recession).

Figure 1-2: Seven Day Average Transportation Security Administration (TSA) Throughput at U.S. Airports, 2019 through 2021



Source: TSA Daily Reports.

Figure 1-3: January 2020 to December 2021 Monthly TSA Throughput Compared to 2019



Source: TSA Daily Reports.

Logan Airport, owned and operated by Massport, plays a key role in the metropolitan Boston and New England passenger and freight transportation networks; it is the primary airport serving the Boston metropolitan area, the principal New England airport for long-haul services, and a major U.S. international gateway airport for transatlantic services. The Airport boundary encompasses about 2,400 acres in East Boston and Winthrop, including about 700 acres in Boston Harbor. Logan Airport's airfield comprises six runways, about 15 miles of taxiway, and about 240 acres of concrete and asphalt apron. Logan Airport has four interconnected passenger terminals (Terminals A, B, C, and E), each with its own ticketing, baggage claim, and ground transportation facilities. The Airport is less than a three-mile drive from downtown Boston and is accessible by public transit lines, several direct bus lines, and a well-connected roadway system. Massport provides Logan Express bus service to and from Logan Airport for air passengers and employees from a series of park-and-ride lots.

This *2020/2021 EDR* is one in a series of annual environmental review documents submitted to the Secretary of EEA, in accordance with the Massachusetts Environmental Policy Act (MEPA).[1] Since 1979, Massport has submitted these documents to report on the cumulative environmental effects of Logan Airport's operations and activities. Logan Airport is the first airport in the nation for which an annual environmental assessment on airport activities was prepared, and Massport continues to be a leader in environmental reporting.

Approximately every five years, Massport prepares an ESPR, which provides a historical and prospective view of Logan Airport. EDRs, prepared annually in the intervals between ESPRs, provide a historical review of environmental conditions for the reporting year compared to the previous year. This *2020/2021 EDR* follows the *2018/2019 EDR* which reported on 2018 and 2019 conditions. The last ESPR used 2017 as its base year. While Massport and the entire aviation industry continue to adjust to the evolving operating conditions, we continue to evaluate the pandemic's current and future impacts. Where possible, this EDR includes relevant information and updates. However, more detailed projections and analyses will be addressed in the forthcoming *2022 ESPR*.

At the request of the Secretary following her review of the *2018/2019 EDR*, Massport was directed to prepare this combined *2020/2021 EDR* and its scope was established by the Secretary's Certificate on the *2018/2019 EDR* dated March 19, 2021, which is included in Appendix A, *MEPA Certificates and Responses to Comments*. This EDR fulfills all requirements laid out in the Secretary's Certificate on the *2018/2019 EDR*, includes responses to comments on the Secretary's Certificate, and updates and compares the data presented in the *2018/2019 EDR* for the following subjects:

- Activity Levels (including aircraft operations, passenger activity, and cargo volumes)
- Air Quality/Emissions Reduction
- Logan Airport's Role in the Regional Transportation Network
- Ground Access to and from the Airport
- Noise Abatement
- Airport Planning (including activities underway and upcoming projects)
- Water Quality/Environmental Compliance
- Sustainability and Resiliency
- Environmentally Beneficial Measures and Mitigation Commitments

1 Massachusetts General Laws Chapter 30, Sections 61-62H. MEPA is implemented by regulations published at 301 Code of Massachusetts Regulations (CMR) 11.00 ("the MEPA Regulations").

To enhance the usefulness of this EDR as a reference document for reviewers, this report also presents historical data on the environmental conditions at Logan Airport dating back to 1990, in instances where historical information is available. When appropriate and available, this EDR also includes updates through fall 2022.

This EDR includes a Spanish translation of this chapter. This translated version is included after the English version of the Executive Summary.

EEA # 3247

Submitted By

Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston, MA 02128

Stewart Dalzell,
Deputy Director - Environmental Planning & Permitting
Strategic & Business Planning
(617) 568-3524

Brad Washburn,
Manager - Environmental Planning & Permitting
Strategic & Business Planning
(617) 568-3546

Logan Airport Environmental Review Process

This *2020/2021 EDR* is Massport's next filing in its unique, but well-established, formal state-level environmental review process that assesses Logan Airport's cumulative environmental impacts. The documents provide a current and historical context against which individual projects at Logan Airport meeting state and federal environmental review thresholds are evaluated on a project-specific basis. The Airport-wide and project-specific environmental review processes are described below.

Historical Context for the Logan Airport EDR/ESPR Process

In 1979, the Secretary of EEA issued a Certificate requiring Massport to define, evaluate, and disclose every three years the impact of long-term growth at the Airport through a Generic Environmental Impact Report (GEIR). The Certificate also required interim Annual Updates to provide data on conditions for the years between GEIRs. The GEIR evolved into an effective planning tool for Massport and provided projections of environmental conditions so that the cumulative effects of individual projects could be evaluated within a broader context.

EEA eliminated GEIRs following the 1998 revisions to its MEPA regulations. However, the Secretary's Certificate on the 1997 Annual Update[2] proposed a revised environmental review process for Logan Airport resulting in Massport's preparation of subsequent EDRs/ESPRs. The more comprehensive ESPRs provide a long-range analysis of projected operations, passengers, and cumulative impacts, while EDRs are prepared annually to

2 Certificate of the Secretary of the Executive Office of Environmental Affairs on the Logan Airport 1997 Annual Update, issued on October 16, 1998.

provide a review of environmental conditions for the reporting year compared to the previous year. The EDR/ESPR process was developed to allow individual projects at Logan Airport to be considered and analyzed in the broader, Airport-wide context. As stated in the introduction to the *1999 ESPR*, "while the Logan ESPR and EDRs provide the broad planning context for projects proposed for Logan Airport and future planning concepts under consideration by Massport, no specific projects can be built solely on the basis of inclusion and discussion in the *1999 ESPR*." It continues to state that projects that meet MEPA or National Environmental Policy Act (NEPA) review thresholds must undergo those processes, as needed. In short, the EDRs/ESPRs provide a cumulative planning context which complements the individual project-specific filings.

In 2018 and 2019, while passenger levels experienced significant growth, reaching new peaks, aircraft operations and associated environmental effects remained well below levels previously analyzed for Logan Airport. Thus, the forecasted aviation growth presented in the *2004 ESPR*, the predicate upon which the ESPR schedule was initially established, has not occurred. Accordingly, with the approval of the Secretary, Massport prepared *2009* and *2010 EDRs* in lieu of the ESPR originally planned for 2009. The *2011 ESPR*, filed in early 2013, reported on calendar year 2011 and updated passenger activity level and aircraft operations forecasts. The combined *2012/2013 EDR* presented conditions for both calendar years 2012 and 2013. The *2014 EDR*, *2015 EDR*, and *2016 EDR* presented conditions for calendar years 2014, 2015, and 2016, respectively. Similarly, with strong passenger growth and evolving ground access trends with the emerging RideApp industry (formerly referred to as transportation network companies [TNCs]), EEA allowed Massport to defer the *2016 ESPR*.

The *2017 ESPR* provided a comprehensive, cumulative analysis of activity levels and environmental conditions for 2017 and a Future Planning Horizon. In the ESPR, Massport proposed preparation of a combined *2018/2019 EDR* to report the effects of all Logan Airport activities based on actual passenger activity and aircraft operations in 2018 and 2019. As noted above, due to the COVID-19 pandemic, the Secretary required Massport file a combined *2020/2021 EDR* to begin to evaluate post-pandemic growth trends.

While this report is largely focused on 2020 and 2021, Massport has noted preliminary recovery highlights that will be further evaluated in the *2022 ESPR*. Where appropriate, Massport will continue to identify and address any longer-term aviation and environmental trends in both EDRs and ESPRs.

Project Specific Review

While this Airport-wide review provides the broad planning context for proposed projects and future planning concepts, certain Airport projects are also subject to a project-specific, public environmental review process when they meet state environmental review thresholds. When required, Massport and Airport tenants submit Environmental Notification Forms (ENFs) and Environmental Impact Reports (EIRs) pursuant to MEPA. Similarly, where NEPA[3] environmental review is triggered, projects are reviewed under the NEPA environmental review process.

Massport understands that MEPA amended its regulations under 301 CMR 11.00 as of December 24, 2021. Additionally, MEPA released the *MEPA Interim Protocol on Climate Change Adaptation and Resiliency,* effective for

3 42 USC Section 4321 et seq. The Federal Aviation Administration (FAA) implements NEPA through FAA Order 1050.1F, Environmental Impacts: Policies and Procedures, Federal Aviation Administration, United States Department of Transportation, Effective Date: July 16, 2015.

all new filings as of October 1, 2021, and the *MEPA Public Involvement Protocol for Environmental Justice Populations* and *MEPA Interim Protocol for Analysis of Project Impacts on Environmental Justice Populations,* effective for all new filings as of January 1, 2022. All projects at Logan Airport that are filed with MEPA will comply with these amended regulations and protocols. Future EDRs and ESPRs will document mitigation commitments from its projects that support these updates in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*.

Current and potential future projects anticipated to undergo MEPA and/or NEPA review are discussed in Chapter 3, *Airport Planning*.

2020/2021 EDR Outreach

Although EDRs and ESPRs are not projects subject to the *MEPA Public Involvement Protocol for Environmental Justice Populations,* Massport recognizes the importance of a robust outreach approach to ensure the public is aware of these reports and has an opportunity to review and comment. The distribution list for EDR and ESPR filings is routinely updated to include numerous organizations, residents, and agencies that have expressed interest in these reports. Additionally, this Executive Summary has and will continue to be translated in Spanish.

However, in light of the *MEPA Public Involvement Protocol for Environmental Justice Populations*, Massport has embarked on an expanded outreach process for this *2020/2021 EDR*, and intends to continue further developing its outreach approach for future filings.

The following measures have been implemented for this filing:

- Post a social media announcement notifying the public of upcoming filing.
- Circulate the *2020/2021 EDR* electronically to the Environmental Justice (EJ) Reference List provided by MEPA for Massport's recent Runway 9-27 Runway Safety Area Improvement Project.
- Include a reference in this Executive Summary, the cover letter, and the Notice of Availability that was sent to reviewers, that this Executive Summary is available in other languages upon request.
- Translate the Notice of Availability into Spanish.
- Translate the Executive Summary into Spanish.
- Post *2020/2021 EDR* on Massport's website at the time of filing with MEPA, allowing for approximately an additional week of review time.
- Prepare and post on Massport's website (https://www.massport.com/massport/about-massport/project-environmental-filings/logan-airport/) fact sheets in English and Spanish that will be available during the *2020/2021 EDR* comment period.

This Executive Summary is available in other languages upon request.

Please contact Brad Washburn at 617-568-3546 or Bwashburn@massport.com.

Additionally, Massport recognizes the importance of ongoing engagement with the community and organizations. The following highlights a couple of these engagement efforts:

- Massport renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
- Massport supports, where possible, the Massport Community Advisory Committee (CAC). The Massport CAC is a state-legislated body that works with Massport on a range of Authority-wide topics, including environmental issues. Further information about the Massport CAC can be found at https://massportcac.org/.

Logan Airport Planning Context

Logan Airport plays a key role in the metropolitan Boston and New England passenger and freight transportation networks. The Airport is one of the most land-constrained airports in the nation and is surrounded on three sides by Boston Harbor (see **Figures 1-4** and **1-5**).

Passenger and Aircraft Activity Growth at Logan Airport

Consistent with the rest of the U.S. airport industry, Logan Airport experienced steep declines in airline activity and passenger volumes over the past two years. Different states and regions within the U.S. have differed in their response to COVID-19 restrictions which in turn reflected the willingness of consumers to resume travel to and from particular markets. The net result is that air travel recovery at Logan Airport continues to be a work in progress. Although 2020 passengers dropped to levels of activity not seen since the 1970s, in 2021 the Airport showed a gradual return towards 2019 levels (**Figure 1-6**). 2022 has shown further recovery, but not to pre-pandemic levels.

Starting in March 2020, Logan Airport experienced dramatic reductions in passenger levels and flights, associated with the COVID-19 pandemic. Passenger activity levels totaled approximately 12.6 million in 2020, a decrease of 70.3 percent compared to 2019 levels. The total number of aircraft operations at Logan Airport declined by 51.6 percent, from 427,176 operations in 2019 (which was a historic peak since 2001) to 206,702 operations in 2020.

In 2021, the Airport continued its recovery path, and added 10.0 million passengers, ending the year with about 22.7 million, recovering to approximately 53.3 percent of 2019 passenger levels. 2021 operations increased to 266,034 operations, representing a recovery of 62.3 percent of 2019 levels.

FIGURE 1-4 Aerial View of Logan Airport

2020/2021 Environmental Data Report

0 450 900 1800 Feet

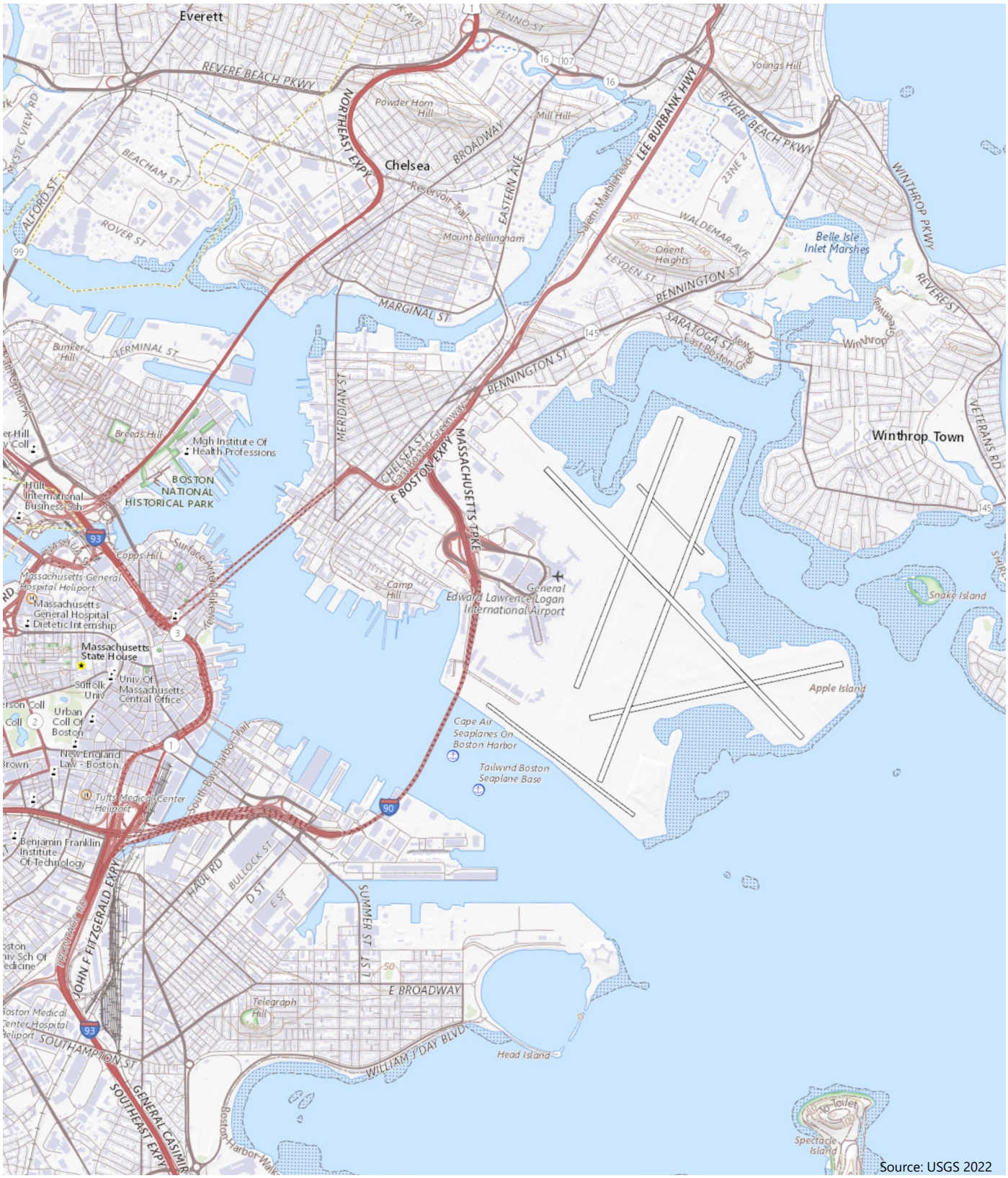
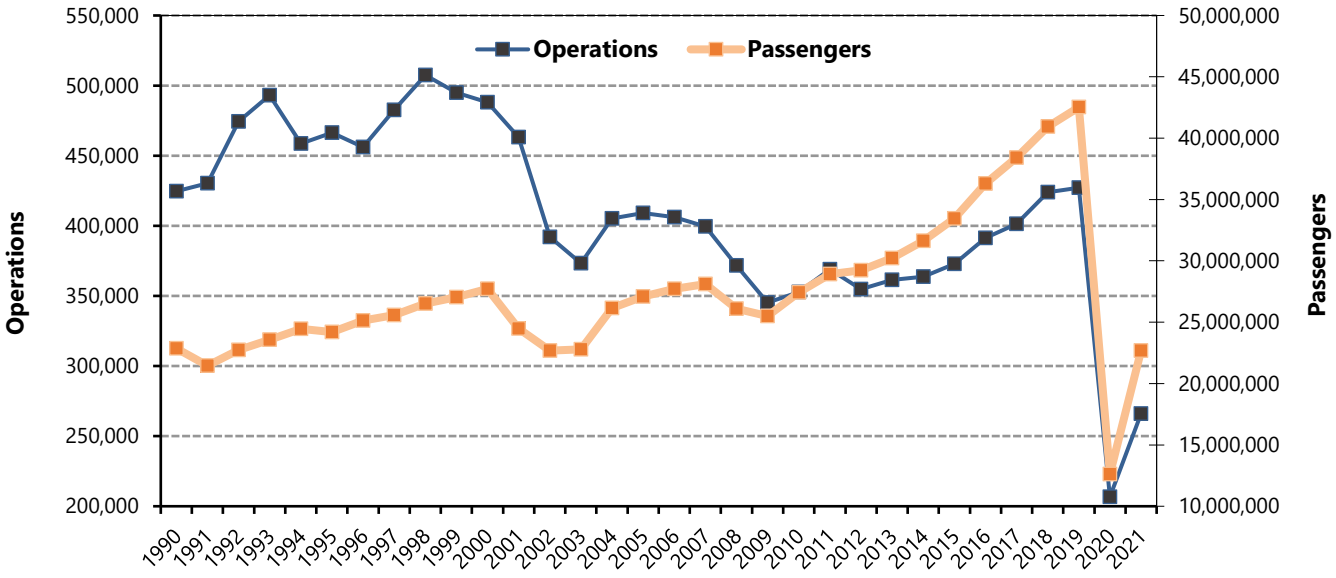


FIGURE 1-5 Logan Airport and Environs

Figure 1-6 Logan Airport Annual Passenger Levels and Aircraft Operations (1990–2021)



Logan Airport Activity Levels are Closely Tied to the Regional and National Economy

Activity levels at Logan Airport are largely driven by the local, regional, and national economies. As can be seen by looking at long-term trends, it is clear that when the economy is strong, Logan Airport grows. Similarly, the most significant declines in passenger levels and aircraft operation track closely with significant national and international disruptions. Examples of the most significant declines include the Professional Air Traffic Controllers Organization (PATCO) strike in 1981, September 11, 2001, the Great Recession in 2008/2009, and now the COVID-19 pandemic.

When there has been significant growth, as was observed through 2018 and 2019, Massport has implemented strategies to address that growth in a manner that allows Logan Airport to evolve in a sustainable and environmentally responsible way.

Logan Airport is the largest airport in the six-state New England region, which has a population of approximately 15.1 million residents in 2021. The Airport is located in Massachusetts, which is home to approximately 7.0 million residents, or nearly 46.6 percent of New England's population as of 2021. Logan Airport serves passengers from across New England, with its primary catchment area consisting of five Massachusetts counties: Essex, Middlesex, Norfolk, Plymouth, and Suffolk (which includes the City of Boston). According to the most recently available statistics, 4.4 million people reside in this five-county area.

Prior to COVID-19, the Boston metropolitan area had consistently maintained a lower unemployment rate compared to the Commonwealth and the nation. In 2019, the Boston metropolitan statistical area had an unemployment rate of 2.8 percent, which was lower than both the rate in the Commonwealth (3.1 percent) and the country (3.7 percent). Even during the 2008/2009 economic downturn, Boston and the Commonwealth experienced unemployment rates below the national average.[4] Massachusetts recorded a recent historical high unemployment rate of 16.7 percent in April 2020, which was greater than the national unemployment rate of 14.4 percent the same month.[5] After reaching record-high unemployment rates at the height of the pandemic in 2020, the Commonwealth's unemployment rate continued to fall steadily in the remaining months of 2020 and through 2021, falling to 4.1 percent in December 2021. The Airport not only serves a growing population, but a high earning one as well. Per capita income in 2020 was estimated at $85,724 (current U.S. dollars) in the Airport's primary service area, 11.3 percent higher than the Commonwealth and 44.9 percent higher than the national average.[6]

Logan Airport is a key transportation and economic resource in the New England region, the state, and the Boston metropolitan area, which is home to a broad range of industries and with a relatively wealthier population when compared to the U.S. average. The industries accounting for the largest share of employees include healthcare and social assistance;[7] educational services; and professional, scientific, and technology services (which include Boston's growing biotech industry).[8] In 2019, Boston/Cambridge, the nation's largest biopharma cluster, committed to advancing digital health through creation of a digital health record database where the industry is expected to grow to generate more than $350 billion in annual value by 2025.[9] Even during the height of the global pandemic that caused an economic downturn in other business sectors, the Commonwealth's biopharma industry continued to thrive, adding about 85,000 jobs and raising over $5.8 billion in venture capital.

In addition to supporting the growth and economic success of the state, Logan Airport and the airport industry have always been important elements in the state and regional economies. The *Massachusetts Statewide Airport Economic Impact Study Update,* completed by the Massachusetts Department of Transportation (MassDOT) in 2014 and most recently updated in 2019,[10] estimates that Massport airports – inclusive of Logan Airport, Worcester Regional Airport, and Hanscom Field – contribute approximately $23.1 billion in output to the Massachusetts economy annually; of this output, 71 percent is due to Logan Airport alone.[11] Total output includes on-Airport businesses, construction, visitor, and multiplier effects

4 U.S. Bureau of Labor Statistics. 2020.

5 U.S. Bureau of Labor Statistics.

6 U.S. Department of Commerce, Bureau of Economic Analysis. Latest data for metropolitan statistical area was 2020.

7 The Social Assistance subsector of the North American Industry Classification System and includes Individual and Family Services; Community Food and Housing, and Emergency and Other Relief Services; Vocational Rehabilitation Services; and Child Day Care Services. U.S. Bureau of Labor Statistics. 2019. Industries at a Glance – Social Assistance: NAICS 624. https://www.bls.gov/iag/tgs/iag624.htm.

8 U.S. Census Bureau via DataUSA. 2019. Boston-Cambridge, Newton, MA-NH Metro Area profile. www.datausa.io

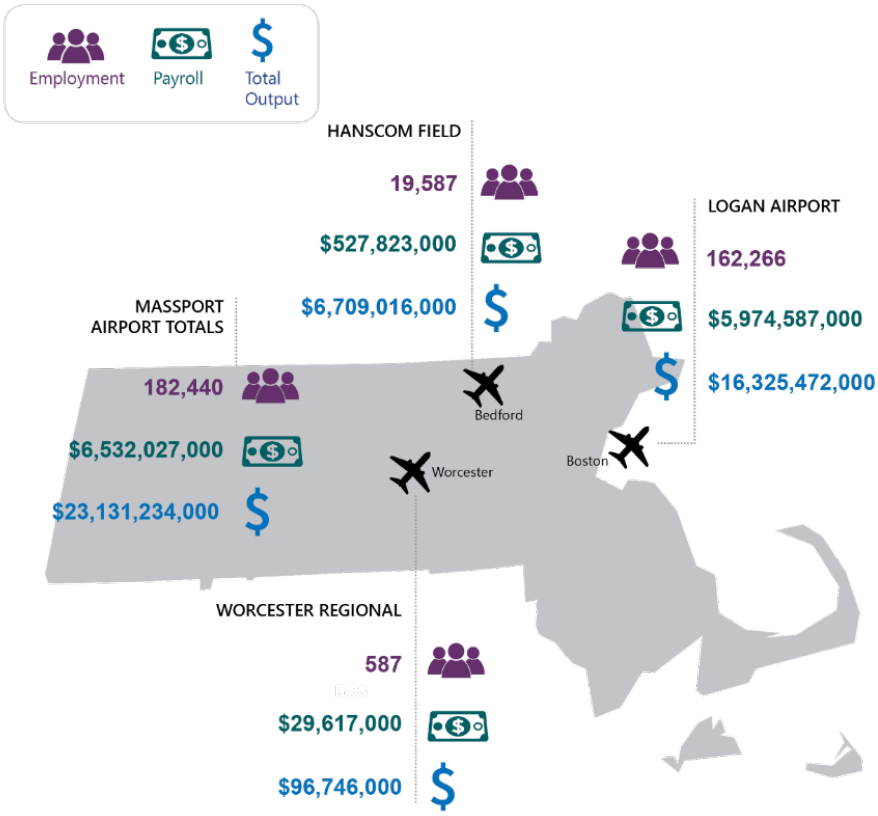
9 Massachusetts Biotechnology Council (MassBio) conference; McKinsey estimate "The Era of Exponential Improvement in Healthcare" https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/the-era-of-exponential-improvement-in-healthcare.

10 MassDOT Aeronautics Division. 2019. *Massachusetts Statewide Airport Economic Impact Study Update*. https://www.mass.gov/doc/aeronautics-economic-impact-study-2019/download.

11 *Ibid*.

(see **Figure 1-7**).[12] Logan Airport supports over 162,000 direct and indirect jobs, while generating approximately $16.3 billion per year in total economic output.[13]

Figure 1-7 Total Economic Impact of Massport Airports



Source: MassDOT, Massachusetts Statewide Airport Economic Impact Study Update, 2019.
Notes: "Massachusetts Totals" refers to the total economic output of all Massachusetts airports.

Logan Airport is considered an origin and destination (O&D)[14] airport both nationally and internationally, meaning that approximately 90 percent of Logan Airport passengers' trips either start or end at Logan Airport. Hub airports, such as Atlanta or Chicago, serve many more passengers annually but, compared to O&D airports like Logan Airport, a higher percentage of passenger traffic at hub airports passes through to connecting flights. Logan Airport is considered a domestic and international O&D airport, meaning that less than 10 percent of air passengers are connecting through Logan Airport.

12 Multiplier effects refer to the recirculation of money in the local economy after initially being spent by the Airport, its tenants, or tourists. This recirculation increases the overall impact of the Airport's operation in the local economy.

13 MassDOT Aeronautics Division. 2019. *Massachusetts Statewide Airport Economic Impact Study Update.* https://www.mass.gov/files/documents/2019/03/25/AeroEcon_ImpactStudy_January2019.pdf.

14 "Origin and destination" traffic refers to the passenger traffic that either originates or ends at a particular airport or market. A strong O&D market like Boston generates significant local passenger demand, with many passengers starting their journey and ending their journey in that market. O&D traffic is distinct from connecting traffic, which refers to the passenger traffic that does not originate or end at the airport but merely connects through the airport en route to another destination.

Forecast Status

The *2017 ESPR* presented an updated forecast for Logan Airport aircraft operations and passenger activity. That forecast focused on a Future Planning Horizon including a projected 50 million annual air passengers and 486,000 annual aircraft operations. Massport's ESPR forecast was consistent with the Federal Aviation Administration's (FAA's) Terminal Area Forecast at that time. However, the COVID-19 pandemic has dramatically reduced air passenger traffic in 2020 and 2021, with a return to 2019 levels not expected in the near term.

Due to the strong economy in the months prior to the start of the COVID-19 pandemic, passenger activity levels and aircraft operations at Logan Airport increased rapidly. That growth was largely driven by the positive economic conditions in the Boston region, low unemployment, a strong, diverse economic base, and continued investment in commercial and residential real estate, particularly in life sciences, finance, healthcare, and higher education. As with other airports across the U.S., this growth trend was upended in March 2020 at the start of the pandemic.

Accordingly, the *2017 ESPR* projections will need to be updated as the longer-term impacts of the COVID-19 pandemic are better understood. The methodology for the upcoming *2022 ESPR* forecasts will be prepared using standard industry forecasting techniques, which include analyzing:

- Historical patterns of airport traffic and airfares;
- Historical socioeconomic and demographic data;
- Airline strategies and industry trends; and
- Forecasted socioeconomic and demographic data.

This methodology is similar to that used by the FAA to develop the Terminal Area Forecast.

The forecast will be developed using a combination of both a bottom-up (short term) microeconomic methodology and a top-down macroeconomic methodology. The bottom-up forecast includes a review of recent industry trends and expectations of future airline service and schedule data. It will incorporate airline input regarding short-term capacity recovery from COVID-19 as well as input from industry trade groups such as Airlines For America (A4A), the International Air Transport Association (IATA), and Airports Council International (ACI). These industry groups provide important context into the recovery at gateways markets such as Boston, compared to domestic and regional markets.

Statistical analyses of the relationship between historical demand and local and national economic conditions will inform the top-down, longer-term forecast. Previously, econometric factors such as U.S. Gross Domestic Project (GDP), regional GDP, regional total personal income, and the cost of fuel served as representative independent variables in the regression analysis. Given Boston's market size and strong economy, these factors may be used again in the *2022 ESPR* aviation demand forecasts.

It is also important to note that given Logan Airport's position in the northeast regional market, the trends and market dynamics at other nearby airports such as Manchester-Boston Regional Airport (MHT) and Rhode Island T.F. Green International Airport (PVD) will also be considered.

Massport Investment in Logan Airport

Massport constantly monitors, evaluates and implements enhancements to Logan Airport's safety, security, operational efficiency, and accessibility to and from the Boston metropolitan area, while carefully monitoring the environmental effects of Logan Airport operations. Recent and ongoing terminal area projects are aimed at providing seamless post-security connectivity among the terminals along with enhancements to passenger processing through consolidated security checking areas. Access to and around Logan Airport also remains a priority. Massport continues to work with FAA to enhance airside safety through a variety of runway safety area (RSA) improvements and simplification of the airfield geometry.

As noted above, the impacts of the COVID-19 pandemic have precipitated a wide range of changes at Logan Airport. Both the drop in passengers and associated revenues in 2020 and 2021 required significant adjustments to services and project schedules. Massport has focused on adjusting services to match the shifting passenger levels and ensure that those changes are made with careful consideration of managing environmental and operating impacts. In some areas, programs have been adjusted to reflect current needs and impacts. Massport remains committed to implementing project-related mitigation strategies, as documented in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*.

2020 and 2021 Highlights and Key Findings

This section provides a brief overview of key findings, by chapter, at Logan Airport in 2020 and 2021. Additional information concerning Airport activities is provided in subsequent chapters. This section also highlights Massport's efforts to further sustainability through specific projects and initiatives with a **sustainability leaf** and summarizes Massport's sustainability program.

The Secretary's Certificate on the *2018/2019 EDR*, which formed the Scope of this *2020/2021 EDR*, acknowledged that activity levels and operations have decreased due to the COVID-19 pandemic. Given the anomaly of this reporting timeframe, MEPA directed that a combined 2020 and 2021 EDR be filed to provide a clearer indication of post-pandemic growth trends, along with a methodology for the forthcoming future forecast.

As of the filing of this *2020/2021 EDR*, Logan Airport continues to recover from reduction in demand from the COVID-19 pandemic. The effects of COVID-19 on the aviation industry and Logan Airport continue to evolve. As a result, the *2022 ESPR* will provide an updated forecast, reflecting continuing recovery from the pandemic as well as industry changes that are reshaping aviation in the U.S. and internationally.

Activity Levels

Until the onset of the COVID-19 pandemic, Logan Airport (and the aviation industry in general) had been experiencing strong growth, largely driven by the positive economic conditions in the Boston region, low unemployment, a strong, diverse economic base, and continued investment in commercial and residential real estate, particularly in life sciences, finance, healthcare, and higher education. Due to the COVID-19 pandemic, 2020 passenger levels and operations have dramatically decreased, with 2021 passenger levels showing a gradual return towards 2019 levels.

Consistent with the rest of the U.S. airport industry, Logan Airport experienced steep declines in airline activity and passenger volumes over the past two years. Different states and different regions within the U.S. have differed in their response to COVID-19 restrictions which in turn reflected the willingness of consumers to resume travel to and from particular markets. The net result is that air travel recovery at Logan Airport is a work in progress. Logan Airport has been recovering at a slower rate when compared to the overall U.S. scheduled passenger recovery, which recovered 72.7 percent of its 2019 levels in 2021.[15] Prior to the pandemic, Logan Airport had been averaging an annual passenger growth of 5.1 percent since 2014, and was previously outpacing the overall U.S. passenger growth of 4.0 percent per year for the same time period.

In 2020, the domestic passenger market declined by 68.5 percent to 10.7 million compared to 2019 but rebounded in 2021 to 20.0 million passengers compared to 2020, which represents about 58.8 percent of 2019 annual domestic passenger levels. Although domestic passenger activity reached a record peak of 34.1 million in 2019, 2021 domestic passenger activity levels were below levels seen prior to 1998.

The total number of aircraft operations at Logan Airport declined by 51.6 percent, from 427,176 operations in 2019, which was a historic peak since 2001, to 206,702 operations in 2020. Operations then increased in 2021 to 266,034 operations, representing a recovery of 62.3 percent of 2019 levels.

Please see Chapter 2, *Activity Levels,* for additional information.

Airport Planning

Massport is continually improving the facilities at Logan Airport to accommodate changes in passenger demand, aircraft activity, cargo needs, and transportation access. In Chapter 3, *Airport Planning*, Massport has identified priority planning projects and initiatives in the following categories:

- Ground Transportation and Parking;
- Terminals;
- Airside Planning;
- Service Areas;
- Airport Buffers and Open Space; and
- Energy, Sustainability, and Resiliency.

As a result of this significant reduction in Airport activity and dramatic reduction in revenues through 2020 and 2021, Massport, airlines, and other Logan Airport tenants necessarily adjusted their operations. The schedule for a number of Massport's and tenant Airport projects and programs were also adjusted. Massport continues to review the status of its projects/programs, and additional changes or deferments continue to occur in response to activity levels and revenues. Of particular note is careful and continuing review of Logan's ground access programs to remain aligned with ridership levels and long-standing high-occupancy vehicle (HOV) transportation services. Despite these challenges, Massport remains committed to implementing project-related mitigation strategies.

15 Bureau of Transportation Statistics. https://www.bts.gov/covid-19.

Several projects aimed at providing on-Airport roadway congestion relief are ongoing and are expected to be complete by summer 2023, namely:

- On-Airport roadway improvements to enhance efficiency and reduce congestion,
- Roadway and curb improvements in front of Terminal C (Arrival and Departure levels) to reduce peak hour congestion and prioritize HOV access,
- Relocation of the RideApp traffic for Terminal B from the Central Garage to the Departures level of Terminal B,
- Construction of roadways exiting the Terminal B departures level that will allow traffic to exit in its own lane, rather than merging with traffic destined for Terminals C and E,
- Installation of a tunnel exiting the Terminal B garage that will allow traffic to exit in its own lane on the Arrivals level, rather than merging with traffic destined for Terminals C and E, and
- Improvements to the roadways connecting Terminals B and C to improve circulation, reduce congestion, and improve safety.

Recent and ongoing terminal area projects are providing seamless post-security connectivity and flexibility among the terminals along with enhancements to passenger processing through consolidated security checking areas.

To enhance the on-Airport roadway network, Massport is improving several of the terminal area roadway segments and intersections. In December 2019, Massport relocated most RideApp drop-off and pick-up areas in the Central Garage.

Since filing the *2018/2019 EDR*, Massport has completed state and/or federal environmental review of several projects:

- **Logan Airport Parking Project**, which will add 5,000 commercial parking spaces at Logan Airport in locations already in use for parking. The additional parking spaces respond to the MassDOT and U.S. Environmental Protection Agency (EPA)'s approval of a modification to the regulatory Logan Airport Parking Freeze.[16] The additional spaces are intended to reduce environmentally harmful drop-off/pick-up modes (i.e., dropped off or picked up by private vehicles, taxi, RideApp, or black car limousine service). The joint MEPA/NEPA review process was completed in January 2020. This project is currently deferred due to the reduction in passenger activity associated with the COVID-19 pandemic.
- **Terminal C Canopy, Connector and Roadway Project** received federal environmental approval under NEPA in November 2018. As described in the *2017 ESPR*, construction of this project will replace and reconfigure sections of the elevated roadways connecting Terminals B and C. Construction of the replacement canopy was completed in 2021, with a slightly reduced program than originally planned. The Terminal C to B Connector was completed in 2022 and roadways are anticipated to be complete in summer 2023.
- **Runway 9-27 RSA Improvement Project**, which includes construction of a deck with an Engineered Materials Arresting System (EMAS) on the end of Runway 27, to meet FAA safety

16 310 Code of Massachusetts Regulations 7.30 and 40 Code of Federal Regulations 52.1120.

requirements. In August 2021, an ENF was filed with the MEPA Office. The Draft Environmental Impact Report (DEIR) was filed in June 2022. As of this filing, work on the Final EIR (FEIR) and NEPA documentation is underway.

Please see Chapter 3, *Airport Planning,* for additional information.

Regional Transportation

In 2020, air passenger activity in the New England region declined significantly with some recovery in 2021. By year-end 2021, regional air passengers recovered to about 56 percent of 2019 levels. Prior to the pandemic, nearly 60 million air passengers flew through the New England system in 2019, a historic high. The 10 regional airports (excluding Logan Airport) in New England accommodated approximately 6 and 11 million air passengers in 2020 and 2021, respectively, compared to approximately 17.2 million passengers in 2019.

In 2021, Bradley International (BDL), Rhode Island T.F. Green International (PVD), Portland International Jetport (PWM), Bangor International (BGR), Manchester-Boston Regional (MHT), Worcester Regional (ORH), and Hanscom Field (BED) recovered between approximately 80 to 100 percent of their 2019 total aircraft operations. Whereas, Tweed-New Haven (HVN), Burlington International (BTV), and Portsmouth International (PSM) airports exceeded 2019 operation levels, fueled in part by charter and general aviation (GA) activity growth. Commercial passenger service recovery continues to lag at all regional airports, however, several airports welcomed new entrant services in 2020 and 2021 offered by low-cost and ultra-low-cost carriers such as Allegiant Air, Avelo Airlines, Breeze Airways, Frontier Airlines, and Sun Country Airlines.

According to the latest statewide airport economic impact study from 2019, Massport's three airports, Logan Airport, Worcester Regional Airport, and Hanscom Field, made significant contributions to the regional economy, generating approximately $23.1 billion annually, or 94 percent of the overall economic benefits generated by the Massachusetts' airport system.[17] Hanscom Field is a reliever airport to Logan Airport and is the second busiest airport in New England.

Passenger activity levels at Worcester Regional Airport declined by approximately 78 percent in 2020 compared to 2019, followed by further decline in 2021 when all commercial traffic was temporarily suspended. Altogether, Worcester Regional Airport has reported a total of nearly 890,000 cumulative passengers since 2013 when it re-introduced commercial services. jetBlue Airways, American Airlines, and Delta Air Lines have resumed nonstop flights to the majority of its pre-pandemic served destinations as of the end of 2021. Massport continues to invest in Worcester Regional Airport—together with the City of Worcester, Massport has already initiated a $100 million, 10-year investment to revitalize and attract commercial operations to Worcester Regional Airport. In November 2022, Massport celebrated the 1 millionth passenger to use Worcester Regional Airport since the resumption of passenger service in 2013.

In response to COVID-19, American Airlines, Delta Air Lines, and jetBlue Airways temporarily suspended service in and out of the Worcester Regional Airport between October 2020 and July 2021. By August

17 MassDOT Aeronautics Division. 2019. *Massachusetts Statewide Airport Economic Impact Study Update.* https://www.mass.gov/files/documents/2019/03/25/AeroEcon_ImpactStudy_January2019.pdf.

2021, Worcester Regional Airport welcomed back nonstop service to New York John F. Kennedy International Airport (JFK), which grew to twice daily by December 2021. jetBlue Airways also restarted operations to Fort Lauderdale in October 2021. American Airlines and Delta Air Lines re-commenced daily service to New York LaGuardia and Philadelphia, respectively, in November 2021. Although Delta Air Lines previously operated flights to its hub in Detroit prior to the pandemic, according to published OAG schedules,[18] no nonstop service between the two airports remains.

Amtrak rail system-wide ridership decreased from 16.8 million customer trips in fiscal year (FY) 2020 to 12.2 million trips in FY 2021. In FY 2020, the Northeast Corridor (NEC) carried approximately 6.1 million passengers, down approximately 51 percent from the prior year. In FY 2021, the NEC carried 4.4 million passengers on those services, down about 28 percent from the prior year.

Ground Access

Post pandemic, it is anticipated that Logan Airport will continue to be one of the leading airports in the United States in terms of HOV and transit mode share. Massport remains committed to promoting numerous HOV, transit, and shared-ride options to improve on-Airport roadway and curbside operations, alleviate constraints on parking, and improve customer service. Key findings from 2020 and 2021 are summarized in the bullets that follow and additional details can be found in Chapter 5, *Ground Access to and from Logan Airport*.

- Average weekday on-Airport vehicle miles traveled (VMT) decreased by about 75 percent from 2019 to 2020. Average weekday on-Airport VMT increased from 2020 to 2021. The change in average daily traffic in 2021 can be attributed primarily to a post lock-down rebound in air passenger activity, increase in passenger drop-off/pick-up, cargo, and non-aviation related Airport uses. Based on more recent data, Airport activity and on-Airport VMT is trending higher in 2022 due to the reduction in air travel restrictions and social distancing impacts of COVID-19.
- RideApp transactions dropped significantly from more than 7 million in 2019 to just over 2 million in 2020 due to travel restrictions from COVID-19 and potential health safety concerns associated with sharing vehicles. As passenger levels increased in 2021, the number of rideshare users also increased. However, the number of riders is still significantly lower than pre-COVID (2019 and prior) levels. Due to the impacts of COVID-19, the number of black car limousines and scheduled van seats coming to the Airport dropped by nearly 64 percent from 2019 to 2021. Taxi dispatches declined 80 percent in 2020 compared to 2019 but increased between 2020 and 2021. The Massachusetts Bay Transportation Authority (MBTA) Blue Line ridership decreased by approximately 58 percent between 2019 and 2020 and increased in 2021 compared to 2020.
- Massport has a goal of reaching 35.5 percent HOV mode share by 2022 and 40 percent by 2027. Based on the results of the *2019 Logan International Airport Air Passenger Ground-Access Survey*, HOV mode share reached 40.4 percent, exceeding both near-term and longer-term goals. COVID-19 has had a range of impacts on ground transportation, particularly on the use of ground-access HOV modes. While it is anticipated that the HOV mode share will drop as a result of COVID-19 over the short term, Massport remains committed to meeting the HOV mode share goals going forward. Results of the 2022 Air Passenger Ground-Access Survey will be presented in the *2022 ESPR*.

18 Published schedules as of September 2022.

Ground Access Strategy

Massport has a long-standing multi-pronged, trip reduction strategy to diversify and enhance ground transportation options for passengers and employees traveling to and from Logan Airport. The strategy is designed to offer passengers a choice of HOV, transit, and shared-ride options that are convenient and reliable, and that reduce environmental and community impacts.

Massport's strategy also aims to provide sufficient on-Airport parking for air passengers choosing automobile access modes and/or who have limited HOV options. In 2017, the Massachusetts Department of Environmental Protection (MassDEP) amended the Logan Airport Parking Freeze to allow for an increase of up to 5,000 on-Airport commercial parking spaces, which allows for the construction of additional parking to reduce the use of drop-off/pick up modes and alleviate constrained on-Airport parking conditions. In January 2020, Massport received the FEIR certificate from the Secretary of the EEA, completing the environmental review process for the construction of 5,000 additional parking spaces. While the project has completed the environmental review process, construction of these additional parking spaces has been deferred until passenger activity levels recover sufficiently. The *2022 ESPR* will provide an updated project status.

A long-standing Massport interest is addressing on-Airport roadway congestion with a combination of policy changes and infrastructure improvements. Alleviating terminal area congestion is important for continued safe and efficient landside operations and to reduce environmental impacts. Enhancing multimodal transportation options and providing modern, flexible infrastructure is one way an airport can reduce greenhouse gas (GHG) emissions and improve its environmental footprint.

Massport recognizes the importance of providing safe and reliable HOV services to and from the Airport and has a HOV mode share goal of reaching 40 percent by 2027. Understanding the growth in RideApp use and their impact on regional and terminal area roadway congestion is essential to managing on-Airport traffic volume and promoting HOV services as a viable and attractive alternative. To address congestion issues caused by RideApps prior to the pandemic, Massport reconstructed the ground floor of the Central/West garage to facilitate passenger drop-off (between the hours of 10:00 AM and midnight) and pick-up (all times). This service change was completed in December 2019.

During 2020 and 2021, the pandemic effects resulted in fewer passengers and employees traveling to and from Logan Airport and less roadway congestion both in Boston and the metropolitan area. In addition, the public's interest in using HOV transportation services like buses, rapid transit, and commuter rail, is still diminished by concerns about COVID-19, reduced service, or service disruptions. Within that context, Massport continues to evaluate and plan for the recovery of air passenger activity and remains committed to implementing the broad range of ground access and trip reduction strategies. Massport continues to carefully review both on and off-Airport activity levels and will adjust its ground access programs to align with air passenger levels. The schedule for HOV and ground access improvements have and will continue to be adjusted due to current conditions. Future EDRs and ESPRs will provide detailed updates on all service adjustments and activity levels.

Massport continuously evaluates its strategies and programs aimed at improving and, where needed, expanding HOV services to and from Logan Airport, including continued investment in Logan Express facilities and service. The initiatives described below can improve roadway operations as well as air quality emissions. The following measures have been implemented or remain under consideration:

- Continuing to promote Logan Express ridership by expanding parking, frequency, and facility upgrades.

- **Suburban Logan Express Service Enhancements**
  - Increase Braintree Logan Express service from two to three trips per hour (implemented in May 2019 but reduced to hourly service in March 2020 due to the impacts of COVID-19. In July 2021, service resumed to every half hour service).
  - Add about 1,000 additional spaces to the Framingham garage (permitting completed in 2020; however construction is deferred).
  - Marketing to support Logan Express strategy and increase ridership.
  - Implement Logan Express electronic ticketing (completed in March 2021).
  - Evaluate new Logan Express suburban locations, with a plan to open at least one new site. Peabody Logan Express relocated in February 2022. Massport is evaluating opportunities for further expansion of capacity and service.
  - Explore RideApp Last Mile connections.
  - Continue to monitor parking capacity at all Logan Express sites.

- **MBTA Silver Line**
  - Massport continues its partnership with the MBTA to offer free Silver Line boardings at the Airport. The reduced dwell times and faster travel times through the terminal area led Massport to extend the free-fare program indefinitely. Eight Silver Line buses purchased by Massport are operated by the MBTA with Massport paying operating costs for the Silver Line buses. In 2018, Massport funded mid-life rebuilds of four Silver Line buses. Massport will purchase eight new Silver Line buses as part of a forthcoming (2023) MBTA procurement.

- **Urban Logan Express Service**
  - Change pick-up/drop-off location from Copley to Back Bay Station (implemented in 2019).
  - Discount one-way fare from $7.50 to $3.00 (implemented in 2019).
  - Provide free service from Logan Airport (implemented in early 2019).
  - Provide security line priority status to Logan Express Back Bay riders (implemented in 2019; this service was temporarily suspended due to COVID-19, but restored in October 2022).
  - Marketing campaign to support increased ridership (ongoing).
  - Implement Logan Express electronic ticketing (implemented upon reopening in October 2022).
  - Explore a second urban Logan Express service.
- **RideApp Management Plan**
  - Facilitate rematch and shared ride by moving RideApp drop-off/pick-up activity to new dedicated areas in the Central Garage (complete).

  - Implement RideApp rematch[19] so drivers dropping off can more easily leave with a passenger (complete).
  - Introduce RideApp shared ride incentives to reduce RideApp vehicles through gateways by increasing vehicle occupancies (complete).
  - Adopt new RideApp fee structure to support HOV strategies, encourage shared rides, and reduce gateway congestion (complete).
  - Optimize RideApp operations on-Airport through data reporting, enforcement tools, and emerging RideApp products (continuing).
- **Infrastructure improvements**
  - Massport will continue to evaluate and identify the need for additional infrastructure modifications as a complement to policy changes to allow terminal area roadways and curbsides to continue functioning adequately and minimize vehicle idling and associated emissions. Changes will be implemented as needed.

Noise

Massport strives to minimize the noise effects of Logan Airport operations on its neighbors through a variety of noise abatement programs, procedures, studies, and other tools. At Logan Airport, Massport implements one of the oldest and most extensive noise abatement programs of any airport in the nation. Massport's comprehensive noise abatement program includes a dedicated Noise Abatement Office; a state-of-the-art Noise and Operations Monitoring System (NOMS); extensive residential and school sound insulation programs; time-of-day and runway restrictions for noisier aircraft; ground run-up procedures; and flight tracks designed to optimize over-water operations (especially during nighttime hours). The public can register noise complaints by phone or online through Massport's website.[20]

Key findings are summarized in the bullets that follow and additional details can be found in Chapter 6, *Noise Abatement*.

- Massport continues to seek funding for noise mitigation of properties that are eligible to participate in its Residential Sound Insulation Program (RSIP). In 2021, Massport updated its Noise Exposure Map (NEM) and is initiating a new program to sound insulate eligible homes and re-evaluate sound insulation in homes treated prior to 1993. To date, Massport has provided sound insulation for a total of 36 schools and 11,515 residential units with over $170 million invested since the start of the program.
- Massport is currently working with FAA to possibly address issues with the first-generation sound insulation windows. In January 2020, Massport's Chief Executive Officer (CEO) sent a letter to the FAA Associate Administrator requesting that Massport and FAA work together to address re-treatment of homes that were sound insulated during the early years of the program to upgrade eligible homes to newer, more effective and durable materials. The Associate Administrator responded that FAA is exploring limited circumstances under which Massport might be able to

19 Rematch allows drivers who are dropping off to instantly pick up another passenger without needing to circle the Airport or leave empty.

20 Massport. Noise Complaints. http://www.massport.com/logan-airport/about-logan/noise-abatement/complaints/.

mitigate homes that had been mitigated before FAA first issued sound insulation standards in 1993. The first step in this process was for Massport to submit an updated RSIP NEM. FAA accepted the 2020 NEM on December 20, 2021 that was submitted by Massport and Massport is in the process of re-starting its RSIP. Massport selected a consulting team that will survey eligible program areas to identify potentially eligible properties that meet the FAA's new criteria for a pilot program. In 2022, Massport applied for and was approved for an initial grant by the FAA to fund the beginning phase of the new RSIP program. Please see Appendix H, *Noise Abatement* for additional information.

- The fleet mix of Logan Airport continues to be composed of aircraft types with the quietest available technology (Stage 5 is the quietest). About 29 percent of 2020 and 2021 operations were conducted in aircraft meeting the requirements for Stage 5 certification, 69 percent meeting Stage 4 certification, and the remaining 2 to 3 percent meeting only Stage 3 certification. Due to the pandemic, several airlines accelerated the retirement of older, louder, and less efficient aircraft models such as the Airbus A330-200/300 and A340, Boeing 747, 757, and 767, McDonnell Douglas MD-88, Embraer 190, and the smaller Bombardier CRJ200 regional jet (RJ). The effects of the airline fleet changes on the Logan Airport noise environment started to be seen in 2021 and should be more apparent in following years.
- Massport completed a multi-year effort with Massachusetts Institute of Technology (MIT) and FAA to identify opportunities to reduce noise through changes to performance-based navigation (PBN) procedures and flight performance modifications. This is a first-in-the-nation project between the FAA and an airport operator to better understand the implications of PBN and evaluate strategies to address community concerns.
- Nighttime operations represented approximately 13 percent of total operations in both 2020 and 2021. Reflecting the overall drop in operations, total nighttime flights (commercial and cargo) decreased from an average of 195 per night in 2019 to 76 per night in 2020 and 98 per night in 2021. While nighttime operations in commercial passenger aircraft operations decreased, nighttime cargo operations increased from 2019 to 2020, most likely due to an increased demand for shipping during the pandemic. Most nighttime operations (about 86 percent in 2020 and 78 percent in 2021), occurred either before midnight or after 5:00 AM.
- The total number of people residing within the 2020 day-night average sound level (DNL) 65 decibel (dB) contour (804 people) represents a decrease of almost 91 percent compared to the 2019 estimate (8,665 people). The 2021 population estimate within the DNL 65 contour totaled 2,497 people, which is about 29 percent of 2019. The primary factor affecting the size of the DNL contours is the reduced number of aircraft operations.
- The 2021 DNL contours are similar in shape to the 2019 DNL contours but reduced in size due to the reduction in operations. The 2020 DNL contours have a slightly different shape and are slightly smaller than 2021 over East Boston and Winthrop. The population within the 2020 DNL 65 dB contour is mainly located in Revere, Winthrop (Point Shirley) and Boston (Orient Heights). Compared to 2020, the 2021 DNL contour includes more homes, and therefore greater population, in each of those areas, as well as some in East Boston (Eagle Hill).

Noise Strategy

The foundation of Massport's noise program is the *Logan Airport Noise Abatement Rules and Regulations*[21] (Noise Rules), which have been in effect since 1986. Massport's Noise Abatement Office is responsible for implementing noise abatement measures and generally monitoring community complaints and other aspects of the noise effects from Logan Airport operations.

Massport is focused on the following noise abatement initiatives:

- **Partnerships with Airlines and FAA**
  - Massport is encouraging retrofitting the Airbus A319/320/321 family of aircraft with vortex generators, which reduce tonal noise on approach. In October 2018, jetBlue Airways (the air carrier with the greatest number of operations at Logan Airport) announced plans to retrofit its older Airbus fleet with Vortex Generators. This move reflects the partnership between Massport and the airlines to reduce aircraft noise to benefit surrounding communities. As airlines retrofit aircraft and transition to the newer models of the A320 family, the number of aircraft operating at Logan Airport without the vortex generators is expected to decrease.

Image of Vortex Generator Device by Port on Wing.

  - On October 7, 2016, Massport and FAA signed a Memorandum of Understanding (MOU)[22] to frame the process for analyzing opportunities to reduce noise through changes or amendments to PBN, including area navigation (RNAV). This cooperation is a first-in-the-nation project between FAA and an airport operator to better understand the implications of PBN and evaluate strategies to address community concerns. MIT is the technical lead. Block 1 was completed in late 2017 and recommendations were made to the FAA. MIT completed the Block 2 report, which was released in December 2021. In January 2022, the Massport CAC put forth two of the procedures for further study and implementation by FAA. On January 19, 2022, Massport submitted a request to the FAA for review and implementation of two Block 2 procedures at Logan Airport.
  - The fleet operating at Logan Airport is comprised of 69 percent Stage 4 aircraft and 29 percent Stage 5 aircraft (Stage 5 being the quietest), well above the FAA minimum Stage 3 engines.
  - Massport continues to prohibit the use of Runway 4L for departures and Runway 22R for arrivals from 11:00 PM to 6:00 AM; maximize late-night over-water operations via Runways 15R and 33L; and restrict nighttime engine run-ups and use of auxiliary power units (APUs).

21 The Logan International Airport Noise Abatement Rules and Regulations, effective July 1, 1986, are codified as 740 Code of Massachusetts Regulations (CMR) 24.00 et seq (also known as the Noise Rules).

22 Massport. October 7, 2016. *Massport and FAA Work to Reduce Overflight Noise.* https://www.massport.com/news-room/news/massport-and-faa-work-to-reduce-overflight-noise/.

- Massport continues to encourage the voluntary use of reduced-engine taxiing when appropriate and safe.
- Massport continues improvement of the NOMS. Massport upgraded the system in 2019 and continues to invest in maintaining the system including installing new field monitors and infrastructure where needed. The total replacement of noise monitoring equipment at 29 sites around Logan Airport was completed in August 2021.

- **Sound Insulation Program**
  - Massport has one of the most extensive residential and school sound insulation programs in the nation. To date, Massport has installed sound insulation in 5,467 residences, including 11,515 dwelling units, and 36 schools in East Boston, Roxbury, Dorchester, Winthrop, Revere, Chelsea, and South Boston. Since the start of the program, over $170 million has been invested.
  - Approximately 8 percent of applicants also choose the Room-of-Preference option that allows the owner to identify a room (usually a bedroom or living room) for extra acoustical treatment.

Air Quality/Emissions Reduction

Prior to the pandemic, total emissions from all sources associated with Logan Airport were less than they were a decade ago, with the exception of oxides of nitrogen (NO_x). This long-term downward trend is consistent with Massport's longstanding objective to accommodate the demands of increasing passenger and cargo activity levels with fewer aircraft operations and reduced emissions wherever possible.

The reduction in aircraft operations and passenger-related ground access trips in 2020 and 2021 during the pandemic compared to 2019 resulted in lower emissions of air pollutants for which there are National Ambient Air Quality Standards (NAAQS), as well as lower emissions of the precursors to the NAAQS-regulated pollutants, GHG emissions, and hazardous air pollutants (HAPs), than emission levels estimated for Logan for the years 1999, 2000, and 2010 through 2019. Changes in the 2020 and 2021 emissions are also a result of changes in the aircraft fleet operating at Logan Airport and emission reduction initiatives by Massport that have reduced emissions. Despite the reduction in the number of operations and passengers, Massport remains committed to implementing emissions reduction strategies.

Massport prepared emissions inventories for 2020 and 2021 for the criteria pollutants carbon monoxide (CO), particulate matter (PM), and volatile organic compounds (VOCs), as well GHGs and NO_x. Key findings of those emissions inventories include:

- Total 2020 modeled emissions of VOCs, NO_X, CO, and PM decreased from 2019 by about 58 percent, 54 percent, 59 percent, and 47 percent, respectively. This is primarily attributable to the decrease in passenger activity levels and aircraft operations due to the COVID-19 pandemic.
- The 2021 total modeled emissions of VOC, NO_X, CO, and PM decreased by about 45 percent, 42 percent, 48 percent, and 23 percent, respectively, from 2019 levels. Similar to 2020, this is primarily attributable to the decrease in passenger activity levels and aircraft operations due to the COVID-19 pandemic.

- GHG emissions associated with Logan Airport in 2020 and 2021 are less than 1 percent of the most recent statewide total emissions estimates. Total Logan Airport GHG emissions (i.e., Scopes 1, 2, and 3) decreased from 2019 to 2020 by approximately 60 percent but increased from 2020 to 2021. However, 2021 GHG emissions remain below the pre-pandemic emissions of 2019.

Effect of Aircraft Engine Technology on NO_x

Aircraft emissions continue to represent the largest source (95 percent) of NO_x at Logan Airport, with the remaining comprising of ground service equipment (GSE), other sources and motor vehicles (approximately 5 percent). Massport does not have any control over aircraft emissions, which represent the vast majority of total Airport emissions.

To reduce fuel use and emissions, aircraft engine designers and manufacturers continue to work on producing more "fuel-efficient" (i.e., less fuel-burning) engines. This is achieved by enhancing engine performance with improved fuel combustion technologies, greater thrust-generating power, and less engine wear. Aircraft are also being designed to decrease fuel-burn with advancements in aircraft wing and body aerodynamics, light-weight alloy materials, and improved means of navigation. These emerging technologies and reduced fuel burn are expected to reduce emissions, reduce noise, and moderate the growth in NO_x emissions into the future.

Air Quality Strategy

Massport's air quality management strategy for Logan Airport focuses on decreasing emissions from Airport-related sources, in addition to furthering innovative means to achieve emissions reductions Airport-wide. Since Massport does not have direct control over aircraft operations or fleet choices of the airlines, it continues to focus on areas that Massport does control or has an opportunity to influence. Massport's air quality management strategy for Logan Airport focuses on decreasing emissions from Airport-related sources, in addition to furthering innovative means to achieve emissions reductions Airport-wide. Massport has established a number of goals and objectives to address air emissions from Airport operations, including the reduction of GSE and Massport vehicle fleet emissions. Massport is focused on the following initiatives:

- **Net Zero Roadmap**
    - As discussed below, in 2022, Massport released its *Net Zero Roadmap by 2031*, an Authority-wide emissions reduction strategy, the goal of which is to strive to reach net zero GHG emissions by 2031 under its direct control, by Massport's 75th anniversary. The *2022 ESPR* will report on the implementation of that program, which is summarized in the Sustainability and Resiliency Program section below. Key pathways to Net Zero include building energy efficiency, transitioning to electric vehicles, phased procurement of a sustainable energy supply, and a range of measure to help enable emissions reduction by our tenants and business partners.

- **Provide infrastructure and encourage practices that support reductions in aircraft emissions**
    - Massport provides pre-conditioned air (PCA) and 400 Hertz (Hz) power at all aircraft contact gates to reduce aircraft idling and use of APUs.

- Massport encourages single engine taxiing procedures by the airlines when safe, to reduce both noise and air emissions.
- Installing airside electric charging stations to support the use of battery-powered eGSE such as aircraft tugs and belt loaders.

- **Maximize use of HOV and reduce single occupancy vehicle trips, particularly drop-off/pick-up trips, and passenger use of private vehicles to and from the Airport**
  - Massport implements an extensive HOV strategy and ground transportation improvements (see previous section, Ground Access Strategy, for details).

- **Reduce emissions from fleets operating at Logan Airport**
  - Massport is facilitating the replacement of gas- and diesel-powered GSE with all-electric GSE (eGSE) (as commercially available) by supporting the installation of charging infrastructure.
  - In 2018, Massport was awarded an FAA Voluntary Airport Low Emission (VALE) Program grant of $1,600,000 for charging infrastructure at Terminal B. Massport contributed $626,000 in matching funds to install 50 eGSE charging stations. In 2019, through the same program, Massport was awarded $3,200,000 for charging infrastructure at Terminal C. Massport contributed $953,000 toward the installation of 42 eGSE charging stations.
  - In 2019, Massport, in partnership with jetBlue Airways, was awarded $445,000 through MassDEP's Volkswagen Diesel Settlements & Environmental Mitigation Open Solicitation grant program. The grant, aimed at reducing NO_X and GHG emissions, will support the replacement of 31 pieces of GSE with new eGSE and install four eGSE charging stations at Terminal C. United Airlines also privately pursued this grant and was awarded $280,000.
  - In 2019, Massport was awarded by the EPA under the Diesel Emission Reduction Act (DERA) a $990,000 grant to replace 44 diesel-powered GSE equipment with all-electric baggage tractors, belt loaders, and push back tugs. GSE owners at Logan Airport will contribute a $1,210,000 match.
  - In 2020, Massport was awarded a grant through FAA's VALE for charging infrastructure at Terminal E and Signature Aviation Building 14 to install 10 eSGE charging stations.
  - Massport is collaborating with the Massachusetts Clean Energy Center (MassCEC) to study opportunities to enable conversion of the ride-for-hire fleet (RideApp, Rental Car Taxi and limousine vehicles) that serves Logan to transition to electric vehicles. In early 2022, the MassCEC provided a grant to initiate this work and provide some funding to increase Logan's electric vehicle (EV) charging infrastructure.

- **Provide infrastructure to support alternative fuels including compressed natural gas (CNG) and electricity**
  - Massport has committed to increasing the availability of EV charging stations. Currently, there are 135 landside and 286 airside charging ports Massport-wide.
  - Massport continues to operate one of New England's largest retail CNG stations, which is open to the public. In 2020 and 2021, the station dispensed approximately 12,339 and 10,691 gasoline-gallon equivalents per month for Massport vehicles, respectively.

- **Reduce emissions from Massport fleet vehicles**
  - Massport continues to run and augment its fleet of alternative fuel vehicle (AFV)/alternative power vehicle (APV) on-Airport shuttle buses. Massport also has a vehicle procurement policy that requires consideration of AFVs when purchases are made.
- **Reduce emissions associated with Massport buildings, including energy needs**
  - Massport is committed to achieving Leadership in Energy and Environmental Design (LEED®) certification for eligible buildings, as appropriate, targeting LEED Silver or higher.
  - Massport continues to invest in renewable energy installations on-Airport (solar/wind).

Environmental Compliance and Management/Water Quality

Massport's approach to environmental management and compliance is a key component of its commitment to sustainability and responsible stewardship at Logan Airport. Through monitoring and documentation, Massport assesses environmental performance, continually developing, implementing, evaluating, and improving policies and programs. Massport promotes appropriate environmental practices through pollution prevention and remediation measures. Massport also works closely with tenants and operations staff at Logan Airport in an effort to continuously improve environmental compliance. Key findings in this EDR include:

- In 2020, 100 percent of Massport's stormwater samples were in compliance with National Pollutant Discharge Elimination System (NPDES) permit requirements and in 2021, 99 percent were in compliance.
- Massport annually updates and maintains its Stormwater Pollution Prevention Plan (SWPPP) for Logan Airport.
- Massport continues to assess, remediate, and bring its Massachusetts Contingency Plan sites to regulatory closure.
- In 2020, there were four reportable spills with two storm drains impacted. In 2021, there were four reportable spills with no storm drains impacted.

For additional information, please see Chapter 8, *Environmental Compliance and Management/Water Quality*.

Sustainability and Resiliency Program

Massport is committed to a robust sustainability program. Sustainability has redefined the values and criteria for measuring organizational success by using a "triple bottom line" approach that considers economic, environmental, and social well-being. Applying this approach to decision-making is a practical way to optimize economic, environmental, and social capital. Massport is taking a broad view of sustainability that builds upon the triple bottom line concept and considers the airport-specific context. Massport is committed to implementing sustainable practices Airport- and Authority-wide and continues to make progress on a range of initiatives. The following sections summarize many of the long-term and multifaceted sustainability initiatives undertaken by Massport, and which individual chapters of this *2020/2021 EDR* more fully describe, where appropriate.

Massport Roadmap to Net Zero

In March 2022, Massport published its *Roadmap to Net Zero by 2031*, an ambitious Authority-wide program to achieve net zero GHG emissions by 2031 for the facilities under its control (Scope 1 and 2). This goal would put Massport nearly two decades ahead of the 2050 deadline that many other organizations have targeted. 2031 will also be the 75th anniversary of the establishment of the Authority.

In addition to determinedly reducing the Authority's emissions to Net Zero, the plan inspires, encourages, and strives to enable the efforts and innovations of tenants, business partners, and facility users. It protects the connection the Authority provides linking Massachusetts and New England to the wider world. It strengthens and deepens the role it plays as a regional economic engine. Additionally, it is directly aimed at reducing impacts on our neighboring communities. Massport is exploring five main pathways to reach net zero:

- Energy conservation and efficiency
- Clean and renewable energy sources
- Sustainable ground transportation
- Partnerships
- Culture of sustainability and innovation

Additional information can be found at https://www.massport.com/massport/about-massport/roadmap-to-net-zero/.

In fall 2022, Massport established a Program Management Office (PMO) to help advance *Roadmap to Net Zero by 2031* implementation. The *2022 ESPR* will provide updates on program status.

Logan Airport Sustainability Management Plan (SMP)

In 2013, Massport was awarded a grant by FAA to prepare a SMP for Logan Airport. The planning effort, culminating in 2015, holistically addressed sustainability, including considerations for economic vitality, operational efficiency, natural resource conservation, and social responsibility. The Logan Airport SMP developed a framework and established an implementation plan with key performance indicators designed to track airport-wide progress through 2020.

Massport is currently advancing a series of initiatives to help reach its goals (see **Table 1-1**) in the areas of (1) energy and GHG emissions; (2) water conservation; (3) community, employee, and passenger well-being; (4) materials, waste management, and recycling; (5) resiliency; (6) noise abatement; (7) air quality improvement; (8) ground access and connectivity; (9) water quality/stormwater; and (10) natural resources.

Each year since the publication of the Logan Airport SMP, Massport has continued to widen the lens of its sustainability and resiliency goals to incorporate its other aviation and maratime facilities. During 2020

and 2021, Massport also sought new avenues to be a better neighbor to surrounding communities—reducing noise and air pollution, improving ground access to Logan Airport, and extending Diversity, Equity & Inclusion (DE&I) initiatives beyond its operational borders. Massport reports its progress towards achieving each goal, including changes in related performance, in sustainability reports. They highlight Massport's progress towards improving sustainability and enhancing resiliency at its facilities. The last published *Annual Sustainability and Resiliency Report*, was released in 2019 and can also be found at: http://www.massport.com/massport/business/capital-improvements/sustainability/sustainability-management/.

A new report is forthcoming in 2022, which will outline performance throughout the global pandemic in fiscal years 2020 and 2021 and serve to close out the performance targets from the 2015 SMP. Massport looks ahead to announcing updated measurement and verification metrics in its pursuit of net zero emissions.

Table 1-1 Logan Airport Sustainability Goals and Descriptions

Sustainability Category	Goal	Sustainability Category	Goal
Energy and Greenhouse Gas (GHG) Emissions 	Reduce energy intensity and GHG emissions while increasing the portion of Massport's energy generated from renewable sources.	Water Conservation 	Conserve regional water resources through reduced potable water consumption.
Community, Employee, and Passenger Well-being 	Promote economically prosperous, equitable, and healthy communities, and passenger and employee well-being.	Materials, Waste Management, and Recycling 	Reduce waste generation, increase the recycling rate, and utilize environmentally-sound materials.
Resiliency 	Become an innovative and national model for resiliency planning and implementation among port authorities.	Noise Abatement 	Minimize noise impacts from Logan Airport operations and expand sound insulation program.
Air Quality Improvement 	Decrease air pollutant emissions from Massport sources.	Ground Access and Connectivity 	Provide superior ground access to Logan Airport through alternative and high-occupancy vehicle (HOV) travel modes.
Water Quality/Stormwater 	Protect water quality and minimize discharge of pollutants.	Natural Resources 	Protect and restore natural resources near Massport facilities.

Leadership in Energy and Environmental Design (LEED®)-Certified Facilities at Logan Airport

The United States Green Building Council's (USGBC's) LEED rating system is the most widely recognized third-party green building certification system in North America. Massport is striving to achieve LEED certification for new construction and major renovation building projects over 20,000 square feet. For a full list of LEED Certifications see **Figure 1-8** and **Table 1-2**.

Figure 1-8 LEED-Certified Facilities at Logan Airport

Table 1-2 Leadership in Energy and Environmental Design (LEED)-Certified Facilities at Logan Airport

Massport Projects

Terminal A (LEED Certified) 2006

- First airport terminal in the world to be LEED Certified
- Priority curb locations for high-occupancy vehicles (HOVs) and bicycles
- Retrofitting with solar panels on the Terminal A roof
- Stormwater filtration
- Reflective roof
- Water use reduction features
- Natural daylighting paired with advanced lighting technologies for energy efficiency
- Use of recycled and regionally sourced materials
- Measures to enhance indoor air quality

Green Bus Depot (LEED Silver) 2014

- Rooftop solar panels
- Water and energy saving features
- Vehicle miles traveled (VMT) reduction
- New shuttle fleet including clean diesel/electric hybrid buses and compressed natural gas (CNG) buses
- Sustainably grown, harvested, produced, and transported building materials

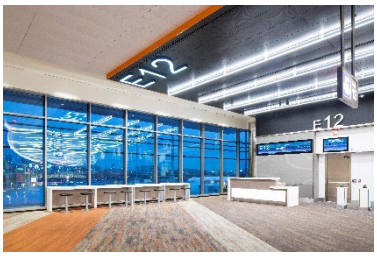
Rental Car Center (RCC) (LEED Gold) 2015

- Green building materials
- Rooftop solar panels
- Bike and pedestrian access and connections
- Natural day lighting and advanced lighting technologies for energy efficiency
- Use of recycled and regionally sourced materials
- Enhanced indoor air quality
- Plug-in stations for electric vehicles and other alternative fuel sources such as E-85 (ethanol)
- Rental car fleets which include hybrid/alternative fuel/low emitting vehicles
- Pedestrian connections
- Bicycle facilities and employee showers/changing
- Water reclamation for vehicle wash water, and use of stormwater for non-potable uses such as vehicle washing and landscaping irrigation
- VMT reduction

Table 1-2 Leadership in Energy and Environmental Design (LEED)-Certified Facilities at Logan Airport (Continued)

Massport Projects (Continued)

Terminal E New Large Aircraft Wing (LEED Gold – Commercial Interiors) 2017

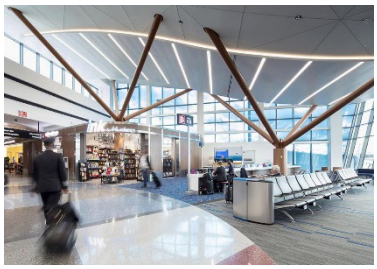


- Reduces heat island effect by providing a reflective white roof and a light color concrete tarmac
- Low-flow water fixtures and water closets
- Efficient light fixtures and efficient heating, ventilation, and air conditioning (HVAC) system
- Use of renewable energy sources
- Recycled and regionally sourced materials
- Enhanced indoor air quality
- Solar-thermal domestic hot water system to heat 100 percent of the wing's domestic water needs

Terminal B Gates 37-38 (LEED Gold – Commercial Interiors) 2019

- Energy Star-Certified Equipment
- FSC-Certified wood products used in the facility
- Expansive windows and outdoor views

Terminal B Optimization (LEED Silver) 2022



- Energy conservation measures implemented for improved performance
- Recycled or local materials utilized where feasible
- Reused over half of the prior building structure or envelope
- Significant construction and demolition waste diversion
- Implemented water conservation measures to reduce potable water use
- Facility designed to maximize outdoor views and lighting

Projects Actively Pursuing LEED Certification

Terminal C-B Connector

- Energy efficient exterior and interior lighting
- Incorporate high-performance glazing on transparent curtain walls
- Installation of electric vehicle (EV) charging infrastructure for electric Ground Support Equipment
- Energy efficient HVAC systems provide annual energy savings over baseline
- Heat island effect reduced with selected roof material and surface materials in the surrounding site

Table 1-2 Leadership in Energy and Environmental Design (LEED)-Certified Facilities at Logan Airport (Continued)

Projects Actively Pursuing LEED Certification (Continued)

Terminal E Modernization

- View Dynamic Glazing on the hold room curtainwall system to reduce glare and solar gain allowing for the reduction of the overall cooling loads
- Onyx Photovoltaic Glazing on the southern elevation that provides electrical energy generation and provides a solar screen that also eliminates glare and reduces the overall cooling loads
- Displacement ventilation throughout the Great Hall Holdroom and Concourse space that provides a 17 percent increase in HVAC energy efficiency
- All new critical infrastructure equipment is elevated above the established 100 year storm level providing sustainability and resiliency

Tenant Projects

Signature Flight Support General Aviation Facility (LEED Certified) 2008

- Mechanisms to reduce water use
- Natural day lighting with advanced lighting technologies for energy efficiency
- Window glazing and sunshades to maximize daylight and minimize heat build-up
- Recycled and regionally sourced materials
- Measures to enhance indoor air quality

Nouria Service Center (LEED Silver) 2020

- Energy efficient lighting and HVAC systems
- Installed efficient water fixtures
- Installed rooftop Solar PV array
- Installed DC-Fast Chargers for EV Vehicles

Climate and Resiliency Planning

As the Boston area will continue to experience increased temperatures, more frequent extreme weather events, and higher sea level due to climate change,[23] Massport understands the importance of preparing for impacts to protect and enhance its critical infrastructure, operational assets, and workforce. Through robust planning and regional collaboration, Massport strives to continue its leadership role in resiliency planning among port authorities, the airport industry, and the Boston region.

23 City of Boston. 2016. *Climate Ready Boston*. https://www.boston.gov/sites/default/files/climatereadyeastbostoncharlestown_finalreport_web.pdf.

At the end of 2013, Massport initiated a *Disaster and Infrastructure Resiliency Planning (DIRP) Study* for Logan Airport, the Port of Boston, and Massport's waterfront assets in South and East Boston. The DIRP Study includes a hazard analysis, modeling sea-level rise and storm surge, and projections of temperature, precipitation, and anticipated increases in extreme weather events. The DIRP Study provides recommendations regarding short-term strategies to make Massport's facilities more resilient to the likely effects of climate change. In 2014, the study was completed, and implementation of adaptation initiatives began in late 2014.

In addition to the DIRP Study and its related initiatives, Massport has completed an Authority-wide risk assessment, as part of its strategic planning initiative; issued a *Floodproofing Design Guide*; and has developed a resilience framework to provide consistent metrics for short- and long-term planning and protection of its critical facilities and infrastructure. Beyond infrastructure resiliency, Massport is also focused on incorporating social and economic resilience into its long-term operational and capital planning. Massport's *Floodproofing Design Guide* was published in November 2014 and updated in November 2018.

Operational aspects of resiliency strategy include the development of Flood Operations Plans for Logan Airport and Massport maritime facilities. These plans were introduced in 2014 and included the planned deployment of temporary flood barriers to protect up to 12 locations of critical infrastructure in the event of severe weather. Additional locations have been permanently enhanced to prevent flooding. The flood operations plans are evaluated annually to enhance their effectiveness and to adapt to evolving requirements and past experiences. Between 2020 and 2021, Massport conducted a tabletop exercises for Aviation and Maritime in preparation for extreme storm events such as hurricanes.

Massport reports on progress towards resiliency goals in its annual sustainability reports. Additional information about Massport's resiliency programs are available at: http://www.massport.com/massport/business/capital-improvements/sustainability/climate-change-adaptation-and-resiliency/.

Massport Partnerships and Community Support

Massport has a long-standing commitment to be a good neighbor. Working in concert with government, community, and civic leaders throughout Massachusetts and New England, Massport is an active participant in efforts that improve the quality of life for residents living near Massport's facilities.

Massport awarded science, technology, engineering, and math (STEM) and memorial scholarships to six students from Boston neighborhoods in 2021. Each year, high school students are selected to receive two Diversity STEM Scholarships and the Thomas J. Butler, Deborah Hadden Gray, Donna Rauseo, and Lowell L. Richards III Memorial Scholarships based on their academic achievements, post-secondary educational plans, and a demonstrated commitment to community service. Since 2007, Massport has awarded Diversity STEM Scholarships to 42 students of color who plan to pursue degrees in a STEM field. Since 2011, Massport has awarded the memorial scholarships to 34 students. Massport also provides annual scholarship grants to local high schools for students in Charlestown, Chelsea, East Boston, South Boston, Revere, and Winthrop.

Furthermore, in 2020 and 2021, Massport employees continued to participate in community activities including a children's winter coat drive, Veterans Day thank you letters, Thanksgiving food drive, and a children's backpack drive, among others.

Lastly, as an engine for economic growth, Massport continually strives to extend economic opportunities and create equity for diverse people and businesses, internally and in our surrounding communities.

Open Space/Buffer Program

Massport has invested in an extensive open space program to enhance the surrounding communities. Massport initially committed over $15 million for the planning, construction, and maintenance of four Airport edge buffer areas and two parks along Logan Airport's perimeter. These buffers include the Bayswater Embankment Airport Edge Buffer, Navy Fuel Pier Buffer, and the Southwest Service Area (SWSA) Buffer (Phases I and II). The award-winning Piers Park was completed in 1995 and has since become part of a network of greenspace that traverses East Boston from the Jeffries Point waterfront, through Bremen Street Park and the adjacent Massport Greenway Connector to Constitution Beach.

Adjacent to the current Piers Park, Piers Park Phase II will add approximately 4.2 acres of green space to the East Boston waterfront upon completion. Permitting for Piers Park II was completed in 2022; groundbreaking was held in October 2022 with construction scheduled to be complete by the end of 2023. Studies are also underway by the Trustees of Reservations for a Piers Park Phase III, which would turn an aging pier into a 3.6-acre greenspace including resiliency features to help protect the neighborhood from flooding and sea level rise. Today, East Boston enjoys 3.3 miles and more than 33 acres of green space developed or managed by Massport, in partnership with and in response to engagement with the East Boston community. More information can be found in Chapter 3, *Airport Planning*.

Figure 1-9 Parks Owned and Operated by Massport and City of Boston

Source: VHB.

Organization of the *2020/2021 EDR*

The remainder of this EDR includes:

- **Spanish Executive Summary** provides a translated version of the Executive Summary included after the English-version of Chapter 1, *Introduction/Executive Summary*.
- **Chapter 2, *Activity Levels***, presents aviation activity statistics for Logan Airport in 2020 and 2021 with a comparison to previous years. The specific activity measures discussed include air passengers, aircraft operations, fleet mix, and cargo/mail volumes.
- **Chapter 3, *Airport Planning***, provides an overview of planning, construction, and permitting activities that occurred at Logan Airport in 2020 and 2021. It also describes known future planning, construction, and permitting activities and initiatives.
- **Chapter 4, *Regional Transportation***, describes activity levels at New England's regional airports in 2020 and 2021 and updates recent regional planning activities.
- **Chapter 5*, Ground Access to and from Logan Airport***, reports on transit ridership, roadways, traffic volumes, and parking for 2020 and 2021 with a comparison to previous years.
- **Chapter 6, *Noise Abatement***, updates the status of the noise environment at Logan Airport in 2020 and 2021 with a comparison to previous years, and describes Massport's efforts to reduce noise levels.
- **Chapter 7, *Air Quality/Emissions Reduction***, provides an overview of Airport-related air quality in 2020 and 2021 with a comparison to previous years, and efforts to reduce emissions.
- **Chapter 8, *Environmental Compliance and Management/Water Quality***, describes Massport's ongoing environmental management activities including NPDES compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management.
- **Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking***, provides an overview of Massport's programs and initiatives that provide environmental benefits and reports on Massport's progress in meeting its MEPA Section 61[24] mitigation commitments for specific Airport projects.

MEPA Appendices: These include the Secretary's Certificate on the *2018/2019 EDR* and comment letters received on the *2018/2019 EDR* and responses to those comments, Secretary's Certificates on the EDRs/ESPRs issued for reporting years 2011 through 2017, a list of reviewers to whom this EDR was distributed, and a proposed scope for the *2022 ESPR*. Also included in this section are the Secretary's Certificates on the Terminal E Modernization Project ENF, Draft EA/EIR, Final EA/EIR, and the Secretary's Certificate on the Logan Airport Parking Project ENF, DEIR, and FEIR.

Appendix A – MEPA Certificates and Responses to Comments
Appendix B – Comment Letters and Responses

24 Massachusetts General Law, Chapter 30, Section 61 (M.G.L. c. 30, § 61) states that all agencies must review, evaluate, and determine environmental impacts of all projects or activities and shall use all practicable means and measures to minimize damage to the environment. For projects requiring an Environmental Impact Report, Section 61 Findings will specify all feasible measures to be taken to avoid or mitigate environmental impacts, the party responsible for funding the mitigation measures, and the anticipated implementation schedule for mitigation measures.

Appendix C – Proposed Scope for the 2022 ESPR
Appendix D – Distribution List

Technical Appendices:[25] These include detailed analytical data and methodological documentation for the various environmental analyses presented in and conducted for this EDR.

Appendix E – Activity Levels
Appendix F – Regional Transportation
Appendix G – Ground Access
Appendix H – Noise Abatement
Appendix I – Air Quality/Emissions Reduction
Appendix J – Environmental Compliance and Management/Water Quality
Appendix K – Peak Period Pricing Monitoring Reports

25 Technical appendices are available on Massport's website at www.massport.com.

Introducción/Resumen Ejecutivo

(Spanish Executive Summary)

1

Introducción/Resumen ejecutivo

Introducción

Massachusetts Port Authority (Massport) continúa con su práctica de más de cuatro décadas de brindar un registro exhaustivo sobre las tendencias medioambientales, el planeamiento de las instalaciones, los niveles de operaciones y de pasajeros del Aeropuerto Internacional Logan de Boston (Aeropuerto Logan o Aeropuerto) y los compromisos de mitigación de Massport en este *Informe de datos medioambientales (Environmental Data Report, EDR) del 2020/2021*. A petición del secretario de la Oficina Ejecutiva de Asuntos Energéticos y Medioambientales (*Energy and Environmental Affairs*, EEA) de Massachusetts, este *EDR del 2020/2021* combina los datos y el análisis de los años naturales 2020 y 2021.

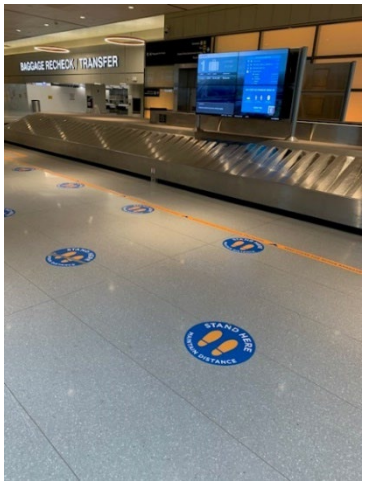
En este EDR, se informa sobre los años 2020 y 2021, reflejando los cambios significativos en el Aeropuerto Logan y en toda la industria de la aviación que ocurrieron como resultado de la pandemia de la COVID-19 en curso. Massport se ha esforzado por incluir, según la disponibilidad, actualizaciones relevantes hasta el otoño del 2022 cuando las condiciones actuales dieron lugar a cambios en los proyectos o programas que estaban vigentes en el 2019 y antes. A finales del 2020, el total de operaciones de vuelo se redujo aproximadamente en un 50 % y los niveles de pasajeros disminuyeron alrededor del 70 % en comparación con el cierre del 2019, cayendo a niveles de actividad que no se habían visto desde la década de 1970. Sin embargo, las operaciones de las aeronaves aumentaron en el 2021, con un total de operaciones de vuelo y niveles de pasajeros que se recuperaron hasta aproximadamente el 62 % y el 53 %, respectivamente, de los niveles del 2019, lo que mostró un retorno gradual hacia los niveles del 2019.

Los descensos del tráfico aéreo causados por recesiones económicas y otros «choques», como los sucesos del 11 de septiembre del 2001 y la Gran Recesión (Crisis Financiera Mundial [CFM]) de 2008/2009, han ido seguidos de ciclos de recuperación gradual, como se muestra en la **Figura 1-1**, evidenciados por una recuperación de cinco años tras los sucesos del 11 de septiembre del 2001 y una recuperación de tres años tras la CFM. A nivel nacional, como se muestra en la **Figura 1-2**, el 80 % de la recuperación de los niveles de demanda de 2019 se produjo en julio de 2021, ya que las restricciones de viaje se relajaron y las vacunas estuvieron ampliamente disponibles. En diciembre del 2021, la demanda de pasajeros en los aeropuertos de los EE. UU. se recuperó a aproximadamente el 83 % de los niveles del 2019. Gran parte de la recuperación restante dependerá del regreso tanto de los viajes de negocios como de los internacionales, ya que la capacidad nacional en todo los Estados Unidos ha vuelto casi por completo a los niveles del 2019. La recuperación total también se verá afectada por la dotación de personal de las aerolíneas.

Como se muestra en la **Figura 1-3**, la demanda en Boston, aunque está cerca de volver al 70 por ciento de los niveles del 2019 a finales del 2021, se ha retrasado respecto a la demanda nacional entre un 10 y un 15 por ciento. Esto coincide con los patrones de recuperación de otros mercados urbanos costeros en los que los viajes

de negocios y los viajes internacionales han tardado más en volver a los niveles anteriores a la pandemia. Se espera que los niveles de actividad de los pasajeros internacionales en el Aeropuerto Logan vuelvan en 2022 y más adelante.

La COVID-19 está afectando de una manera sin precedentes no solo la industria de la aviación sino la economía mundial. Mientras que la preocupación inmediata y más apremiante es el costo humano, la COVID-19 ha creado profundas implicaciones para casi todos los negocios e industrias. El impacto en la aviación ha sido particularmente grave. La situación cambia a diario y sigue habiendo una incertidumbre considerable en cuanto al impacto a corto y largo plazo de la pandemia.

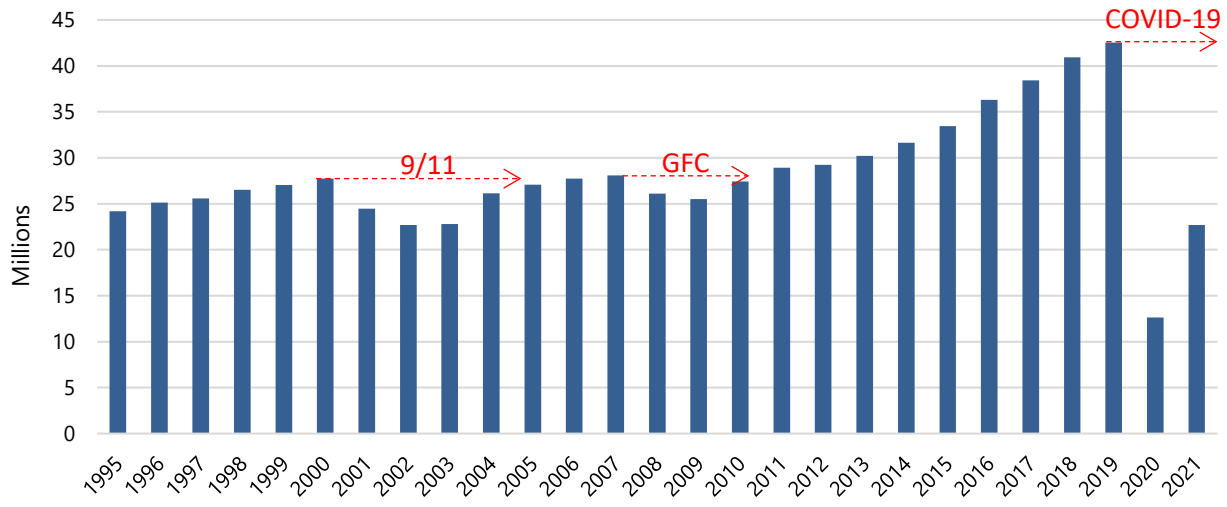


Fuente: Massport.

Notas: Terminal del Aeropuerto Logan (izquierda) y zona de recogida de equipajes (derecha) durante la pandemia de COVID-19.

Como resultado de esta significativa reducción en la actividad del Aeropuerto y la dramática reducción de los ingresos, tanto Massport, las aerolíneas y otros locatarios han tenido que ajustar y reducir sus operaciones en el 2020 y 2021. En respuesta a esto, el cronograma de varios proyectos y programas del Aeropuerto han sido revisados y retrasados. Para brindar la mayor transparencia posible, en el Capítulo 3, *Planeación aeroportuaria,* se incluyen las actualizaciones más recientes del proyecto hasta septiembre de 2022. Los próximos EDR e informes de situación y planificación medioambiental (*Environmental Status and Planning Reports*, ESPR) seguirán proporcionando actualizaciones, según estén disponibles. En general, Massport sigue evaluando y planificando la recuperación de las operaciones de las aeronaves y la actividad de los pasajeros aéreos, y sigue comprometida con la aplicación de la amplia gama de estrategias ambientales y operativas destinadas a reducir los impactos asociados a las operaciones del Aeropuerto.

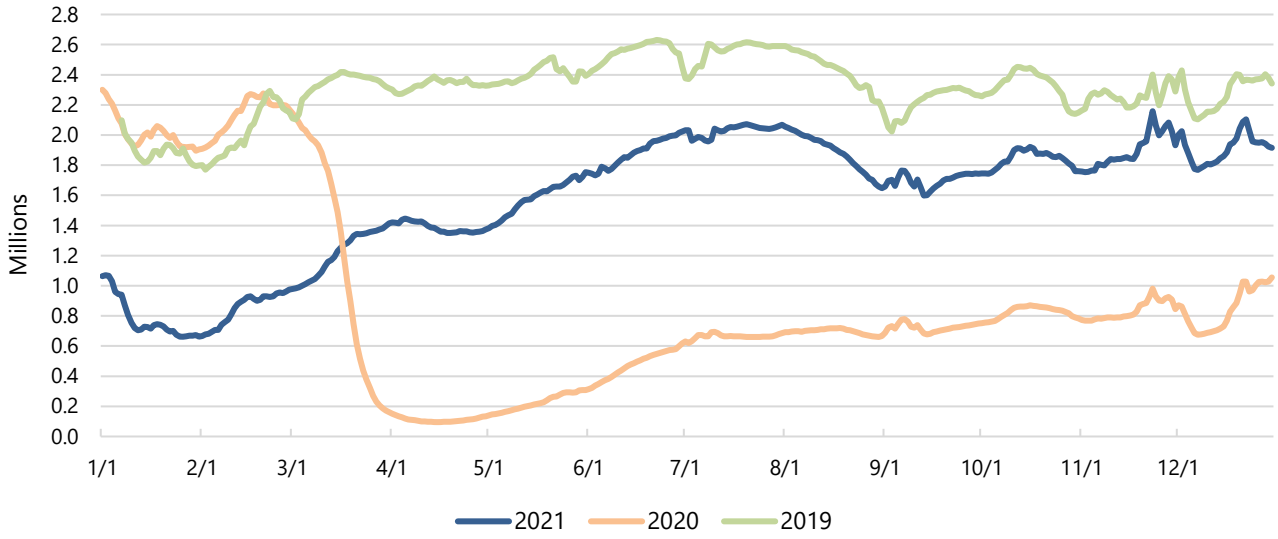
Figura 1-1 Patrón de recuperación del Aeropuerto Logan ante eventos de choque externo



Fuente: InterVISTAS; estadísticas de tráfico de Massport.

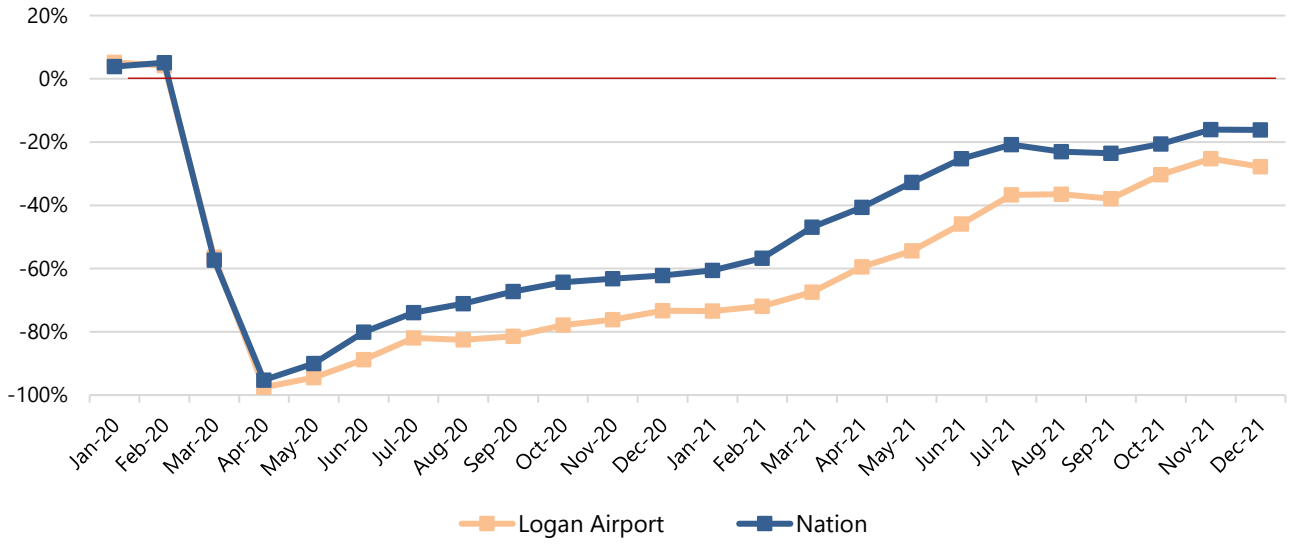
CFM, Crisis Financiera Mundial (Gran Recesión).

Figura 1-2: Rendimiento promedio de siete días de la Administración de Seguridad en el Transporte (Transportation Security Administration, TSA) en los EE. UU. Aeropuertos, de 2019 a 2021



Fuente: Informes diarios de la TSA.

Figura 1-3: Rendimiento mensual según la TSA de enero de 2020 a diciembre de 2021, en comparación con 2019



Fuente: Informes diarios de la TSA.

El Aeropuerto Logan, cuyo propietario y operador es Massport, cumple una función clave en las redes de transporte de pasajeros y de carga en el área metropolitana de Boston y de Nueva Inglaterra. Es el principal aeropuerto del área metropolitana de Boston, el aeropuerto más importante de Nueva Inglaterra en cuanto a los servicios de larga distancia y una gran puerta de entrada internacional a los EE. UU. para los servicios transatlánticos. Los límites del Aeropuerto abarcan alrededor de 970 hectáreas en el Este de Boston y Winthrop, incluidas aproximadamente 283 hectáreas en el puerto de Boston. El aeródromo del Aeropuerto Logan comprende seis pistas, alrededor de 24 140 metros de pistas para carreteo y aproximadamente 97 hectáreas de plataformas de cemento y asfalto. El Aeropuerto Logan tiene cuatro terminales de pasajeros interconectadas (Terminales A, B, C y E), cada una con sus propias instalaciones de emisión de pasajes, reclamo de equipaje y transporte terrestre. El Aeropuerto está a menos de cinco kilómetros del centro de Boston y se puede acceder a este por líneas de transporte público, numerosas líneas de autobuses directas y un sistema de carreteras bien conectadas. Massport también brinda el servicio de autobuses Logan Express desde y hacia el Aeropuerto Logan para los pasajeros de vuelos y para los empleados de una serie de aparcamientos de incentivo.

Este *EDR 2020/2021* pertenece a una serie de documentos de revisión medioambiental anual entregados al secretario de la Oficina Ejecutiva de Energía y Asuntos Medioambientales (Executive Office of Energy and Environmental Affairs, EEA) en cumplimiento con la Ley de Políticas Medioambientales de Massachusetts

(Massachusetts Environmental Policy Act, MEPA).[1] Desde 1979, Massport presenta estos documentos para informar los efectos medioambientales acumulados de las operaciones y de las actividades del Aeropuerto Logan. El Aeropuerto Logan es el primer aeropuerto del país para el que se confeccionó una evaluación medioambiental anual sobre las actividades aeroportuarias y Massport continúa siendo líder en informes medioambientales.

Aproximadamente cada cinco años, Massport confecciona un ESPR, que brinda un panorama histórico y prospectivo del Aeropuerto Logan. Los EDR, que se confeccionan anualmente en los intervalos entre los ESPR, brindan una revisión histórica de las condiciones medioambientales para el año que se informa en comparación con el año anterior. Este *EDR 2020/2021* sigue al *EDR 2018/2019* e informa sobre las condiciones de 2018 y 2019. En el último ESPR, se utilizó el 2017 como año de base. Mientras Massport y toda la industria de la aviación continúan ajustándose a la evolución de las condiciones operativas, nosotros seguimos evaluando los impactos actuales y futuros de la pandemia. Cuando es posible, este EDR incluye información relevante y actualizaciones. Sin embargo, se abordarán proyecciones y análisis más detallados en el próximo *ESPR 2022*.

A petición de la Secretaria tras su revisión del *EDR 2018/2019*, se ordenó a Massport que preparara este *EDR 2020/2021* combinado y su alcance fue establecido por la certificación del secretario sobre el *EDR 2018/2019* de fecha 19 de marzo de 2021, que se incluye en el Apéndice A, *Certificaciones y respuestas a los comentarios de la MEPA*. Este EDR cumple todos los requisitos establecidos en la certificación del secretario en el *ESPR 2018/2019,* incluye respuestas a los comentarios en la certificación del secretario, y actualiza y compara los datos presentados en el *EDR 2018/2019* sobre los siguientes temas:

- Niveles de actividad (incluidas las operaciones de las aeronaves, las actividades de los pasajeros y los volúmenes de carga)
- Calidad del aire/Reducción de emisiones
- Función del Aeropuerto Logan en la red de transporte regional
- Acceso terrestre desde y hacia el Aeropuerto
- Disminución del ruido
- Planeación aeroportuaria (incluidas las actividades que están en curso y los proyectos venideros)
- Calidad del agua/Cumplimiento medioambiental
- Sustentabilidad y resiliencia
- Medidas medioambientales beneficiosas y compromisos de mitigación

Para mejorar la utilidad de este EDR como documento de referencia para los revisores, este informe también presenta datos históricos sobre las condiciones medioambientales en el Aeropuerto Logan desde 1990, en las instancias en que hay información histórica disponible. Cuando corresponde y está disponible, este EDR también incluye actualizaciones hasta el otoño del 2022.

1 Capítulo 30 de las leyes generales de Massachusetts, secciones 61-62H. La MEPA se implementa mediante las reglamentaciones publicadas en el Código de Normas de Massachusetts (Code of Massachusetts Regulations, CMR) 301 11.00 (las reglamentaciones de la MEPA).

Este EDR incluye una traducción al español de este capítulo. Esta versión traducida se incluye después de la versión en inglés del resumen ejecutivo.

EEA n.° 3247

Presentada por

Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston, MA 02128

Stewart Dalzell,
director adjunto - Planificación Ambiental y Permisos
Planificación estratégica y de negocios
(617) 568-3524

Brad Washburn,
gerente de Planificación Ambiental y Permisos,
Planificación Estratégica y de Negocios
(617) 568-3546

Proceso de revisión medioambiental del Aeropuerto Logan

Este *EDR del 2020/2021* es la próxima presentación de Massport en su proceso de revisión medioambiental estatal formal, único, pero bien consolidado, que evalúa los impactos medioambientales acumulados del Aeropuerto Logan. Los documentos brindan un contexto actual e histórico frente al cual los proyectos individuales del Aeropuerto Logan que alcanzan umbrales de revisión medioambiental estatales y federales se evalúan sobre las bases de proyectos específicos. A continuación, se describen los procesos de revisión medioambiental específicos del proyecto para todo el Aeropuerto.

Contexto histórico para el proceso de EDR/ESPR del Aeropuerto Logan

En 1979, el secretario de la EEA emitió un certificado solicitando a Massport que defina, evalúe y divulgue cada tres años el impacto del crecimiento a largo plazo del Aeropuerto a través de un Informe de impactos medioambientales genérico (Generic Environmental Impact Report, GEIR). En el certificado también se solicitaron actualizaciones anuales provisorias para brindar datos sobre las condiciones para los años entre los GEIR. El GEIR evolucionó hasta transformarse en una herramienta de planificación eficaz para Massport y brindó proyecciones de condiciones medioambientales para que los efectos acumulados de los proyectos individuales se puedan evaluar dentro de un contexto más amplio.

La EEA eliminó los GEIR después de las revisiones de 1998 para sus reglamentaciones de la MEPA. Sin embargo, la certificación del secretario sobre la actualización anual de 1997[2] propuso un proceso de análisis medioambiental revisado para el Aeropuerto Logan lo que dio como resultado la confección de los EDR/ESPR de Massport subsiguientes. El EPRS más amplio brinda un análisis de largo alcance de las operaciones, de los

2 Certificación del secretario de la Oficina Ejecutiva de Asuntos Medioambientales sobre la actualización anual del Aeropuerto Logan de 1997, emitida el 16 de octubre de 1998.

pasajeros y de los impactos acumulativos, mientras que los EDR se confeccionan anualmente para brindar una revisión de las condiciones medioambientales para el año que se informa en comparación con el año anterior. Se desarrolló el proceso del EDR/ESPR para permitir que se analicen los proyectos individuales en el Aeropuerto Logan en un contexto más amplio en todo el Aeropuerto. Como se estableció en la introducción del *ESPR de 1999,* "mientras que el ESPR y el EDR de Logan brindan el contexto amplio de la planificación para los proyectos propuestos para el Aeropuerto Logan y los conceptos de planificación futuros que Massport analiza, no se puede crear ningún proyecto sólido en las bases de inclusión y análisis en el *ESPR de 1999"*. Luego, establece que los proyectos que cumplen con los umbrales de revisión de la MEPA o Ley Nacional de Políticas Medioambientales (National Environmental Policy Act, NEPA) deben someterse a estos procesos, si es necesario. En resumen, los EDR/ESPR brindan un contexto de planificación acumulada que complementa las presentaciones individuales específicas del proyecto.

En el 2018 y 2019, si bien los niveles de pasajeros tuvieron un crecimiento significativo y alcanzaron nuevos niveles máximos, las operaciones de las aeronaves y los efectos medioambientales asociados se mantuvieron bien por debajo de los niveles analizados previamente para el Aeropuerto Logan. Por lo tanto, el crecimiento de la aviación pronosticado presentado en el *ESPR del 2004,* la afirmación sobre la que se estableció inicialmente el cronograma del ESPR, no se produjo. En consecuencia, con la aprobación del secretario, Massport confeccionó los *EDR del 2009 y del 2010* en lugar del ESPR originalmente planeado para el 2009. El *ESPR del 2011,* presentado a principios del 2013, informó sobre el año natural del 2011 y los pronósticos de los niveles actualizados de las actividades de los pasajeros y de las operaciones de las aeronaves. El *EDR del 2012/2013* conjunto presentó condiciones para ambos años naturales, 2012 y 2013. En el *EDR del 2014,* el *EDR del 2015* y el *EDR del 2016* se presentaron las condiciones para los años naturales del 2014, 2015 y 2016. Del mismo modo, con el fuerte crecimiento de pasajeros y la evolución de las tendencias de acceso terrestre con la industria emergente de las aplicaciones de transporte en coche (antes denominadas empresas de redes de transporte [transportation network companies, TNC]), la EEA permitió a Massport aplazar el *ESPR del 2016*.

El *ESPR del 2017* proporcionó un análisis integral acumulado de los niveles de actividad y de las condiciones medioambientales para el 2017 y un horizonte de planeación futura. En el ESPR, Massport propuso confeccionar un *EDR del 2018/2019* conjunto para informar los efectos de todas las actividades del Aeropuerto Logan basadas en la actividad de pasajeros y en las operaciones de las aeronaves reales en el 2018 y 2019. Como se señaló anteriormente, debido a la pandemia de COVID-19, el Secretario exigió a Massport que presentara un *EDR del 2020/2021* combinado para comenzar a evaluar las tendencias de crecimiento posteriores a la pandemia.

Aunque este informe se centra en gran medida en los años 2020 y 2021, Massport ha anotado los puntos destacados de recuperación preliminares que se evaluarán con más detalle en el *ESPR del 2022*. Si corresponde, Massport continuará identificando y abordando cualquier tendencia de aviación y medioambiental a largo plazo tanto en los EDR como en los ESPR.

Revisión específica del proyecto

Aunque esta revisión de todo el Aeropuerto brinda el contexto de planificación más amplio para los proyectos propuestos y para los conceptos de planificación futuros, determinados proyectos del Aeropuerto también están sujetos al proceso público de revisión medioambiental específico del proyecto cuando cumplen los umbrales de revisión medioambiental estatal. Cuando se requiere, los locatarios de Massport y del Aeropuerto presentan

formularios de notificación ambiental (Environmental Notification Forms, ENF) e informes de impacto ambiental (Environmental Impact Reports, EIR) de conformidad con la MEPA. De manera similar, cuando se desencadena la revisión medioambiental de la NEPA, se revisan los proyectos de acuerdo con el proceso de revisión medioambiental de la NEPA.[3]

Massport entiende que la MEPA modificó su reglamento en 301 CMR 11.00 a partir del 24 de diciembre de 2021. Además, la MEPA publicó el *Protocolo Provisional de la MEPA sobre Adaptación y Resiliencia al Cambio Climático*, en vigencia para todas las nuevas presentaciones a partir del 1 de octubre de 2021, y el *Protocolo de Participación Pública para las Poblaciones de Justicia Medioambiental de la MEPA* y el *Protocolo Provisional de la MEPA para el Análisis de los Impactos del Proyecto en las Poblaciones de Justicia Medioambiental*, en vigencia para todas las nuevas presentaciones a partir del 1 de enero de 2022. Todos los proyectos del Aeropuerto Logan que se presenten ante la MEPA cumplirán con estas normas y protocolos modificados. En los futuros EDR y ESPR, se documentarán los compromisos de mitigación de sus proyectos que apoyan estas actualizaciones en el capítulo 9, *Medidas beneficiosas para el medioambiente y seguimiento de la mitigación del proyecto*

Los proyectos actuales y futuros potenciales que se prevé que se sometan a la revisión de conformidad con la MEPA y/o NEPA se analizan en el Capítulo 3, *Planeación* aeroportuaria.

Divulgación del EDR de 2020/2021

Aunque los EDR y ESPR no son proyectos sujetos al *Protocolo de Participación Pública de la MEPA para Poblaciones de Justicia Ambiental*, Massport reconoce la importancia de un robusto enfoque de divulgación para asegurar que la comunidad conozca estos informes y tenga la oportunidad de revisarlos y hacer comentarios. La lista de distribución de los informes EDR y ESPR se actualiza periódicamente para incluir a numerosas organizaciones, residentes y organismos que han expresado su interés en estos informes. Además, el Resumen Ejecutivo se ha traducido y continuará siendo traducido al español.

Sin embargo, a la luz del *Protocolo de Participación Pública de la MEPA para las Poblaciones de Justicia Medioambiental*, Massport se ha embarcado en un proceso de divulgación ampliado para este *EDR de 2020/2021*, y tiene la intención de seguir desarrollando su enfoque de divulgación para futuras presentaciones.

Se implementaron las siguientes medidas para esta presentación:

- Publicar un anuncio en las redes sociales notificando a la comunidad sobre la próxima presentación.
- Distribuir el *EDR de 2020/2021* electrónicamente a la Lista de Referencia de Justicia Medioambiental (Environmental Justice, EJ) proporcionada por la MEPA para el reciente Proyecto de Mejora de la Zona de Seguridad de la Pista 9-27 de Massport.

Este Resumen Ejecutivo está disponible en otros idiomas a solicitud.

Comuníquese con Brad Washburn al 617-568-3546 o en Bwashburn@massport.com.

3 42 USC Sección 4321 et seq. La Administración Federal de Aviación (Federal Aviation Administration, FAA) implementa la NEPA mediante la ordenanza 1050.1F, Impactos medioambientales, de la FAA: Políticas y procedimientos, Administración Federal de Aviación, Departamento de Transporte de los Estados Unidos, fecha de entrada en vigor: 16 de julio de 2015.

- Incluir una referencia en este Resumen Ejecutivo, en la carta de presentación y en el Aviso de Disponibilidad que se envió a los revisores, de que este Resumen Ejecutivo está disponible en otros idiomas si se solicita.
- Traducir el aviso de disponibilidad al español.
- Traducir el Resumen Ejecutivo al español.
- Publicar el *EDR del 2020/2021* en el sitio web de Massport al momento de la presentación ante la MEPA, permitiendo aproximadamente una semana más de tiempo para revisión.
- Preparar y publicar en el sitio web de Massport (https://www.massport.com/massport/about-massport/project-environmental-filings/logan-airport/) las hojas de datos en inglés y en español que estará disponible durante el período de comentarios del *EDR del 2020/2021*.

Además, Massport reconoce la importancia del compromiso continuo con la comunidad y las organizaciones. A continuación, se destacan algunos de estos esfuerzos de compromiso:

- Massport renovó un acuerdo para proporcionar financiación al Centro de Salud Comunitario de East Boston para ayudar a ampliar los esfuerzos de su Programa de Prevención y Tratamiento del Asma y la Enfermedad Pulmonar Obstructiva Crónica (EPOC) en East Boston y Winthrop, que proporciona servicios que incluyen exámenes para niños, distribución de kits para el asma y visitas a domicilio, entre otros.
- Massport apoya, cuando es posible, al Comité Asesor Comunitario (Community Advisory Committee, CAC) de Massport. El CAC de Massport es un órgano legislativo estatal que colabora con Massport en una serie de temas relacionados con la Autoridad, entre los que se incluyen las cuestiones medioambientales. Se puede obtener más información acerca del CAC de Massport en https://massportcac.org/.

Contexto de la planificación del Aeropuerto Logan

El Aeropuerto Logan cumple una función clave en las redes de transporte de pasajeros y de mercadería del área metropolitana de Boston y de Nueva Inglaterra. El Aeropuerto es uno de los aeropuertos con la mayor limitación terrestre del país y está rodeado en tres laterales por el puerto de Boston (consulte las **Figuras 1-4** y **1-5**).

Crecimiento de la actividad de pasajeros y de aeronaves en el Aeropuerto Logan

Al igual que el resto de la industria aeroportuaria estadounidense, el Aeropuerto Logan ha experimentado un fuerte descenso de la actividad de las aerolíneas y del volumen de pasajeros en los dos últimos años. Los diferentes estados y regiones dentro de los Estados Unidos han diferido en su respuesta a las restricciones de la COVID-19, lo que a su vez reflejó la voluntad de los consumidores de reanudar los viajes hacia y desde determinados mercados. El resultado neto es que la recuperación del transporte aéreo en el Aeropuerto Logan sigue siendo un trabajo en curso. Aunque en 2020 los pasajeros cayeron a niveles de actividad no vistos desde la

década de 1970, en 2021 el Aeropuerto mostró un retorno gradual hacia los niveles de 2019 (**Figura 1-6**). En el año 2022, se ha visto una mayor recuperación, pero no en los niveles previos a la pandemia.

A partir de marzo de 2020, el Aeropuerto Logan experimentó reducciones dramáticas de los niveles de pasajeros y vuelos asociados con la pandemia de la COVID-19. Los niveles de actividad de pasajeros alcanzaron un total de aproximadamente 12,6 millones en 2020, una disminución del 70,3 por ciento en comparación con los niveles de 2019. El número total de operaciones de aeronaves en el Aeropuerto Logan se redujo en un 51,6 %, pasando de 427 176 operaciones en 2019 (que fue un máximo histórico desde 2001) a 206 702 operaciones en el 2020.

En 2021, el Aeropuerto continuó su senda de recuperación y añadió 10,0 millones de pasajeros, y terminó el año con unos 22,7 millones, recuperando aproximadamente el 53,3 % de los niveles de pasajeros de 2019. Las operaciones en el 2021 aumentaron a 266 034, lo que representó una recuperación del 62,3 % de los niveles del 2019.

FIGURA 1-4 Vista aérea del Aeropuerto Logan

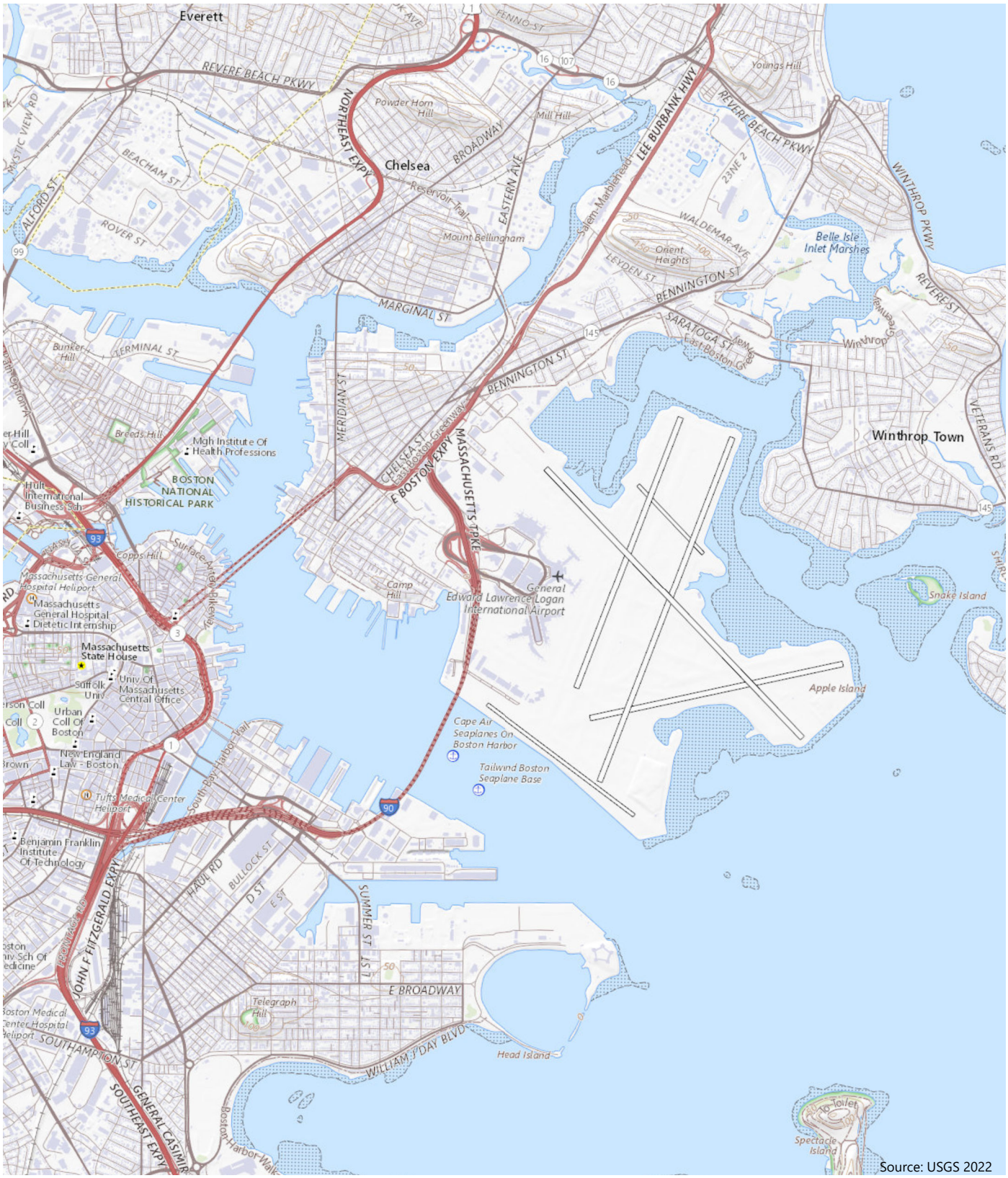
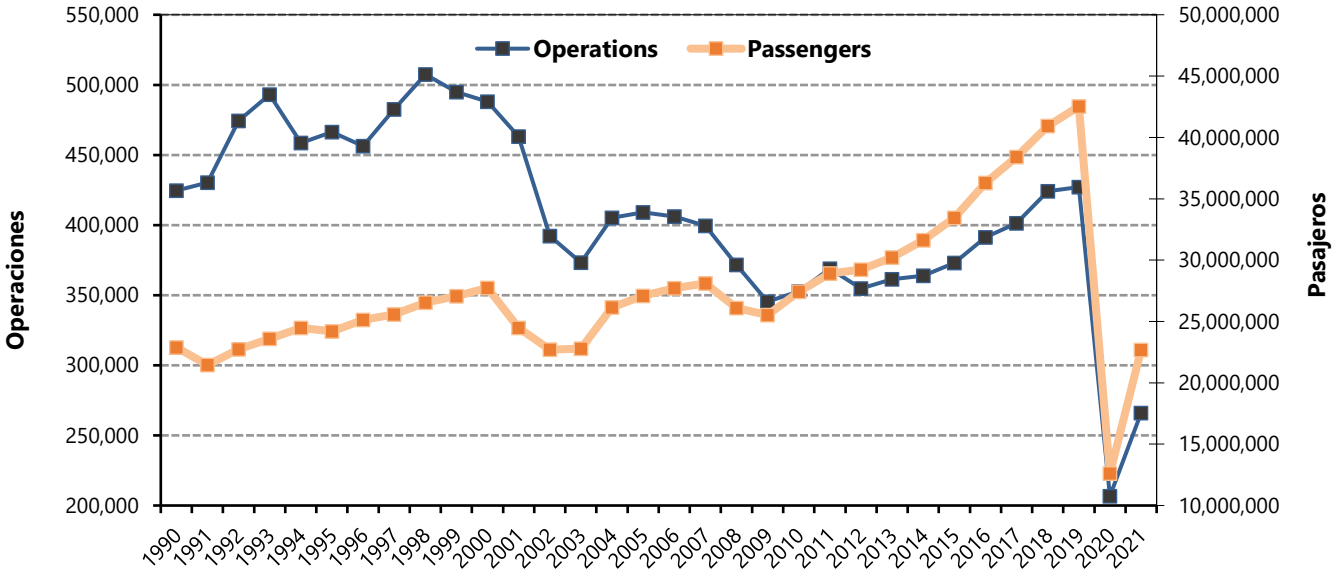


FIGURA 1-5 Aeropuerto Logan y alrededores

Figura 1-6 Niveles de pasajeros anuales y operaciones de aeronaves en el Aeropuerto Logan (1990-2021)



Los niveles de actividad del Aeropuerto Logan están estrechamente ligados a la economía regional y nacional

Los niveles de actividad del Aeropuerto Logan son impulsados ampliamente por las economías locales, regionales y nacionales. Tal como puede verse al observar las tendencias a largo plazo, está claro que cuando la economía es fuerte, el Aeropuerto Logan crece. Análogamente, las disminuciones más importantes en los niveles de pasajeros y en el funcionamiento de las aeronaves se observan muy cerca de perturbaciones nacionales e internacionales importantes. Ejemplos de las disminuciones más significativas incluyen la huelga de la Organización de Controladores Profesionales de Tráfico Aéreo (Professional Air Traffic Controllers Organization, PATCO) en 1981, el 11 de septiembre del 2001, la Gran Recesión en el 2008/2009 y ahora la pandemia de la COVID-19.

Cuando ha habido un crecimiento significativo, como se observó hasta el 2018 y el 2019, Massport ha puesto en práctica estrategias para abordar ese crecimiento de manera que permita que el Aeropuerto Logan evolucione de manera sostenible y ambientalmente responsable.

El Aeropuerto Logan es el aeropuerto más grande de los seis estados de la región de Nueva Inglaterra, que tiene una población de aproximadamente 15,1 millones de residentes en el 2021. El Aeropuerto está ubicado en Massachusetts, que alberga a 7,0 millones de residentes o cerca del 46,6 por ciento de la población de Nueva Inglaterra hasta el 2021. El Aeropuerto Logan presta servicios a pasajeros de toda Nueva Inglaterra y la principal zona de influencia está compuesta por los siguientes cinco condados de

Massachusetts: Essex, Middlesex, Norfolk, Plymouth y Suffolk (que incluye la ciudad de Boston). Según las estadísticas disponibles más recientes, 4,4 millones de personas residen en estos cinco condados.

Antes de la COVID-19, el área metropolitana de Boston había mantenido en forma constante una menor tasa de desempleo que la de la Mancomunidad y que la del país. En 2019, el área estadística metropolitana de Boston tenía una tasa de desempleo del 2,8 por ciento, que era menor que la tasa de la Mancomunidad (3,1 por ciento) y que la del país /(3,7 por ciento). Incluso durante los años de la recesión económica de 2008/2009, Boston y la Mancomunidad sufrieron tasas de desempleo por debajo del promedio nacional.[4] Massachusetts registró recientemente una tasa de desempleo históricamente alta del 16,7 por ciento en abril del 2020, que fue mayor que la tasa de desempleo nacional del 14,4 por ciento el mismo mes.[5] Después de alcanzar tasas de desempleo récord en el punto álgido de la pandemia en 2020, la tasa de desempleo de la Mancomunidad continuó bajando de forma constante en los meses restantes del 2020 y a lo largo del 2021, cayendo al 4,1 % en diciembre del 2021. El Aeropuerto no solo atiende a una población en crecimiento, sino también a una población con mayores ingresos. El ingreso *per capital* en el 2020 fue de USD 85 724 (dólares estadounidenses actuales) en el área de servicios principal del Aeropuerto, 11,3 por ciento más alta que en la Mancomunidad y 44,9 por ciento más alta que el promedio nacional.[6]

El Aeropuerto Logan es un recurso de transporte y económico clave en la región de Nueva Inglaterra, en el estado y en el área metropolitana de Boston, que alberga una gran variedad de industrias y cuenta con una población relativamente más rica en comparación con el promedio de los EE. UU. Las industrias con la mayor cantidad de empleados incluyen la atención médica y la asistencia social,[7] los servicios educativos, profesionales, científicos y tecnológicos (que incluyen la creciente industria biotecnológica de Boston).[8] En 2019, Boston/Cambridge, la mayor agrupación biofarmacéutica del país, se comprometió a impulsar la salud digital a través de la creación de una base de datos de registros sanitarios digitales en la que se espera que la industria crezca hasta generar más de USD 350 000 millones de dólares en valor anual para el 2025.[9] Incluso durante el apogeo de la pandemia mundial, que provocó una recesión económica en otros sectores empresariales, la industria biofarmacéutica de la Mancomunidad siguió prosperando, añadiendo unos 85 000 puestos de trabajo y recaudando más de USD 5800 millones en capital de riesgo.

Además de respaldar el crecimiento y éxito económico del estado, el Aeropuerto Logan y la industria aeroportuaria siempre han sido elementos importantes para la economía estatal y regional. La *Actualización del estudio del impacto económico del aeropuerto estatal de Massachusetts,* realizada por el

4 Oficina de estadística laboral (Bureau of Labor Statistics) de los EE. UU. 2020.

5 Oficina de estadística laboral (Bureau of Labor Statistics) de los EE. UU.

6 Departamento de Comercio, Oficina de Análisis Económico de los EE. UU. (U.S. Department of Commerce, Bureau of Economic Analysis). Los últimos datos para el área estadística metropolitana fueron los del 2020.

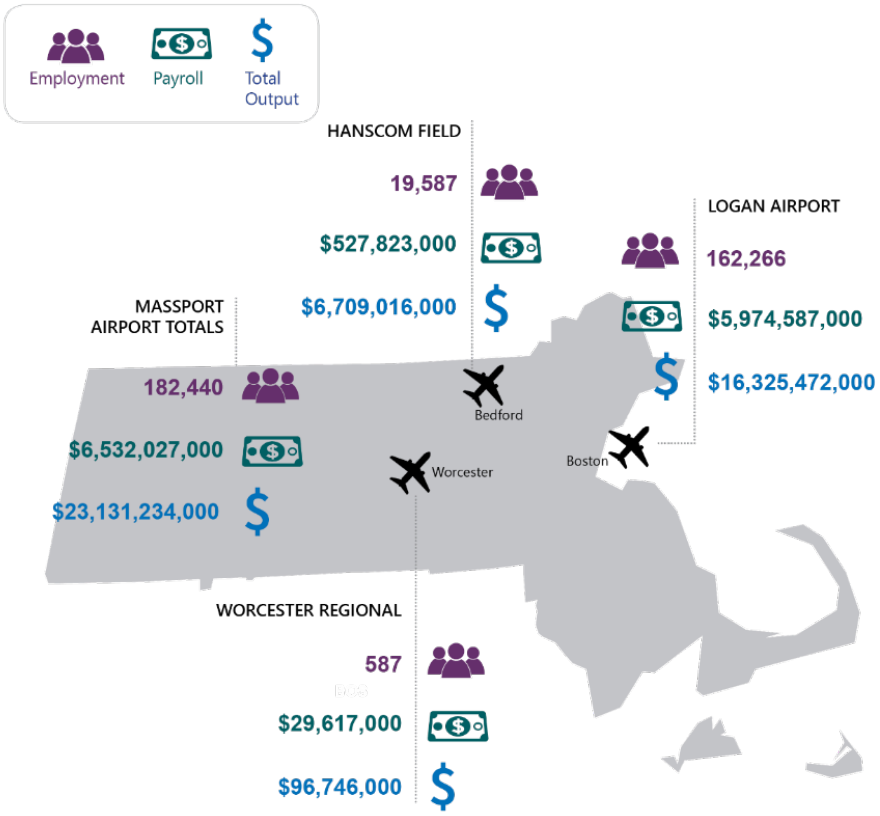
7 Subsector de asistencia social del Sistema de Clasificación Industrial de América del Norte e incluye los servicios individuales y familiares; los servicios comunitarios de alimentación y vivienda, y los servicios de emergencia y otros servicios de ayuda; los servicios de rehabilitación profesional; y los servicios de guardería. Oficina de estadística laboral (Bureau of Labor Statistics) de los EE. UU. 2019. Panorama de las industrias - Asistencia social: NAICS 624. https://www.bls.gov/iag/tgs/iag624.htm.

8 Oficina de Censos a través de Data USA. 2019. Boston-Cambridge, Newton, perfil del área metropolitana MA-NH. www.datausa.io

9 Conferencia del Consejo de Biotecnología de Massachusetts (MassBio); previsión de McKinsey "La era de la mejor exponencial en la atención médica" https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/the-era-of-exponential-improvement-in-healthcare.

Departamento de Transporte de Massachusetts (Massachusetts Department of Transportation, MassDOT) en el 2014 y actualizada más recientemente en 2019,[10] calcula que los aeropuertos de Massport (incluidos el Aeropuerto Logan, Worcester Regional Airport y Hanscom Field) contribuyen con aproximadamente USD 23,1 mil millones en producción a la economía de Massachusetts anualmente. De esta producción, el 71 por ciento se debe solo al Aeropuerto Logan.[11] La producción total incluye negocios dentro del aeropuerto, construcción, visitantes y efectos multiplicadores (consulte la **Figura 1-7**).[12] El Aeropuerto Logan respalda más de 162 000 puestos de trabajo directos e indirectos, al mismo tiempo que genera aproximadamente USD 16,3 mil millones por año en producción económica total.[13]

Figura 1-7 Impacto económico total de los aeropuertos de Massport



Fuente: MassDOT, Massachusetts Statewide Airport Economic Impact Study Update, 2019.
Notas: "Totales para Massachusetts" se refiere a la producción económica total de todos los aeropuertos de Massachusetts.

10 División de Aeronáutica de MassDOT. 2019. Actualización del estudio sobre el impacto económico de los aeropuertos del estado de Massachusetts. https://www.mass.gov/doc/aeronautics-economic-impact-study-2019/download.

11 *Ibíd.*

12 Los efectos multiplicadores se refieren a la recirculación del dinero en la economía local después de haber sido gastados inicialmente por el Aeropuerto, sus locatarios o los turistas. Esta recirculación aumenta el impacto general de las operaciones del Aeropuerto en la economía local.

13 División de Aeronáutica de MassDOT. 2019. *Actualización del estudio del impacto económico del aeropuerto estatal de Massachusetts.* https://www.mass.gov/files/documents/2019/03/25/AeroEcon_ImpactStudy_January2019.pdf.

El Aeropuerto Logan se considera un aeropuerto de origen y destino (O&D)[14] tanto nacional como internacionalmente, lo que significa que, aproximadamente, el 90 por ciento de los pasajeros del Aeropuerto Logan inician o finalizan su viaje en el Aeropuerto Logan. Los aeropuertos principales, como el de Atlanta o Chicago, prestan servicios a muchos más pasajeros anualmente, pero en comparación con los aeropuertos de O&D, como el Aeropuerto Logan, pasa un porcentaje mayor de pasajeros en tránsito en los aeropuertos principales a través de los vuelos de conexión. El Aeropuerto Logan se considera un aeropuerto de origen y destino nacional e internacional, lo que significa que menos del 10 % de los pasajeros aéreos conectan a través del aeropuerto Logan.

Estado de las predicciones

En el *ESPR del 2017*, se presentó una predicción actualizada para las operaciones de las aeronaves y la actividad de los pasajeros del Aeropuerto. La predicción se centró en un horizonte de planeación futura que incluyó una proyección de 50 millones de pasajeros aéreos anuales y 486 000 operaciones de aeronaves anuales. Las proyecciones del ESPR de Massport fueron congruentes con la proyección del área de la terminal de la Administración Federal de Aviación (FAA) en ese momento. Sin embargo, la pandemia de la COVID-19 ha reducido drásticamente el tráfico de pasajeros aéreos en el 2020 y 2021, y no se espera volver a los niveles de 2019 a corto plazo.

Debido a la economía sólida en los meses anteriores al inicio de la pandemia de la COVID-19, los niveles de actividad de los pasajeros y las operaciones de las aeronaves en el aeropuerto de Logan aumentaron rápidamente. Ese crecimiento se debió en gran parte a las condiciones económicas positivas en la región de Boston, el bajo desempleo, una base económica diversa y fuerte, y la inversión continua en bienes raíces comerciales y residenciales, en ciencias biológicas en particular, en las finanzas, en la atención médica y en la educación superior. Al igual que en otros aeropuertos de los EE. UU., esta tendencia de crecimiento se vio alterada en marzo del 2020, al comienzo de la pandemia.

En consecuencia, las proyecciones del *ESPR del 2017* tendrán que actualizarse a medida que se comprendan mejor los efectos a más largo plazo de la pandemia de la COVID-19. La metodología para las próximas previsiones del *ESPR del 2022* se preparará utilizando técnicas de previsión estándar del sector, que incluyen los siguientes análisis:

- Patrones históricos de tráfico aeroportuario y tarifas aéreas.
- Datos históricos socioeconómicos y demográficos.
- Estrategias de las aerolíneas y tendencias de la industria.
- Previsión de datos socioeconómicos y demográficos.

Esta metodología es similar a la utilizada por la FAA para desarrollar la Previsión del Área de Terminal.

14 El "tráfico de origen y de destino" se refiere al tráfico de los pasajeros que se origina o que termina en un aeropuerto o en un mercado en particular. Un mercado de O&D fuerte, como Boston, genera una demanda local de pasajeros significativa, ya que muchos pasajeros inician y terminan su viaje en ese mercado. El tráfico de O&D es diferente al tráfico de conexión, que es tráfico de pasajeros que no inician ni terminan en el aeropuerto, sino que solo hacen conexiones en el aeropuerto en ruta hacia otros destinos.

Las previsiones se elaborarán combinando una metodología microeconómica ascendente (a corto plazo) y una metodología macroeconómica descendente. La previsión ascendente incluye una revisión de las tendencias recientes del sector y de las expectativas de los futuros datos de servicios y horarios de las aerolíneas. Incorporará las aportaciones de las compañías aéreas en relación con la recuperación de la capacidad a corto plazo de la COVID-19, así como las aportaciones de grupos comerciales del sector como Airlines For America (A4A), la Asociación Internacional de Transporte Aéreo (International Air Transport Association, IATA) y el Consejo Internacional de Aeropuertos (Airports Council International, ACI). Estos grupos industriales proporcionan un contexto importante en la recuperación de los mercados de entrada, como Boston, en comparación con los mercados nacionales y regionales.

Los análisis estadísticos de la relación entre la demanda histórica y las condiciones económicas locales y nacionales servirán de base para la previsión descendente a largo plazo. Anteriormente, factores econométricos como el Proyecto Interior Bruto (Gross Domestic Project, GDP) de los Estados Unidos, el GDP regional, la renta personal total regional y el costo del combustible sirvieron como variables independientes representativas en el análisis de regresión. Dado el tamaño del mercado de Boston y su fuerte economía, estos factores pueden volver a utilizarse en las previsiones de la demanda de aviación del *ESPR del 2022*.

También es importante señalar que, dada la posición del Aeropuerto Logan en el mercado regional del noreste, también se tendrán en cuenta las tendencias y la dinámica del mercado en otros aeropuertos cercanos, como el Aeropuerto Regional de Manchester-Boston (MHT) y el T.F. de Rhode Island T.F. Green International Airport (PVD).

Inversiones de Massport en el Aeropuerto Logan

Massport controla, evalúa e implementa mejoras constantemente en el Aeropuerto Logan, en la seguridad, en la eficacia operativa y en el acceso desde y hacia el área metropolitana de Boston, mientras controla atentamente los efectos medioambientales de las operaciones del Aeropuerto Logan. Los proyectos del área de la terminal recientes y en curso están destinados a brindar una conectividad posterior a la seguridad sin inconvenientes entre las terminales y mejoras al sistema de proceso de pasajeros a través de las áreas de verificación de seguridad consolidadas. El acceso al Aeropuerto Logan y sus alrededores continúa siendo una prioridad. Massport continúa trabajando con la FAA para mejorar la seguridad en la zona de operaciones a través de una variedad de mejoras en la seguridad del área de las pistas (runway safety area, RSA) y de simplificaciones en la geometría del campo de aviación

Como se mencionó anteriormente, los efectos de la pandemia de la COVID-19 han precipitado una gran serie de cambios en el Aeropuerto Logan. Tanto la disminución de los pasajeros como los ingresos asociados en el 2020 y 2021 han requerido importantes ajustes en los servicios y en los cronogramas de los proyectos. Massport se ha centrado en ajustar los servicios para que se ajusten a los cambiantes niveles de pasajeros y en asegurar que esos cambios se hagan teniendo muy en cuenta la gestión de los impactos ambientales y operativos. En algunas áreas, se ajustaron los programas para reflejar las necesidades actuales y los impactos. Massport mantiene su compromiso de aplicar las estrategias de

mitigación relacionadas con el proyecto, como se documenta en el capítulo 9, *Medidas medioambientales beneficiosas y compromisos de mitigación del proyecto*.

Aspectos destacados y hallazgos clave del 2020 y 2021

Esta sección brinda un breve resumen de los hallazgos clave, por capítulo, en el Aeropuerto Logan en el 2020 y 2021. Se ofrece información adicional sobre las actividades del Aeropuerto en los capítulos subsiguientes. Esta sección también destaca las iniciativas de Massport para una mayor sustentabilidad a través de proyectos específicos e iniciativas con una **hoja de sustentabilidad** y resume el programa de sustentabilidad de Massport.

La certificación del secretario para el *EDR del 2018/2019*, que constituyó el alcance de este *EDR del 2020/2021*, reconoció que los niveles de actividad y las operaciones han disminuido debido a la pandemia de la COVID-19. Dada la anomalía de este calendario de informes, la MEPA ordenó que se presentara un EDR del 2020 y 2021 combinado para proporcionar una indicación más clara de las tendencias de crecimiento posteriores a la pandemia, junto con una metodología para la próxima previsión futura.

A partir de la presentación de este *EDR del 2020/2021*, el Aeropuerto Logan sigue recuperándose de la reducción de la demanda por la pandemia de la COVID-19. Los efectos de la COVID-19 en la industria de la aviación y el Aeropuerto de Logan siguen evolucionando. Como consecuencia, el *ESPR del 2022* proporcionará una previsión actualizada, reflejando la continua recuperación de la pandemia, así como los cambios de la industria que están reconfigurando la aviación en los Estados Unidos y a nivel internacional.

Niveles de actividad

Hasta el inicio de la pandemia de la COVID-19, el Aeropuerto Logan (y la industria de la aviación en general) había estado experimentando un fuerte crecimiento, en gran parte por las condiciones económicas positivas en la región de Boston, el bajo desempleo, una base económica diversa y fuerte, y la inversión continua en bienes raíces comerciales y residenciales, en ciencias biológicas en particular, en las finanzas, en la atención médica y en la educación superior. Debido a la pandemia de la COVID-19, los niveles de pasajeros y las operaciones del 2020 han disminuido drásticamente y los niveles de pasajeros del 2021 muestran un retorno gradual hacia los niveles del 2019.

Al igual que el resto de la industria aeroportuaria estadounidense, el Aeropuerto Logan ha experimentado un fuerte descenso de la actividad de las aerolíneas y del volumen de pasajeros en los dos últimos años. Los diferentes estados y regiones dentro de los EE. UU. han diferido en su respuesta a las restricciones de la COVID-19, lo que a su vez reflejó la voluntad de los consumidores de reanudar los viajes hacia y desde determinados mercados. El resultado neto es que la recuperación del transporte aéreo en el Aeropuerto Logan es un trabajo en curso. El Aeropuerto Logan se ha recuperado a un ritmo más lento si se compara con la recuperación general de pasajeros programados en los Estados Unidos, que recuperó el 72,7 % de sus niveles del 2019 en 2021.[15] Antes de la pandemia, el Aeropuerto Logan había tenido un promedio de crecimiento anual de pasajeros del 5,1 por ciento desde 2014, y anteriormente superaba el crecimiento general de pasajeros de los Estados Unidos del 4,0 por ciento anual para el mismo período de tiempo.

15 Oficina de Estadísticas del Transporte (Bureau of Transportation Statistics). https://www.bts.gov/covid-19

En el 2020, el mercado de pasajeros nacionales se redujo en un 68,5 por ciento a 10,7 millones en comparación con el 2019, pero repuntó en el 2021 a 20,0 millones de pasajeros en comparación con el 2020, lo que representa alrededor del 58,8 por ciento de los niveles anuales de pasajeros nacionales del 2019. Aunque la actividad de pasajeros nacionales alcanzó un máximo histórico de 34,1 millones en el 2019, los niveles de actividad de pasajeros nacionales del 2021 estuvieron por debajo de los niveles observados antes de 1998.

El número total de operaciones de aeronaves en el Aeropuerto Logan se redujo en un 51,6 %, pasando de 427 176 operaciones en 2019, que fue un máximo histórico desde el 2001, a 206 702 operaciones en el 2020. Luego, las operaciones en el 2021 aumentaron a 266 034, lo que representó una recuperación del 62,3 % de los niveles del 2019.

Consulte el Capítulo 2, *Niveles de actividad,* para obtener información adicional.

Planeación aeroportuaria

Massport continuamente mejora las instalaciones del Aeropuerto Logan para adaptarlo a los cambios de la demanda de pasajeros, de la actividad de las aeronaves, de las necesidades de las cargas y del acceso al transporte. En el Capítulo 3, *Planeación aeroportuaria*, Massport ha identificado proyectos de planeación e iniciativas prioritarios en las siguientes categorías:

- Transporte terrestre y estacionamiento.
- Terminales.
- Planificación de la zona de operaciones.
- Áreas de servicio.
- Amortiguadores del Aeropuerto y espacio abierto
- Energía, sustentabilidad y resiliencia

Como resultado de esta significativa reducción en la actividad del Aeropuerto y la dramática reducción de los ingresos durante el 2020 y el 2021, tanto Massport como las aerolíneas y otros locatarios del Aeropuerto han tenido que ajustar y reducir sus operaciones. También se ha ajustado el cronograma de varios proyectos y programas de Massport y de los locatarios del Aeropuerto. Massport sigue revisando el estado de sus proyectos/programas, y siguen produciéndose cambios o aplazamientos adicionales en respuesta a los niveles de actividad y los ingresos. Cabe destacar la revisión minuciosa y continua de los programas de acceso terrestre de Logan para que sigan estando en consonancia con los niveles de pasajeros y con los servicios de medios de transporte masivo (high-occupancy vehicle, HOV) que existen desde hace tiempo. A pesar de estos retos, Massport mantiene su compromiso de aplicar las estrategias de mitigación relacionadas con el proyecto.

Varios proyectos destinados a aliviar la congestión de las carreteras del Aeropuerto están en curso y se espera que estén terminados para el verano de 2023, a saber:

- Mejoras en las carreteras del Aeropuerto para aumentar la eficiencia y reducir la congestión.
- Mejoras en la calzada y en los cordones frente a la Terminal C (niveles de llegada y salida) para reducir la congestión en las horas pico y priorizar el acceso del HOV.

- Reubicación del tráfico de aplicaciones de transporte en coche para la Terminal B desde Central Garage al nivel de Salidas de la Terminal B.
- Construcción de carreteras para salir del nivel de partidas de la Terminal B que permitirán que el transporte público salga por su propio carril, en lugar de fusionarse con el transporte público destinado a las Terminales C y E.
- Instalación de un túnel de salida del estacionamiento de la Terminal B que permitirá que el tráfico salga por su propio carril en el nivel de llegadas, en lugar de fusionarse con el tráfico destinado a las Terminales C y E.
- Mejoras en las carreteras que conectan las Terminales B y C para mejorar la circulación, reducir la congestión y mejorar la seguridad.

Los proyectos del área de la terminal recientes y en curso brindan una conectividad y flexibilidad posterior a la seguridad sin inconvenientes entre las terminales y mejoras al sistema de proceso de pasajeros a través de las áreas de verificación de seguridad consolidadas.

Para mejorar la red de carreteras en el Aeropuerto, Massport está mejorando varios de los segmentos de carreteras e intersecciones del área de la terminal. En diciembre del 2019, Massport reubicó la mayoría de las áreas para dejar y recoger pasajeros de las aplicaciones de transporte en coche en Central Garage.

Desde la presentación del *EDR del 2018/2019*, Massport ha completado la revisión medioambiental estatal y/o federal de numerosos proyectos:

- **Proyecto de Estacionamiento del Aeropuerto Logan**, que añadirá 5000 espacios de estacionamiento comercial en el Aeropuerto Logan en ubicaciones que ya se usan para el estacionamiento. Los espacios de estacionamiento adicionales dependen de la aprobación de MassDOT y de la Agencia de Protección Medioambiental de los EE. UU. (EPA) de una modificación a la reglamentación del Congelamiento del Estacionamiento en el Aeropuerto Logan.[16] Los espacio adicionales tienen como objetivo reducir las modalidades para -recoger/dejar pasajeros perjudiciales para el medioambiente (es decir, recoger o dejar pasajeros en vehículos privados, en taxi, aplicaciones de transporte en coche o mediante servicios de limusinas con chofer). El proceso de revisión conjunto de la MEPA/NEPA se completó en enero del 2020. Actualmente, este proyecto está aplazado debido a la reducción en la actividad de los pasajeros asociada con la pandemia de la COVID-19.
- **El proyecto de la cubierta, conexiones y carreteras de la terminal C** recibió la aprobación medioambiental federal según la NEPA en noviembre del 2018. Como se describe en el *ESPR del 2017*, la construcción de este proyecto sustituirá y reconfigurará secciones de las carreteras elevadas que conectan las Terminales B y C. El reemplazo de la cubierta se completó en el 2021, con un programa ligeramente reducido respecto a lo previsto originalmente. El Conector de la Terminal C a la B se completó en 2022 y se prevé que las carreteras estén terminadas en el verano del 2023.
- **Proyecto de Mejora de la Pista 9-27 RSA,** que incluye la construcción de una cubierta con un sistema de detención de materiales de ingeniería (Engineered Materials Arresting System, EMAS)

16 Título 310, sección 7.30 del Código de Normas de Massachusetts, y título 40, sección 52.1120 del Código de Reglamentaciones Federales

en el extremo de la Pista 27, para cumplir con los requisitos de seguridad de la FAA. En agosto del 2021, se presentó un Formulario de Notificación Ambiental (Environmental Notification Forn, ENF) ante la oficina de la MEPA. El Informe Preliminar de Impacto Ambiental (Draft Environmental Impact Report, DEIR) se presentó en junio del 2022. Desde esta presentación, se está trabajando en el Informe de Impacto Ambiental (Environmental Impact Report, EIR) final (FEIR) y en la documentación de la NEPA.

Consulte el Capítulo 3, *Planeación aeroportuaria,* para obtener más información.

Transporte regional

En 2020, la actividad de pasajeros aéreos en la región de Nueva Inglaterra disminuyó significativamente y experimentó cierta recuperación en el 2021. A finales del 2021, se produjo una recuperación del 56 % de los niveles de pasajeros de 2019. Antes de la pandemia, casi 60 millones de pasajeros aéreos volaron a través del sistema de Nueva Inglaterra en 2019, un máximo histórico. Los 10 aeropuertos regionales (sin incluir el Aeropuerto Logan) de Nueva Inglaterra prestaron servicios a aproximadamente 6 millones y 11 millones de pasajeros aéreos en el 2020 y 2021, respectivamente, en comparación con aproximadamente 17,2 millones de pasajeros en el 2019.

En 2021, Bradley International (BDL), Rhode Island T.F. Green International (PVD), Portland International Jetport (PWM), Bangor International (BGR), Manchester-Boston Regional (MHT), Worcester Regional (ORH) y Hanscom Field (BED) recuperaron entre alrededor del 80 al 100 por ciento de sus operaciones de aeronaves totales del 2019. Mientras que los aeropuertos Tweed-New Haven (HVN), Burlington International (BTV) y Portsmouth International (PSM) superaron los niveles de operación de 2019, impulsados en parte por el crecimiento de la actividad chárter y de la aviación general. La recuperación de los servicios comerciales de pasajeros sigue siendo lenta en todos los aeropuertos regionales; sin embargo, varios aeropuertos dieron la bienvenida a nuevos servicios en el 2020 y 2021 ofrecidos por compañías de bajo y ultra bajo costo, como Allegiant Air, Avelo Airlines, Breeze Airways, Frontier Airlines y Sun Country Airlines.

Según el último estudio de impacto económico aeroportuario estatal de 2019, los tres aeropuertos de Massport, el Aeropuerto Logan, Worcester Regional Airport y Hanscom Field contribuyeron de manera significativa con la economía regional, generando aproximadamente USD 23,1 mil millones anualmente o el 94 por ciento de los beneficios de la economía general generados por el sistema de aeropuertos de Massachusetts.[17] Hanscom Field es un aeropuerto de relevo del Aeropuerto Logan y es el segundo aeropuerto con mayor actividad en Nueva Inglaterra.

Los niveles de actividad de pasajeros en el Aeropuerto Regional de Worcester disminuyeron aproximadamente un 78 por ciento en el 2020 en comparación con el 2019, seguido de un nuevo descenso en el 2021, cuando se suspendió temporalmente todo el tráfico comercial. En total, el Aeropuerto Regional de Worcester ha registrado un total de casi 890 000 pasajeros acumulados desde el 2013, cuando reintrodujo los servicios comerciales. jetBlue Airways, American Airlines y Delta Air Lines han reanudado los vuelos sin escalas a la mayoría de sus destinos antes de la pandemia a partir de finales del

17 División de Aeronáutica de MassDOT. 2019. *Actualización del estudio del impacto económico del aeropuerto estatal de Massachusetts*. https://www.mass.gov/files/documents/2019/03/25/AeroEcon_ImpactStudy_January2019.pdf.

2021. Massport continúa invirtiendo en Worcester Regional Airport. Junto con la ciudad de Worcester, Massport ya ha comenzado una inversión de USD 100 millones a 10 años para revitalizar y atraer operaciones comerciales en Worcester Regional Airport. En noviembre de 2022, Massport celebró el pasajero número 1 millón que utilizó el Aeropuerto Regional de Worcester desde la reanudación del servicio de pasajeros en el 2013.

En respuesta a la COVID-19, American Airlines, Delta Air Lines y jetBlue Airways suspendieron temporalmente el servicio de entrada y salida del Aeropuerto Regional de Worcester entre octubre del 2020 y julio del 2021. En agosto del 2021, el Aeropuerto Regional de Worcester volvió a dar la bienvenida al servicio sin escalas al Aeropuerto Internacional John F. Kennedy de Nueva York (JFK), que pasó a ser dos veces al día en diciembre del 2021. jetBlue Airways también reinició sus operaciones a Fort Lauderdale en octubre del 2021. American Airlines y Delta Air Lines reanudaron el servicio diario a Nueva York LaGuardia y Filadelfia, respectivamente, en noviembre del 2021. Aunque Delta Air Lines ya operaba vuelos a su centro de operaciones en Detroit antes de la pandemia, según los horarios publicados por OAG,[18] no queda ningún servicio sin escalas entre ambos aeropuertos.

Los viajes de todo el sistema de trenes Amtrak disminuyó de 16,8 millones de viajes de usuarios en el año fiscal (fiscal year, FY) 2020 a 12,2 millones de viajes en el FY 2021. En el FY 2020, el corredor noreste (Northeast Corridor, NEC) transportó más de 6,1 millones de pasajeros, alrededor de un 51 por ciento menos que el año anterior. En el FY 2021, el NEC transportó más de 4,4 millones de pasajeros en esos servicios, alrededor de un 28 por ciento menos que el año anterior.

Acceso terrestre

Después de la pandemia, se prevé que el Aeropuerto Logan siga siendo uno de los principales aeropuertos de los Estados Unidos en cuanto a la participación del medio HOV y de transporte público. Massport sigue comprometido con la promoción de numerosas opciones de HOV, transporte público y viajes compartidos para mejorar las carreteras dentro del Aeropuerto y las operaciones en las aceras, para aliviar las limitaciones de estacionamiento y para mejorar el servicio al cliente. Los hallazgos clave del 2020 y 2021 se resumen en las viñetas a continuación y se pueden encontrar detalles adicionales en el Capítulo 5, *Acceso terrestre desde y hacia el Aeropuerto Logan*.

- El promedio de las millas viajadas por vehículos (vehicle miles traveled, VMT) dentro del Aeropuerto en los días de semana disminuyeron alrededor de un 75 por ciento, del 2019 al 2020. Las VMT dentro del Aeropuerto en promedio los días de semana aumentaron del 2020 al 2021. El cambio en el tráfico promedio diario en el 2021 puede atribuirse principalmente a un repunte de la actividad de los pasajeros aéreos tras el cierre, al aumento en las operaciones para recoger/dejar pasajeros, a la carga y a los usos del aeropuerto no relacionados con la aviación. En función de los datos más recientes, la actividad del Aeropuerto y las VMT en el Aeropuerto tiende a ser mayor en el 2022 debido a la reducción de las restricciones de los viajes aéreos y los impactos de distanciamiento social de la COVID-19.
- Las transacciones de las aplicaciones de transporte en coche se redujeron significativamente de más de 7 millones en el 2019 a poco más de 2 millones en el 2020 debido a las restricciones de viaje por

18 Cronogramas publicados hasta septiembre del 2022.

la COVID-19 y las posibles preocupaciones de seguridad de salud asociadas con los vehículos compartidos. A medida que los niveles de pasajeros aumentaron en el 2021, el número de usuarios de viajes compartidos también aumentó. Sin embargo, el número de usuarios sigue siendo significativamente inferior a los niveles anteriores a la COVID (2019 y anteriores). Debido a los impactos de la COVID-19, el número de limusinas con chofer y de plazas de furgonetas programadas que llegan al Aeropuerto se redujo en casi un 64 % del 2019 al 2021. Los viajes en taxis disminuyeron un 80 por ciento en el 2020 en comparación con el 2019, pero aumentaron entre el 2020 y el 2021. La cantidad de pasajeros de la línea Blue de la Autoridad de Transporte de la Bahía de Massachusetts (Massachusetts Bay Transportation Authority, MBTA) disminuyó en un 58 por ciento entre el 2019 y el 2020, y aumentó en el 2021 en comparación con el 2020.

- Massport tiene el objetivo de alcanzar el 35,5 por ciento de la modalidad de HOV compartida para el 2022 y el 40 por ciento para el 2027. Según los resultados de la *Encuesta de acceso terrestre de pasajeros aéreos del Aeropuerto Logan del 2019*, la modalidad de HOV compartida alcanzó el 40,4 por ciento, superando tanto los objetivos a corto como a largo plazo. La COVID-19 ha tenido una serie de impactos en el transporte terrestre, particularmente en el uso de las modalidades de HOV de acceso terrestre. Si bien se prevé que la modalidad de HOV compartida disminuirá como resultado de la COVID-19 a corto plazo, Massport sigue comprometido con los objetivos de la modalidad de HOV compartida en el futuro. Los resultados de la encuesta de acceso terrestre de pasajeros aéreos de 2022 se presentarán en el *ESPR del 2022*.

Estrategia para el acceso terrestre

Massport cuenta con una estrategia integral múltiple de reducción de viajes de larga data para diversificar y mejorar las opciones de transporte terrestre para los pasajeros y para los empleados que viajan desde y hacia el Aeropuerto Logan. La estrategia está diseñada para ofrecer a los pasajeros la oportunidad de elegir entre HOV, transporte público y opciones de viajes compartidos que son prácticas y confiables, y que reducen los impactos medioambientales y en la comunidad.

La estrategia de Massport también tiene como objetivo brindar suficiente estacionamiento dentro del Aeropuerto para los pasajeros aéreos que eligen la modalidad de acceso en automóvil y/o que tienen opciones de HOV limitadas. En 2017, el Departamento de Protección Medioambiental de Massachusetts (MassDEP) enmendó el Congelamiento del Estacionamiento en el Aeropuerto Logan para permitir un aumento de hasta 5000 espacios de estacionamiento comercial dentro del aeropuerto, lo que permite la construcción de estacionamientos adicionales para reducir el uso de las modalidades para recoger/dejar pasajeros y para aliviar las condiciones de estacionamiento limitado dentro del aeropuerto. En enero del 2020, Massport recibió el certificado FEIR de la Secretaría de la EEA, completando el proceso de revisión ambiental para la construcción de 5000 plazas de estacionamiento adicionales. Aunque el proyecto ha completado el proceso de revisión medioambiental, la construcción de estas plazas de estacionamiento adicionales se ha aplazado hasta que los niveles de actividad de los pasajeros se recuperen lo suficiente. El *ESPR del 2022* brindará un estado actualizado del proyecto.

Un interés de larga data de Massport es abordar la congestión de las carreteras dentro del Aeropuerto con una combinación de cambios en las políticas y con mejoras en la infraestructura. Es importante aliviar la congestión de la zona de las terminales para que las operaciones en tierra sigan siendo seguras y eficientes, y para reducir los impactos ambientales. Mejorar las opciones de transporte multimodal, y

brindar una infraestructura moderna y flexible es una forma mediante la cual un aeropuerto puede reducir las emisiones de gases de efecto invernadero (greenhouse gas, GHG) y de mejorar su huella ecológica.

Massport reconoce la importancia de proporcionar servicios de HOV seguros y confiables desde y hacia el Aeropuerto, y tiene el objetivo de alcanzar el 40 por ciento de la modalidad de HOV compartido para el 2027. Comprender el crecimiento del uso de las aplicaciones de transporte en coche y su impacto en la congestión de las carreteras regionales y de las zonas de las terminales es esencial para gestionar el volumen de tráfico dentro del Aeropuerto y para promover los servicios de HOV como una alternativa viable y atractiva.- Para solucionar los problemas de congestión causados por las aplicaciones de transporte en coche previos a la pandemia, Massport reconstruyó la planta baja del Central/West Garage para facilitar la bajada de pasajeros (entre las 10:00 de la mañana y la medianoche) y la recogida (a todas horas). Este cambio en el servicio se completó en diciembre de 2019.

Durante el 2020 y 2021, los efectos de la pandemia se tradujeron en un menor número de pasajeros y empleados que viajaban hacia y desde el Aeropuerto Logan y en una menor congestión de las carreteras tanto en Boston como en el área metropolitana. Además, el interés de la comunidad por utilizar los servicios de transporte HOV, como los autobuses, el servicio de transporte público rápido y el ferrocarril suburbano, siguen disminuidos por las preocupaciones relacionadas con la COVID-19, la reducción o las interrupciones en el servicio. En ese contexto, Massport sigue evaluando y planificando la recuperación de la actividad de los pasajeros aéreos y mantiene su compromiso de implementar la amplia gama de estrategias de acceso terrestre y de reducción de viajes. Massport continúa revisando cuidadosamente los niveles de actividad dentro y fuera del Aeropuerto, y ajustará sus programas de acceso terrestre para alinearlos con los niveles de pasajeros aéreos. El cronograma de las mejoras del HOV y de los accesos terrestres se ha ajustado y se seguirá ajustando debido a las condiciones actuales. Los próximos EDR y ESPR brindarán actualizaciones detalladas sobre todos los ajustes a los servicios y los niveles de actividades.

Massport evalúa continuamente sus estrategias y programas destinados a mejorar y, donde sea necesario, expandir los servicios de HOV hacia y desde el Aeropuerto Logan, incluida la continua inversión en las instalaciones y el servicio de Logan Express. Las iniciativas descritas a continuación pueden mejorar las operaciones en las carreteras, así como la calidad de las emisiones atmosféricas. Las siguientes medidas se implementaron o siguen en análisis:

- Se continuarán fomentando los viajes en Logan Express al expandir el estacionamiento, la frecuencia y a través de mejoras en las instalaciones.
- **Mejoras al servicio suburbano de Logan Express**
  - Aumentar el servicio de Braintree Logan Express de dos a tres viajes por hora (implementado en mayo del 2019, pero reducido a un servicio por hora en marzo del 2020 debido a los impactos de la COVID-19. En julio de 2021, el servicio se reanudó con un servicio cada media hora).
  - Agregar unos 1000 espacios más a Framingham Garage (el permiso se completó en el 2020, pero la construcción está aplazada).
  - Realizar campañas de publicidad para respaldar la estrategia de Logan Express y para aumentar la cantidad de pasajeros.

- Implementar la emisión de boletos electrónicos para Logan Express (completado en marzo del 2021).
- Evaluar las nuevas ubicaciones suburbanas de Logan Express, con un plan para abrir al menos un sitio nuevo. Peabody Logan Express se reubicó en febrero de 2022. Massport está evaluando las oportunidades para continuar la expansión de la capacidad y el servicio.
- Explorar las conexiones de destino final de las aplicaciones de transporte en coche.
- Continuar monitoreando la capacidad de estacionamiento en todos los sitios de Logan Express.

- **Línea Silver de la MBTA**
  - Massport continúa su colaboración con la MBTA para ofrecer viajes gratuitos de la Silver Line en el Aeropuerto. La reducción de los tiempos de permanencia y la agilización de los desplazamientos a través de la zona de la terminal llevaron a Massport a prorrogar indefinidamente el programa de tarifas gratuitas. Massport adquirió ocho autobuses de la línea Silver y los opera la MBTA, y Massport paga los costos operativos. En 2018, Massport financió el reacondicionamiento de cuatro autobuses de la línea Silver. Massport comprará ocho autobuses nuevos de la línea Silver como parte de una próxima adquisición (2023) de la MBTA.

- **Servicio suburbano de Logan Express**
  - Cambiar la ubicación para recoger/dejar pasajeros de la estación Copley a Back Bay (implementado en el 2019).
  - Descuento en la tarifa de un solo trayecto de USD 7,50 a USD 3,00 (implementado en el 2019).
  - Proporcionar un servicio gratuito desde el Aeropuerto Logan (implementado a principios del 2019).
  - Brindar estado de prioridad en la cola de seguridad para los usuarios de Logan Express Back Bay (implementado en el 2019; este servicio estuvo suspendido debido a la COVID-19, pero se restableció en octubre de 2022).
  - Campañas publicitarias para respaldar el aumento de los viajes (en curso).
  - Implementar los boletos electrónicos de Logan Express (implementado tras la reapertura en octubre de 2022).
  - Explorar un segundo servicio urbano de Logan Express.
- **Plan de manejo de aplicaciones de transporte en coche**
  - Facilitar el flujo de pasajeros y los viajes compartidos al trasladar la actividad de recoger/dejar pasajeros de las aplicaciones de transporte en coche a nuevas áreas especialmente destinadas a tal fin en Central Garage (completado).

- Implementar el flujo constante de pasajeros[19] de las aplicaciones de transporte en coche para que los conductores que dejan un pasajero puedan retirarse con un pasajero más fácilmente (completado).
- Introducir incentivos para los viajes compartidos de las aplicaciones de transporte en coche para reducir los vehículos de las aplicaciones de transporte en coche en los ingresos/las salidas al aumentar la cantidad de pasajeros en los vehículos (completado).
- Adoptar una nueva estructura para las tarifas de las aplicaciones de transporte en coche para respaldar las estrategias de los HOV, alentar los viajes compartidos y reducir la congestión en los ingresos/las salidas (completado).
- Optimizar las operaciones de las aplicaciones de transporte en coche dentro del Aeropuerto a través del informe de datos, de las herramientas de cumplimiento y de los nuevos productos de las aplicaciones de transporte en coche (continúa).

- **Mejoras en la infraestructura**
  - Massport continuará evaluando e identificando la necesidad de nuevas modificaciones a la infraestructura como complemento a los cambios en las políticas para permitir que las áreas de las carreteras y de las aceras continúen funcionando adecuadamente y para minimizar el tiempo que los vehículos están parados con los motores encendidos y las emisiones asociadas. Se implementarán los cambios según sean necesarios.

Ruido

Massport se esfuerza por minimizar los efectos del ruido de las operaciones del Aeropuerto Logan en sus vecinos mediante diferentes programas, procedimientos, estudios y demás herramientas para la disminución del ruido. En el Aeropuerto Logan, Massport implementa uno de los programas para la disminución del ruido más antiguos y amplios de cualquier aeropuerto del país. El programa integral de disminución del ruido incluye una Oficina para la Disminución del Ruido especializada, un sistema de monitoreo del ruido y de operaciones (Noise and Operations Monitoring System, NOMS) de avanzada, programas de protección acústica para viviendas y escuelas, restricciones de horarios y de pistas para los aviones más ruidosos, procedimientos de prueba de motores en tierra y rastreo de vuelos diseñado para optimizar las operaciones sobre el agua (especialmente durante las horas de la noche). La población puede dejar asentadas quejas por ruido por teléfono o en línea a través del sitio web de Massport.[20]

Los hallazgos clave se resumen en las viñetas a continuación y se pueden encontrar detalles adicionales en el Capítulo 6, *Disminución del ruido*.

- Massport sigue buscando financiación para mitigar el ruido de las propiedades que pueden participar en su Programa de Aislamiento Acústico Residencial (Residential Sound Insulation Program, RSIP). En 2021, Massport actualizó su mapa de exposición al ruido (Noise Exposure Map, NEM) y está iniciando un nuevo programa para aislar acústicamente las viviendas que cumplan los requisitos y reevaluar el aislamiento acústico en las viviendas tratadas antes de 1993. Hasta la

19 El flujo constante de pasajeros permite que los conductores que dejan pasajeros instantáneamente recojan otros pasajeros sin la necesidad de dar vueltas en el Aeropuerto o de retirarse vacíos.

20 Massport. Quejas por ruidos. http://www.massport.com/logan-airport/about-logan/noise-abatement/complaints/.

fecha, Massport ha proporcionado aislamiento acústico a un total de 36 escuelas y 11 515 viviendas, con una inversión de más de 170 millones de dólares desde el inicio del programa.

- Actualmente, Massport está trabajando con la FAA para, posiblemente, abordar problemas con la primera generación de ventanas de aislación acústica. En enero del 2020, el gerente (Chief Executive Officer, CEO) de Massport envió una carta al administrador adjunto de la FAA solicitando que Massport y la FAA trabajen juntos para abordar el retratamiento de las viviendas a las que se les había realizado aislamiento acústico durante los primeros años del programa para renovar las viviendas elegibles con materiales más nuevos, más eficaces y más duraderos. El administrador adjunto respondió que la FAA está explorando circunstancias limitadas en las que Massport podría ser capaz de mitigar las viviendas que habían sido mitigadas antes de que la FAA emitiera las primeras normas de aislamiento acústico en 1993. El primer paso de este proceso fue que Massport presentara un NEM del RSIP actualizado. La FAA aceptó el 20 de diciembre de 2021 el NEM del 2020 que fue presentado por Massport y Massport está en proceso de reiniciar su RSIP. Massport seleccionó un equipo de consultores que inspeccionará las áreas elegibles del programa para identificar las propiedades potencialmente elegibles que cumplen con los nuevos criterios de la FAA para un programa piloto. En 2022, Massport solicitó y obtuvo la aprobación de una subvención inicial de la FAA para financiar la fase inicial del nuevo RSIP. Consulte el Apéndice H, *Disminución del ruido* para obtener más información.
- La mezcla de flota en el Aeropuerto Logan sigue estando compuesta por tipos de aeronaves con la tecnología más silenciosa disponible (la Fase 5 es la más silenciosa). Alrededor del 29 % de las operaciones del 2020 y 2021 se llevaron a cabo en aeronaves que cumplían los requisitos de la certificación de la fase 5, el 69 % cumplía la certificación de la fase 4 y el 2 o 3 % restante solo cumplía la certificación de la fase 3. Debido a la pandemia, varias compañías aéreas aceleraron la retirada de modelos de aviones más antiguos, más ruidosos y menos eficientes, como los Airbus A330-200/300 y A340, los Boeing 747, 757 y 767, los McDonnell Douglas MD-88, los Embraer 190 y los pequeños jets regionales (regional jet, RJ) Bombardier CRJ200. Los efectos de los cambios de la flota de aerolíneas en el entorno acústico del Aeropuerto Logan empezaron a verse en el 2021 y deberían ser más evidentes en los años siguientes.
- Massport completó un esfuerzo de varios años con el Instituto Tecnológico de Massachusetts (Massachusetts Institute of Technology, MIT) y la FAA para identificar las oportunidades de reducir el ruido a través de cambios en los procedimientos de navegación basados en el rendimiento (performance-based navigation, PBN) y modificaciones en el rendimiento del vuelo. Este es el primer programa en el país entre la FAA y un operador aeroportuario para entender mejor lo que implica la PBN y para evaluar las estrategias para abordar las preocupaciones de la comunidad.
- Las operaciones nocturnas representaron el 13 por ciento del total de operaciones en el 2020 y el 2021. Como reflejo del descenso global de las operaciones, el total de vuelos nocturnos (comerciales y de carga) se redujo de una media de 195 por noche en 2019 a 76 por noche en 2020 y 98 por noche en 2021. Mientras que las operaciones nocturnas en los aviones comerciales de pasajeros disminuyeron, las operaciones nocturnas de carga aumentaron del 2019 al 2020, muy probablemente debido a una mayor demanda de envío durante la pandemia. La mayoría (alrededor del 86 por ciento en el 2020 y el 78 por ciento en el 2021) de las operaciones nocturnas se produjeron antes de la medianoche o después de las 5 a. m.

- El número total de personas que residen dentro del contorno de nivel sonoro medio día-noche (day-night average sound level, DNL) de 65 decibelios (dB) del 2020 (804 personas) representa una disminución de casi el 91 % en comparación con la estimación del 2019 (8665 personas). La estimación de la población de 2021 dentro del contorno DNL 65 ascendió a 2497 personas, lo que supone alrededor del 29 % del 2019. El principal factor que influye en el tamaño de los contornos DNL es el reducido número de operaciones aéreas.
- Los contornos DNL del 2021 tienen una forma similar a los contornos DNL del 2019, pero con un tamaño reducido debido a la reducción de las operaciones. Los contornos DNL del 2020 tienen una forma ligeramente diferente y son algo más pequeños que los del 2021 sobre East Boston y Winthrop. La población dentro del contorno DNL de 65 dB en 2020 se encuentra principalmente en Revere, Winthrop (Point Shirley) y Boston (Orient Heights). En comparación con el 2020, el contorno DNL del 2021 incluye más viviendas, y por tanto mayor población, en cada una de esas zonas, así como algunas en East Boston (Eagle Hill).

Estrategia para el ruido

La base del programa contra el ruido de Massport son las *Normas y Reglamentaciones para la disminución del ruido en el Aeropuerto Logan*[21] (las Normas contra el ruido), que rigen desde 1986. La Oficina para la Diminución del Ruido de Massport se encarga de implementar medidas para la disminución del ruido y de monitorear, generalmente, las quejas de la comunidad y otros aspectos de los efectos del ruido de las operaciones del Aeropuerto Logan.

Massport está enfocado en las siguientes iniciativas para la disminución del ruido:

- **Asociaciones con aerolíneas y con la FAA**
  - Massport alienta la modernización de la familia de aerobuses A319/320/321 de aeronaves con generadores en vórtice, lo que reduce el ruido tonal al acercarse. En octubre del 2018, jetBlue Airways (la aerolínea con mayor cantidad de operaciones en el Aeropuerto Logan) anunció planes para modernizar su flota de aerobuses más antigua con generadores de vórtices. Este movimiento refleja la asociación entre Massport y las aerolíneas para reducir el ruido de las aeronaves para beneficiar a las comunidades circundantes. A medida que las aerolíneas modernizan las aeronaves y hacen la transición a los nuevos modelos de la familia A320, se prevé que la cantidad de aeronaves que operan en el Aeropuerto Logan sin generadores de vórtice disminuya.

Imagen de un dispositivo generador de vórtice por puerto

21 Las Normas y Reglamentaciones para la Disminución del Ruido en el Aeropuerto Internacional Logan, vigentes a partir del 1 de julio de 1986, se codifican como código 740 de las normas de Massachusetts (Code of Massachusetts Regulations, CMR) 24.00 et seq (también denominadas Normas contra el ruido).

- El 7 de octubre del 2016, Massport y la FAA firmaron un memorando de entendimiento (Memorandum of Understanding, MOU)[22] para darle un marco al proceso para el análisis de oportunidades para reducir el ruido mediante cambios o enmiendas a la PBN, incluida la navegación de área (RNAV). Esta colaboración es el primer programa en el país entre la FAA y un operador aeroportuario para entender mejor lo que implica la PBN y evaluar las estrategias para abordar las preocupaciones de la comunidad. El MIT es el líder técnico. El Bloque 1 se completó a finales del 2017 y se hicieron recomendaciones a la FAA. El MIT completó el informe del bloque 2, que se publicó en diciembre de 2021. En enero del 2022, el CAC de Massport propuso dos de los procedimientos para su estudio y aplicación por parte de la FAA. El 19 de enero del 2022, Massport presentó una solicitud ante la FAA para la revisión e implementación de dos procedimientos del bloque 2 en el Aeropuerto Logan.
- La flota que opera en el Aeropuerto Logan está compuesta en un 69 por ciento por aeronaves de fase 4 y en un 29 por ciento por aeronaves de fase 5 (las de fase 5 son las más silenciosas), muy por encima de los motores de fase 3, exigidos como mínimo por la FAA.
- Massport continúa prohibiendo el uso de la pista 4L para las salidas y de la pista 22R para los arribos desde las 11:00 p. m. hasta las 6:00 a. m., maximizando las operaciones sobre el agua tarde a la noche, usando las pistas 15R y 33L, y restringiendo el aumento del volumen de los motores y el uso de las unidades de potencia auxiliar (auxiliary power units, APU) a la noche.
- Massport sigue fomentando el uso voluntario del rodaje con motor reducido cuando es apropiado y seguro.
- Massport continúa mejorando el sistema de monitoreo del ruido y de operaciones (Noise and Operations Monitoring System, NOMS). Massport actualizó el sistema en 2019 y sigue invirtiendo en el mantenimiento del sistema, incluida la instalación de nuevos monitores de campo e infraestructura donde sea necesario. La sustitución total de los equipos de monitoreo del ruido en 29 emplazamientos alrededor del Aeropuerto Logan se completó en agosto de 2021.

- **Programa para la protección contra el sonido**

  - Massport cuenta un de los programas de protección contra el sonido en viviendas y en escuelas más amplio del país. Al día de la fecha, Massport ha instalado protección acústica en 5467 viviendas, incluidas 11 515 unidades de viviendas y 36 escuelas en East Boston, en Roxbury, en Dorchester, en Winthrop, en Revere, en Chelsea y en South Boston. Desde el inicio del programa, se invirtieron más de USD 170 millones.
  - Aproximadamente, el 8 por ciento de los solicitantes también eligieron la opción de Habitación de preferencia que permite que el propietario señale una habitación (generalmente un dormitorio o la sala de estar) para el tratamiento con acústica adicional.

22 Massport. 7 de octubre del 2016. *Massport y la FAA trabajan para reducir el ruido de los sobrevuelos (Massport and FAA Work to Reduce Overflight Noise)* https://www.massport.com/news-room/news/massport-and-faa-work-to-reduce-overflight-noise/.

Calidad del aire/Reducción de emisiones

Antes de la pandemia, las emisiones totales de todas las fuentes relacionadas con el Aeropuerto Logan eran menores a las de hace una década, a excepción de los óxidos de nitrógeno (NO_x). Esta tendencia hacia la disminución es congruente con el objetivo de larga data de Massport de adaptarse a las demandas del aumento de pasajeros y de los niveles de actividad de las cargas con menos operaciones de aeronaves y menos emisiones en donde sea posible.

La reducción de las operaciones de las aeronaves y de los viajes de acceso terrestre relacionados con los pasajeros en el 2020 y 2021 durante la pandemia, en comparación con el 2019, dio lugar a una reducción de las emisiones de contaminantes atmosféricos para los que existen normas nacionales de calidad del aire ambiente (National Ambient Air Quality Standards, NAAQS), así como a una reducción de las emisiones de los precursores de los contaminantes regulados por las NAAQS, de las emisiones de gases de efecto invernadero (green house effect gases, GHG) y de los contaminantes atmosféricos peligrosos (hazardous air pollutants, HAP), en comparación con los niveles de emisión estimados para Logan para los años 1999, 2000 y 2010 hasta 2019.- Los cambios en las emisiones del 2020 y 2021 también son el resultado de los cambios en la flota de aviones que operan en el Aeropuerto Logan y de las iniciativas de reducción de emisiones de Massport que han reducido las emisiones. A pesar de la reducción del número de operaciones y de pasajeros, Massport mantiene su compromiso de aplicar estrategias de reducción de emisiones.

Massport confeccionó listados de emisiones para el 2020 y el 2021 para los criterios de los siguientes contaminantes: monóxido de carbono (CO), partículas (particulate matter, PM) y compuestos orgánicos volátiles (volatile organic compounds, VOC), así como GHG y óxidos de nitrógeno (NO_x). Los hallazgos clave de estos listados de emisiones incluyen los siguientes:

- Las emisiones totales modeladas para el 2020 de COV, NO_X, CO y PM disminuyeron con respecto al 2019 en aproximadamente un 58 %, 54 %, 59 % y 47 %, respectivamente. Esto se debe principalmente a la disminución de los niveles de actividad de los pasajeros y de las operaciones de las aeronaves debido a la pandemia de la COVID-19.
- Las emisiones totales modeladas para el 2021 de COV, NO_X, CO y PM disminuyeron aproximadamente un 45 por ciento, 42 por ciento, 48 por ciento y 23 por ciento, respectivamente, de los niveles del 2019. Similar al 2020, esto se debe principalmente a la disminución de los niveles de actividad de los pasajeros y de las operaciones de las aeronaves debido a la pandemia de la COVID-19.
- Las emisiones de GHG asociadas con el Aeropuerto Logan en el 2020 y 2021 son menos de un 1 por ciento de las emisiones calculadas más recientemente en todo el estado. El total de las emisiones de GHG del Aeropuerto Logan (es decir, alcance 1, 2 y 3) disminuyó del 2019 al 2020 en aproximadamente un 60 por ciento, pero aumentó del 2020 al 2021. Sin embargo, las emisiones de GHG del 2021 siguen por debajo de las emisiones del 2019 previo a la pandemia.

Efecto de la tecnología de los motores de las aeronaves en el NO_x

Las emisiones de las aeronaves siguen representando la mayor fuente (95 %) de NO_x en el Aeropuerto Logan, mientras que el resto corresponde a equipos de servicio en tierra (ground service equipment, GSE), otras fuentes y vehículos de motor (aproximadamente el 5 %). Massport no tiene ningún control sobre las emisiones de las aeronaves, que representan la gran mayoría de las emisiones totales del Aeropuerto.

Para reducir el uso de combustible y las emisiones, los diseñadores y los fabricantes de los motores de las aeronaves siguen trabajando para producir motores que ahorren más combustible (es decir, que quemen menos combustible). Esto se logra mejorando el desempeño del motor con tecnologías de combustión mejoradas, mayor poder de propulsión y menor desgaste del motor. También se están diseñando aeronaves para disminuir la quema de combustible con avances en la aerodinámica de las alas y del cuerpo de las aeronaves, con materiales de aleaciones livianas y mejores medios de navegación. Se prevé que estas nuevas tecnologías y la reducción en la quema de combustible reduzcan las emisiones, reduzcan el ruido y moderen el crecimiento de las emisiones de NO_x en el futuro.

Estrategia para la calidad del aire

La estrategia para el manejo de la calidad del aire de Massport para el Aeropuerto Logan se enfoca en la reducción de las emisiones de las fuentes relacionadas con el Aeropuerto, además de continuar innovando en formas de lograr las reducciones de las emisiones en todo el Aeropuerto. Debido a que Massport no tiene un control directo sobre las operaciones de las aeronaves ni de las elecciones de las flotas de las aerolíneas, continúa enfocándose en las áreas que Massport sí controla o sobre las que tiene posibilidades de ejercer influencia. La estrategia para el manejo de la calidad del aire de Massport para el Aeropuerto Logan se enfoca en la reducción de las emisiones de las fuentes relacionadas con el Aeropuerto, además de continuar innovando en formas de lograr las reducciones de las emisiones en todo el Aeropuerto. Massport ha establecido una cantidad de metas y objetivos para abordar las emisiones atmosféricas de las operaciones del Aeropuerto, lo que incluye la reducción de las emisiones de los GSE y de la flota de vehículos de Massport. Massport está enfocado en las siguientes iniciativas:

- **Net Zero Roadmap**
    - Como se comenta más adelante, en el 2022, Massport publicó *Net Zero Roadmap by 2031*, una estrategia de reducción de emisiones para toda la Autoridad, cuyo objetivo es esforzarse por alcanzar las emisiones netas de GHG en 2031 bajo su control directo, para el 75º aniversario de Massport. En el *ESPR del 2022,* se informará sobre la implementación de ese programa, que se resume en la sección del Programa de Sostenibilidad y Resiliencia más adelante. Las vías clave para llegar a la emisión de carbono cero incluyen la eficiencia energética de los edificios, la transición a los vehículos eléctricos, la adquisición gradual de un suministro de energía sostenible y una serie de medidas para ayudar a permitir la reducción de emisiones por parte de nuestros locatarios y socios comerciales.

- **Brindar infraestructura y fomentar prácticas que respalden las reducciones de las emisiones de las aeronaves.**
  - Massport brinda aire preacondicionado (pre-conditioned air, PCA) y energía de 400 hertz (Hz) en todas las puertas de contacto de las aeronaves para reducir el tiempo en que las aeronaves tienen los motores encendidos y el uso de APU.
  - Massport fomenta los procedimientos de carreteo con un solo motor, cuando es seguro, por parte de las aerolíneas para reducir tanto el ruido como las emisiones atmosféricas.
  - Instalación de estaciones de carga eléctrica en la zona de operaciones para apoyar el uso de GSE eléctricos alimentados por baterías, como remolcadores de aeronaves y cargadores de cinta.
- **Maximizar el uso del HOV y reducir los viajes en autos con un solo pasajero, especialmente los viajes para recoger/dejar pasajeros, y el uso de vehículos privados por parte de los pasajeros desde y hacia el Aeropuerto.**
  - Massport implementa una amplia estrategia para el HOV y mejoras en el transporte terrestre (consulte la sección anterior, Estrategia de acceso terrestre, para obtener detalles).
- **Reducir las emisiones de las flotas que operan en el Aeropuerto Logan**
  - Massport está facilitando el reemplazo del GSE que funciona con gasolina y con diésel por GSE completamente eléctricos (electric GSE, eGSE) (según la disponibilidad comercial) mediante el apoyo de la instalación de la infraestructura para la carga.
  - En 2018, Massport recibió una subvención del Programa Voluntario de Aeropuertos de Bajas Emisiones (Voluntary Airport Low Emission, VALE) de la FAA de USD 1 600 000 para la infraestructura de carga en la Terminal B. Massport aportó USD 626 000 en fondos de contrapartida para instalar 50 estaciones de carga de eGSE. En el 2019, a través del mismo programa, Massport recibió USD 3 200 000 para la infraestructura de carga en la Terminal C. Massport contribuyó con USD 953 000 a la instalación de 42 estaciones de carga de eGSE.
  - En 2019, Massport, en colaboración con jetBlue Airways, recibió USD 445 000 a través del programa de subvención Volkswagen Diesel Settlements & Environmental Mitigation Open Solicitation del Departamento de Protección Ambiental de Massachussets (MassDEP). La subvención, destinada a reducir las emisiones de NO_X y de GHG, apoyará la sustitución de 31 piezas de GSE por nuevos eGSE y se instalarán cuatro estaciones de carga de eGSE en la Terminal C. United Airlines también solicitó esta subvención de forma privada y recibió USD 280 000.
  - En el 2019 Massport recibió de la EPA, en el marco de la Ley de Reducción de Emisiones Diésel (Diesel Emission Reduction Ac, DERA), una subvención de USD 990 000 para sustituir 44 GSE a diésel por tractores de equipaje, cargadores de cintas y remolcadores de retroceso totalmente eléctricos. Los propietarios de GSE del Aeropuerto Logan contribuirán con USD 1 210 000.

  - En el 2020, Massport recibió una subvención a través del VALE de la FAA para la infraestructura de carga en la Terminal E y en el edificio 14 de Signature Aviation para instalar 10 estaciones de carga de eSGE.
  - Massport está colaborando con el Centro de Energía Limpia de Massachusetts (Massachusetts Clean Energy Center, MassCEC) para estudiar las oportunidades que permitan la conversión de la flota de vehículos de alquiler (RideApp, Rental Car Taxi y limusinas) que prestan servicios en Logan a la transición a los vehículos eléctricos. A principios del 2022, MassCEC proporcionó una subvención para iniciar este trabajo y proporcionar algunos fondos para aumentar la infraestructura de carga de vehículos eléctricos (electric vehicle, EV) de Logan

- **Brindar infraestructura para respaldar los combustibles alternativos, incluido el gas natural comprimido (GNC) y la electricidad**
  - Massport se ha comprometido a aumentar la disponibilidad de estaciones de carga de vehículos eléctricos. Actualmente, hay 135 puertos de recarga en el perímetro fuera de la seguridad y 286 en el área exclusiva para pasajeros en todo Massport.
  - Massport continúa operando una de sus estaciones minoristas de GNC más grandes de Nueva Inglaterra, que está abierta al público. En el 2020 y 2021, la estación dispensó aproximadamente 12 339 y 10 691 galones equivalentes de gasolina al mes para los vehículos de Massport, respectivamente.
- **Reducir las emisiones de los vehículos de la flota de Massport**
  - Massport continúa operando y aumentando su flota de vehículos con combustible alternativo (alternative fuel vehicle, AFV)/vehículos con energía alternativa (alternative power vehicle, APV) en los autobuses de enlace dentro del Aeropuerto. Massport también cuenta con una política de adquisición de vehículos que exige que se tengan en cuenta los AFV cuando se realicen compras.
- **Reducir emisiones asociadas a los edificios de Massport, incluidas las necesidades energéticas**
  - Massport asume el compromiso de alcanzar la certificación Leadership in Energy and Environmental Design (LEED®) para los edificios elegibles, según corresponda y apunta a LEED Silver o más.
  - Massport continúa invirtiendo en instalaciones de energía renovable dentro del Aeropuerto (solar/eólica).

Cumplimiento y manejo medioambiental/Calidad del agua

El enfoque de Massport en cuanto al manejo medioambiental y al cumplimiento es un componente clave de su compromiso con la sustentabilidad y con las prácticas responsables en el Aeropuerto Logan. Mediante el monitoreo y la documentación, Massport evalúa el desempeño medioambiental y desarrolla, implementa, evalúa y mejora las políticas y los programas continuamente. Massport promueve las prácticas medioambientales apropiadas a través de la prevención de la contaminación y de las medidas de descontaminación. Massport también trabaja estrechamente con los locatarios y con el personal de

operaciones del Aeropuerto Logan para intentar mejorar continuamente el cumplimiento medioambiental. Los hallazgos clave de este EDR incluyen los siguientes:

- En 2020, el 100 por ciento de las muestras de aguas pluviales cumplieron con los requisitos del permiso del Sistema Nacional de Eliminación de Descarga de Contaminantes (National Pollutant Discharge Elimination System, NPDES) y en el 2021, el 99 por ciento cumplieron.
- Massport actualiza y mantiene anualmente su Plan de Prevención de la Contaminación del Agua Pluvial (Stormwater Pollution Prevention Plan, SWPPP) para el Aeropuerto Logan.
- Massport continuá evaluando, descontaminando y llevando sus sitios del Plan de Contingencia de Massachusetts a un cierre reglamentario.
- En el 2020, se informaron cuatro derrames que afectaron dos bocas de tormenta. En el 2021, se informaron cuatro derrames que no afectaron ninguna boca de tormenta.

Para obtener información adicional, consulte el Capítulo 8, *Cumplimiento y manejo medioambiental/Calidad del agua*.

Programa de sustentabilidad y resiliencia

Massport está comprometido con un programa de sustentabilidad sólido. La sustentabilidad ha redefinido los valores y los criterios para medir el éxito organizacional al usar un enfoque de resultado triple que toma en cuenta el bienestar económico, medioambiental y social. Aplicar este enfoque a la toma de decisiones es una manera práctica de optimizar el capital económico, medioambiental y social. Massport tiene una amplia visión de la sustentabilidad que se basa en el concepto de resultado triple y toma en cuenta el contexto específico del aeropuerto. Massport está comprometido con la implementación de prácticas sustentables tanto por parte del Aeropuerto como por parte de las autoridades y continúa progresando en diferentes iniciativas. Las siguientes secciones resumen muchas de las iniciativas de sustentabilidad a largo plazo y multifacéticas llevadas adelante por Massport, que se describen de manera más detallada en los capítulos individuales de este *EDR del 2020/2021,* si corresponde.

Roadmap to Net Zero de Massport

En marzo de 2022, Massport publicó su *Roadmap to Net Zero by 2031*, un ambicioso programa para toda la Autoridad con el fin de lograr cero emisiones netas de GHG para 2031 en las instalaciones bajo su control (Alcance 1 y 2). Este objetivo situaría a Massport casi dos décadas por delante del plazo de 2050 que muchas otras organizaciones se han fijado. En 2031 se cumplirá también el 75.º aniversario de la creación de la Autoridad.

Además de reducir con determinación las emisiones de la Autoridad hasta alcanzar el nivel cero, el plan inspira, fomenta y se esfuerza por permitir los esfuerzos y las innovaciones de los locatarios, los socios comerciales y los usuarios de las instalaciones. Protege la conexión que la Autoridad ofrece entre Massachusetts y Nueva Inglaterra con el resto del mundo. Refuerza y profundiza el papel que desempeña como motor económico regional. Además, tiene como objetivo directo reducir el impacto en nuestras comunidades vecinas. Massport está explorando cinco vías principales para llegar al nivel cero:

- Conservación y eficiencia de la energía
- Fuentes de energía limpias y renovables
- Transporte terrestre sostenible
- Asociaciones
- Cultura de la sostenibilidad y la innovación

Se puede obtener más información en https://www.massport.com/massport/about-massport/roadmap-to-net-zero/.

En el otoño del 2022, Massport estableció una Oficina de Gestión de Programas (Program Management Office, PMO) para ayudar a avanzar en la implementación de *Roadmap to Net Zero by 2031*. El *ESPR del 2022* brindará actualizaciones sobre el estado del programa.

Plan de manejo para la sustentabilidad (Sustainability Management Plan, SMP) del Aeropuerto Logan

En el 2013, la FAA le otorgó a Massport un subsidio para preparar un plan de manejo para la sustentabilidad (Sustainability Management Plan, SMP) para el Aeropuerto Logan. El esfuerzo de planificación, que culminó en 2015, abordó la sostenibilidad de forma holística, incluidas consideraciones de vitalidad económica, eficiencia operativa, conservación de los recursos naturales y responsabilidad social. El SMP del Aeropuerto Logan elaboró un marco y estableció un plan de implementación con indicadores clave de rendimiento diseñados para hacer un seguimiento de los avances en todo el aeropuerto hasta el 2020.

Actualmente, Massport está avanzando en una serie de iniciativas para ayudar a alcanzar sus objetivos (consulte la **Tabla 1-1**) en las áreas de (1) energía y emisiones de GHG, (2) conservación del agua, (3) bienestar de la comunidad, de los empleados y de los pasajeros-, (4) materiales, manejo de los desperdicios y reciclado, (5) resiliencia, (6) disminución del ruido, (7) mejora de la calidad del aire, (8) acceso terrestre y conectividad, (9) calidad del agua/desagües pluviales y (10) recursos naturales.

Cada año desde la publicación del SMP del Aeropuerto Logan, Massport ha seguido ampliando la lente de sus objetivos de sostenibilidad y resiliencia para incorporar sus otras instalaciones de aviación y marítimas. Durante el 2020 y 2021, Massport también buscó nuevas vías para ser un mejor vecino de las comunidades circundantes: reducir el ruido y la contaminación atmosférica, mejorar el acceso terrestre al Aeropuerto Logan y ampliar las iniciativas de Diversidad, Equidad e Inclusión (Diversity, Equity & Inclusion,

DE&I) más allá de sus fronteras operativas. Massport informa su progreso para alcanzar cada objetivo, incluidos los cambios en el desempeño relacionado, en los informes de sustentabilidad. Destaca el progreso de Massport hacia la mejora de la sustentabilidad y hacia la mejora de la resiliencia en sus instalaciones. El último *Informe Anual de Sustentabilidad y Resiliencia* publicado se actualizó en el 2019 y también se puede encontrar en: http://www.massport.com/massport/business/capital-improvements/sustainability/sustainability-management/.

En el 2022, se publicará un nuevo informe, en el que se expondrán los resultados de toda la pandemia mundial en los años fiscales 2020 y 2021 y que servirá para cerrar los objetivos de rendimiento del SMP de 2015. Massport espera anunciar la actualización de las métricas de medición y verificación en su búsqueda de las emisiones netas cero.

Tabla 1-1 Objetivos y descripciones de sustentabilidad del Aeropuerto Logan

Categoría de sustentabilidad	**Objetivo**	**Categoría de sustentabilidad**	**Objetivo**
Energía y emisiones de gases de efecto invernadero (GHG) 	Reducir la intensidad de la energía y las emisiones de GHG mientras se aumenta la parte de energía de Massport generada a través de fuentes renovables.	Preservación del agua 	Preservar los recursos de agua regionales mediante la reducción del consumo de agua potable.
Bienestar de la comunidad, de los empleados y de los  pasajeros	Promover comunidades económicamente prósperas, equitativas y sanas, y el bienestar de los pasajeros y de los empleados.	Materiales, manejo de los desperdicios y reciclado 	Reducir la producción de desperdicios, aumentar la tasa de reciclado y utilizar materiales ecológicos.
Resiliencia 	Transformarse en un modelo innovador y nacional para la planificación de resiliencia y para la implementación entre las autoridades portuarias.	Disminución del ruido 	Minimizar el impacto acústico de las operaciones del Aeropuerto Logan y ampliar el programa de aislamiento acústico.
Mejora de la calidad del aire 	Disminuir las emisiones de contaminantes atmosféricos de las fuentes de Massport.	Acceso terrestre y conectividad 	Proporcionar un acceso terrestre al Aeropuerto Logan superior mediante medios de transporte alternativos y medios de transporte masivos (HOV).
Calidad del agua/Desagües  pluviales	Proteger la calidad del agua y minimizar los desechos de contaminantes.	Recursos naturales 	Proteger y restaurar los recursos naturales en las cercanías de Massport.

Instalaciones certificadas por Leadership in Energy and Environmental Design (LEED®) en el Aeropuerto Logan

El sistema de calificación LEED de United States Green Building Counsil (USGBC) es el sistema de certificación de construcciones ecológicas de terceros más reconocido en los Estados Unidos. Massport se esfuerza por alcanzar la certificación LEED para los proyectos de construcción nuevos y de renovación sustancial sobre más de 20 000 metros cuadrados. Para obtener una lista completa de las certificaciones LEED, consulte la **Figura 1-8** y la **Tabla 1-2**.

Figura 1-8 Instalaciones certificadas por LEED en el Aeropuerto Logan

Tabla 1-2 Instalaciones certificadas por Leadership in Energy and Environmental Design (LEED) en el Aeropuerto Logan

Proyectos de Massport

Terminal A, certificación de LEED (2006)

- Primera terminal aeroportuaria en el mundo en recibir la certificación LEED
- Aceras con prioridad para medios de transporte masivos (HOV) y para bicicletas
- Modernización con paneles solares en el techo de la Terminal A
- Filtración de los desagües pluviales
- Techo reflectante
- Características de reducción del consumo de agua
- Iluminación diurna natural junto con tecnologías de iluminación avanzadas para la eficiencia de la energía
- Uso de materiales reciclados y de fuentes regionales
- Medidas para mejorar la calidad del aire en el interior

Green Bus Depot (LEED Silver) 2014

- Paneles solares en el techo
- Características de ahorro de agua y energía
- Reducción de las millas viajadas por vehículos (VMT)
- Nueva flota de transportes compartidos que incluyen autobuses a diésel limpio/autobuses híbridos eléctricos y autobuses a gas natural comprimido (GNC).
- Materiales de construcción sembrados, cosechados, producidos y transportados de manera sustentable

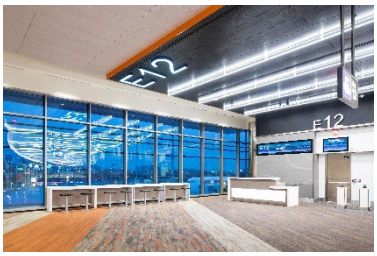
Centro de alquiler de autos (Rental Car Center, RCC) (certificación LEED dorada), 2015

- Materiales de construcción ecológicos
- Paneles solares en el techo
- Accesos y conexiones para bicicletas y peatones
- Iluminación diurna natural y tecnologías de iluminación avanzadas para la eficiencia de la energía
- Uso de materiales reciclados y de fuentes regionales
- Calidad del aire en el interior mejorada
- Estaciones para enchufar vehículos eléctricos y otras fuentes de combustible alternativo como el E-85 (etanol)
- Flotas de autos de alquiler que incluyen vehículos híbridos/de combustible alternativo/de emisiones bajas
- Conexiones para peatones
- Instalaciones para bicicletas y duchas, vestuarios para empleados
- Recuperación del agua para el lavado de autos y uso de desagües pluviales para los usos no potables, como el lavado de vehículos y el riego.
- Reducción de VMT

Tabla 1-2 Instalaciones certificadas por Leadership in Energy and Environmental Design (LEED) en el Aeropuerto Logan (cont.)

Proyectos de Massport (cont.)

Nueva ala para aeronaves grandes en la Terminal E (certificación LEED Gold para interiores comerciales) 2017

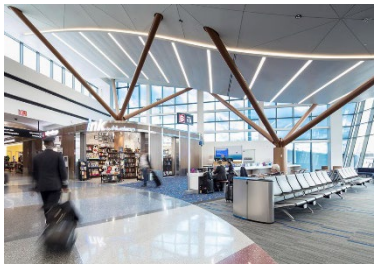


- Reducción del efecto isla de calor al proporcionar un techo blanco reflectante y asfalto de concreto de color claro
- Instalaciones para el agua y para retretes de flujo bajo
- Instalaciones para la luz eficientes, y calefacción, ventilación y sistema de aire acondicionado (heating, ventilation, and air conditioning, HVAC) eficientes
- Uso de fuentes de energía renovables
- Materiales reciclados y de fuentes regionales
- Calidad del aire en el interior mejorada
- Sistema de agua caliente solar térmico para agua de uso doméstico para calentar el 100 por ciento del agua de uso doméstico del ala

Terminal B, puertas 37-38 (LEED Gold para interiores comerciales) 2019

- Equipo certificado Energy Star
- Productos de madera con certificación FSC utilizados en las instalaciones
- Amplias ventanas y vistas al exterior

Optimización de la terminal B (LEED Silver) 2022



- Medidas de conservación de la energía aplicadas para mejorar el rendimiento
- Utilización de materiales reciclados o locales siempre que es posible
- Reutilización de más de la mitad de la estructura o envoltura del edificio anterior
- Importante desviación de residuos de construcción y demolición
- Aplicación de medidas de conservación del agua para reducir el uso de agua potable
- Instalaciones diseñadas para maximizar las vistas exteriores y la iluminación

Proyectos que persiguen activamente la certificación LEED

Conector de la terminal C con la B.

- Iluminación exterior e interior energéticamente eficiente
- Incorporar acristalamientos de alto rendimiento en fachadas acristaladas transparentes
- Instalación de una infraestructura de recarga de vehículos eléctricos para los equipos de apoyo en tierra eléctricos
- Los sistemas de calefacción, ventilación y aire acondicionado (heating, ventilation, and air conditioning, HVAC) eficientes desde el punto de vista energético proporcionan un ahorro anual de energía con respecto a la línea de base
- El efecto de isla de calor se reduce con el material del tejado seleccionado y los materiales de la superficie en el emplazamiento circundante

Tabla 1-2 Instalaciones certificadas por Leadership in Energy and Environmental Design (LEED) en el Aeropuerto Logan (cont.)

Proyectos que persiguen activamente la certificación LEED (cont.)

Modernización de la terminal E

- Acristalamiento dinámico en el sistema de fachada acristalada de la sala de espera para reducir el deslumbramiento y la ganancia solar, lo que permite reducir las cargas globales de refrigeración
- Acristalamiento fotovoltaico Onyx en el alzado sur que proporciona generación de energía eléctrica y ofrece una pantalla solar que también elimina el deslumbramiento y reduce las cargas globales de refrigeración
- Ventilación por desplazamiento en toda la sala de espera del Gran Salón y en el vestíbulo, que proporciona un aumento del 17 % en la eficiencia energética de HVAC
- Todos los nuevos equipos de infraestructuras críticas están elevados por encima del nivel establecido para las tormentas con una probabilidad del 1 % de que ocurran, lo que proporciona sostenibilidad y resistencia

Proyectos para los locatarios

Instalaciones de aviación general que respaldan los vuelos característicos, (certificación de LEED) 2008

- Mecanismos para reducir el uso del agua
- Iluminación diurna natural con tecnologías de iluminación avanzadas para la eficiencia de la energía
- Acristalamiento de las ventanas y sombrillas para maximizar la luz diurna y para minimizar el calentamiento
- Materiales reciclados y de fuentes regionales
- Medidas para mejorar la calidad del aire en el interior

Nouria Service Center (LEED Silver) 2020

- Iluminación y sistemas HVAC eficientes desde el punto de vista energético
- Instalación de aparatos de agua eficientes
- Instalación de paneles solares fotovoltaicos en el tejado
- Instalación de cargadores rápidos de CC para EV

Planificación para el clima y la resiliencia

Ya que el área de Boston continuará experimentando temperaturas elevadas, condiciones climáticas extremas más frecuentes y nivel del mar más elevado debido al cambio climático,[23] Massport entiende la importancia de prepararse para los impactos para proteger y mejorar su infraestructura, sus activos

23 Ciudad de Boston. 2016. *Climate Ready Boston*. https://www.boston.gov/sites/default/files/climatereadyeastbostoncharlestown_finalreport_web.pdf.

operativos y su mano de obra críticos. Mediante la sólida planificación y la colaboración regional, Massport se esfuerza por continuar su función de liderazgo en la planificación de la resiliencia entre las autoridades aeroportuarias, la industria aeroportuaria y la región de Boston.

A finales del 2013, Massport comenzó un *Estudio para la planificación para desastres y resiliencia de la infraestructura (Disaster and Infrastructure Resiliency Planning, DIRP)* para el Aeropuerto Logan, para el puerto de Boston, y para los recursos marítimos de Massport en el sur y Este de Boston. El estudio de DIRP incluye el análisis de los peligros, el modelado del aumento del nivel del mar y marejada ciclónica, y proyecciones de temperatura, precipitaciones y aumentos anticipados de fenómenos meteorológicos extremos. El estudio de DIRP brinda recomendaciones sobre las estrategias a corto plazo para hacer que las instalaciones de Massport sean más resilientes a los posibles efectos del cambio climático. En el 2014, el estudio se completó y se comenzó la implementación de las iniciativas de adaptación a finales del 2014.

Además del estudio de DIRP y de sus iniciativas relacionadas, Massport completó una evaluación de los riesgos con todas las autoridades de sus iniciativas de planificación estratégica, emitió una *Guía de diseño a prueba de inundaciones (Floodproofing Design Guide)* y desarrolló un marco de resiliencia para brindar mediciones congruentes para la planificación a corto y a largo plazo, y para la protección de sus instalaciones e infraestructura críticas. Más allá de la resiliencia de la infraestructura, Massport también se centra en la incorporación de resiliencia social y económica en su planificación operativa y de capital a largo plazo. La *Guía de diseño a prueba de inundaciones* de Massport se publicó en noviembre del 2014 y se actualizó en noviembre del 2018.

Los aspectos operativos de la estrategia de resiliencia incluyen el desarrollo de planes para el manejo de inundaciones para el Aeropuerto Logan y para las instalaciones marítimas de Massport. Estos planes se introdujeron en el 2014 e incluyeron los despliegues previstos para las barreras temporarias contra inundaciones para proteger hasta 12 ubicaciones de infraestructura crítica en caso de condiciones climáticas extremas. Se mejoraron de manera permanente ubicaciones adicionales para prevenir inundaciones. Los planes operativos para inundaciones se evalúan anualmente para mejorar su eficacia y para que se adapten a los requisitos cambiantes y en función de experiencias pasadas. Entre el 2020 y 2021, Massport llevó a cabo un ejercicio de simulación de Aviación y Marítimo en preparación para eventos de tormentas extremas como los huracanes.

Massport informa el progreso hacia los objetivos de resiliencia en sus informes de sostenibilidad anuales. Se encuentra disponible información adicional sobre los programas de resiliencia de Massport en el siguiente enlace:http://www.massport.com/massport/business/capital-improvements/sustainability/climate-change-adaptation-and-resiliency/.

Sociedades de Massport y respaldo a la comunidad

Massport tiene un compromiso que data de hace tiempo de ser un buen vecino. Al trabajar en colaboración con el gobierno, con la comunidad y con los líderes civiles en todo Massachusetts y Nueva Inglaterra, Massport participa activamente realizando esfuerzos para mejorar la calidad de vida de las personas que residen cerca de las instalaciones de Massport.

Massport concedió becas de ciencia, tecnología, ingeniería y matemáticas (science, technology, engineering, and math, STEM) y conmemorativas a seis estudiantes de los barrios de Boston en 2021. Cada año, los estudiantes de secundaria son seleccionados para recibir dos becas Diversity STEM y las becas Thomas J. Butler, Deborah Hadden Gray, Donna Rauseo y Lowell L. Richards III Memorial, en función de sus logros académicos, sus planes de educación postsecundaria y su compromiso demostrado con el servicio a la comunidad. Desde el 2007, Massport ha concedido becas Diversity STEM a 42 estudiantes de color que tienen previsto cursar estudios en un campo STEM. Desde el 2011, Massport ha concedido las becas conmemorativas a 34 estudiantes. Massport también concede becas anuales a los institutos locales para estudiantes de Charlestown, Chelsea, East Boston, South Boston, Revere y Winthrop.

Además, en 2020 y 2021, los empleados de Massport siguieron participando en actividades comunitarias, como la recogida de abrigos de invierno para niños, las cartas de agradecimiento del Día de los Veteranos, la recogida de alimentos en Acción de Gracias y la recogida de mochilas para niños, entre otras.

Por último, como motor de crecimiento económico, Massport se esfuerza continuamente por ampliar las oportunidades económicas y crear equidad para personas y empresas diversas, tanto a nivel interno como en nuestras comunidades circundantes.

Programa de espacio abierto/amortiguación

Massport ha invertido en un amplio programa de espacio abierto para mejorar las comunidades circundantes. Massport destinó inicialmente más de USD 15 millones para la planificación, la construcción y el mantenimiento de cuatro espacios abiertos y dos parques junto al perímetro del Aeropuerto Logan. Estos amortiguadores incluyen el amortiguador Bayswater Embankment Airport Edge, el amortiguador Navy Fuel Pier y el amortiguador del área de servicios sudeste (Southwest Service Area, SWSA) (fases I y II). El premiado Piers Park se completó en 1995 y desde entonces se ha convertido en parte de una red de espacios verdes que atraviesa East Boston desde la zona costera Jeffries Point, a través de Bremen Street Park y Massport Greenway Connector adyacente hasta Constitution Beach.

Junto al Piers Park actual, la fase II de Piers Park adicionará aproximadamente 1,7 hectáreas de espacio verde a la zona costera del Este de Boston cuando se complete. La concesión de permisos para Piers Park II se completó en 2022; la colocación de la primera piedra se realizó en octubre de 2022 y la construcción está prevista para finales de 2023. Los fideicomisarios de las reservas también están estudiando una Fase III de Piers Park, que convertiría un muelle envejecido en un espacio verde de 3,6 acres que incluiría elementos de resiliencia para ayudar a proteger el barrio de las inundaciones y la subida del nivel del mar. Hoy, East Boston disfruta de 5,3 km y de más de 13,3 hectáreas de espacio verde desarrollado o manejado por Massport, en colaboración con la comunidad de East Boston y en respuesta a su participación. Puede obtener más información en el Capítulo 3, *Planificación aeroportuaria*.

Figura 1-9 Parques de propiedad de Massport y operados por este y la ciudad de Boston

Fuente: VHB.

Organización del *EDR del 2020/2021*

El resto de este EDR incluye lo siguiente:

- **Resumen ejecutivo en español,** que proporciona una versión traducida del Resumen ejecutivo incluido después de la versión en inglés del Capítulo 1, *Introducción/Resumen* ejecutivo.
- **Capítulo 2, *Niveles de actividad,*** que presenta estadísticas de la actividad de la aviación para el Aeropuerto Logan en el 2020 y 2021 con una comparación con años anteriores. Las mediciones de las actividades específicas analizadas incluyen pasajeros aéreos, operaciones de aeronaves, mezcla de flota y volúmenes de carga/correo.
- **Capítulo 3, *Planificación aeroportuaria*,** que brinda una descripción general de la planificación, construcción y actividades permitidas que se realizaron en el Aeropuerto Logan en el 2020 y 2021. También, describe la planificación, construcción, y actividades permitidas e iniciativas conocidas futuras.
- **Capítulo 4, *Transporte regional*,** que describe los niveles de actividades en los aeropuertos de Nueva Inglaterra en el 2020 y 2021, y actualiza las actividades de planificación regional recientes.
- **Capítulo 5, *Acceso terrestre desde y hacia el Aeropuerto Logan*,** que informa la cantidad de pasajeros en el transporte público, las calles, los volúmenes de tráfico y el estacionamiento para el 2020 y 2021 con una comparación con años anteriores.
- **Capítulo 6, *Disminución del ruido*,** en el que se actualiza el estado del entorno sonoro en el Aeropuerto Logan en el 2020 y 2021 con una comparación con los años anteriores, y describe las iniciativas de Massport para reducir los niveles de ruido.
- **Capítulo 7, *Calidad del aire/Reducción de las emisiones*,** que brinda una descripción general de la calidad del aire en relación con el Aeropuerto en el 2020 y 2021 con una comparación con los años anteriores, y las iniciativas para reducir las emisiones.

- **Capítulo 8, *Cumplimiento y manejo medioambientales/Calidad del agua*,** que describe las actividades del manejo medioambiental en curso de Massport, incluido el cumplimiento con el NPDES, los desagües pluviales, los derrames de combustible, las actividades del Plan para Contingencias de Massachusetts (MCP) y el manejo de tanques.
- **Capítulo 9, *Medidas que benefician al medioambiente y seguimiento del proyecto de mitigación***, que brinda una descripción general de los programas y de las iniciativas de Massport que proporcionan beneficios medioambientales e informa el progreso de Massport para cumplir la sección 61 de la MEPA[24] sobre los compromisos de mitigación de proyectos específicos del Aeropuerto.

Apéndices de la MEPA: estos incluyen la certificación del secretario para el *EDR del 2018/2019 y* cartas con comentarios recibidas para el *EDR del 2018/2019* y las respuestas a esos comentarios, certificaciones del secretario para los EDR/ESPR emitidos para los años de informe del 2011 al 2017, una lista de revisores a quienes se les distribuyó el EDR y un alcance propuesto para el *ESPR del 2022*. También se incluyen en esta sección las certificaciones del secretario para el Formulario de notificación medioambiental (environmental notification form, ENF) del proyecto de modernización de la Terminal E, evaluación medioambiental (Environmental Assessment, EA)/informe de impacto medioambiental (Environmental Impact Report, EIR) provisorios y EA/EIR finales, y la certificación del secretario para el ENF, DEIR y FEIR del proyecto de estacionamiento del Aeropuerto Logan.

Apéndice A: Certificaciones de la MEPA y respuestas a los comentarios
Apéndice B: Cartas de comentarios y respuestas
Apéndice C: alcance propuesto para el ESPR del 2022
Apéndice D: Lista de distribución

Apéndices técnicos:[25] estos incluyen datos analíticos detallados y documentación metodológica para los diferentes análisis medioambientales presentados y realizados para este EDR.

Apéndice E: Niveles de actividad
Apéndice F: Transporte regional
Apéndice G: Acceso terrestre
Apéndice H: Disminución del ruido
Apéndice I: Calidad del aire/Reducción de emisiones
Apéndice J: Cumplimiento y manejo medioambiental/Calidad del agua
Apéndice K: Informes del control de precios para el período de valores máximos

24 El Capítulo 30, sección 61 (M.G.L. 30, § 61) de las leyes generales de Massachusetts establece que todas las agencias deben revisar, evaluar y determinar los impactos medioambientales de todos los proyectos o actividades, y deben usar todos los medios prácticos y mediciones para minimizar el daño al medioambiente. Para los proyectos que requieren un informe de impacto medioambiental, los hallazgos de la sección 61 especificarán todas las posibles medidas que se pueden tomar para evitar o mitigar los impactos medioambientales, y el cronograma de implementación anticipado para las medidas de mitigación.

25 Los apéndices técnicos están disponibles en el sitio web de Massport en www.massport.com.

2

Activity Levels

During 2020/2021, Boston Logan International Airport (Logan Airport or the Airport) and the aviation industry felt the effects of the worldwide COVID-19 pandemic, which began in mid-March 2020. The pandemic reversed the trend of strong passenger growth driven largely by pre-COVID-19 positive economic conditions in the Boston region, low unemployment, a strong, diverse economic base, and continued investment in commercial and residential real estate, particularly in life sciences, finance, healthcare, and higher education. Starting in March 2020, Logan Airport experienced dramatic reductions in passenger levels and flights. Passenger levels dropped by over 90 percent at Logan Airport in the spring and summer of 2020. Logan Airport and the industry recovery was slow and intermittent during the COVID-19 crisis. As a result, there were fewer aircraft operations and passengers at Logan Airport in 2020 and 2021 when comparing overall activity to the 2019 calendar year. While activity levels began a slow recovery in mid-summer 2020, the ongoing wave of COVID-19 cases resulted in continued historically low levels of passenger and aircraft activity. By year-end 2020, total flight operations were down approximately 50 percent and passenger levels were down by about 70 percent compared to year-end 2019. Aircraft operations increased in 2021, with total flight operations and passenger activity increasing by about 62 percent and 53 percent of 2019 levels, respectively. Although 2020 passenger activity dropped to levels not seen since the 1970s, in 2021 the Airport showed a gradual return towards 2019 levels. For the first 8 months of 2022 (January to August), operations were down approximately 13 percent and passengers were down approximately 18 percent compared to the first 8 months of 2019.[1]

As of the filing of this *2020/2021 Environmental Data Report* (EDR), Logan Airport continued to be one of the nation's most impacted large hub airports experiencing one of the most dramatic reductions in levels of passenger and aircraft operations. While the effects of COVID-19 on the aviation industry and Logan Airport continue to evolve and long-term impacts remain uncertain, this *2020/2021 EDR* provides an update on the significant changes and the developing trends across the airline industry and Logan Airport while providing context on performance recovery relative to 2019 pre-pandemic levels.

Introduction

Logan Airport plays a number of critical roles in the local, New England, and national air transportation systems. It is the primary airport serving the Boston metropolitan area, the principal New England airport for long-haul services, and a major U.S. international gateway airport for transatlantic services. Logan Airport is a key transportation and economic resource in the New England region, the state, and the Boston metropolitan area, which is home to a broad range of industries and with a relatively wealthier population when compared to the U.S. average.

1 Massport. Logan Airport Statistics. https://www.massport.com/logan-airport/about-logan/airport-statistics/

The industries accounting for the largest share of employees include healthcare and social assistance;[2] educational services; and professional, scientific, and technology services (which include Boston's growing biotechnology industry).[3] In 2019, Boston/Cambridge, the nation's largest biopharma cluster, committed to advancing digital health through creation of a digital health record database where the industry is expected to grow and generate more than $350 billion in annual value by 2025.[4] Even during the height of the global pandemic that caused an economic downturn in other business sectors, the Commonwealth's biopharma industry continued to thrive, adding about 85,000 jobs and raising over $5.8 billion in venture capital. A report from the Massachusetts Biotechnology Council (MassBio) highlighted that the state of the industry in Massachusetts, including surging employment, launching of new companies, and adding lab space, increased biopharma employment by 92 percent over the past 15 years, with an average annual wage in the industry near $190,000. Companies such as Moderna, which has seen extraordinary growth over the past year with the authorization of its COVID-19 vaccine, have increased their employee base. Overall, MassBio predicts that an additional 20 million square feet in lab and biomanufacturing space allocated across the state by 2024 will create demand for up to 40,000 new positions.[5]

The City of Boston was also declared the "#1 city in the U.S. for fostering entrepreneurial growth and innovation" in 2017, where continued longtime strengths from top-tier universities and talent have fueled its strong startup ecosystem.[6] The contribution of innovation and business startups was also evident in the 2019 year-to-date economic growth estimates and reflected the trends in increased employment and high-tech industries. Even into 2021, according to *JLL Innovation Geographies* report, Boston was ranked number 4 for innovation, among other top global markets like Silicon Valley (i.e., San Jose) and Tokyo. The Boston region and Massachusetts are leaders in the life sciences industry and home to the largest number of life sciences headquarters in the world, with more than 250 companies that each have over $100 million in funding.[7]

In addition to supporting the economic success of the Commonwealth, Logan Airport and the airport industry have always been important elements in the state and regional economies. The *Massachusetts Statewide Airport Economic Impact Study Update,* completed by MassDOT in 2014 and most recently updated in 2019,[8] estimates that the three Massport airports contribute approximately $23.1 billion in output to the Massachusetts economy annually; of this output, 71 percent is due to Logan Airport alone.[9] Total output includes on-Airport businesses,

2 The Social Assistance subsector of the North American Industry Classification System and includes Individual and Family Services; Community Food and Housing, and Emergency and Other Relief Services; Vocational Rehabilitation Services; and Child Day Care Services. U.S. Bureau of Labor Statistics. 2019. Industries at a Glance – Social Assistance: NAICS 624. https://www.bls.gov/iag/tgs/iag624.htm

3 U.S. Census Bureau via DataUSA. 2019. Boston-Cambridge, Newton, MA-NH Metro Area profile. www.datausa.io

4 Massachusetts Biotechnology Council (MassBio) conference; McKinsey estimate, "The Era of Exponential Improvement in Healthcare." https://www.mckinsey.com/industries/healthcare-systems-and-services/our-insights/the-era-of-exponential-improvement-in-healthcare

5 Biospace. "MassBio Industry Snapshot Predicts 40,000 New Biopharma Jobs Over the Next 10 Years," 25 August, 2021. https://www.biospace.com/article/massbio-industry-snapshot-predicts-40-000-new-biopharma-jobs-over-the-next-10-years/

6 U.S. Chamber of Commerce Foundation and 1776. 2017. *Innovation That Matters*. https://www.1776.vc/reports/innovation-that-matters-2017/

7 Boston Business Journal. "Resilience and recovery: What is driving Boston's economy forward?" 21 March 2022. https://www.bizjournals.com/boston/news/2022/03/21/what-is-driving-boston-s-economy-forward.html

8 MassDOT Aeronautics Division. 2019. *Massachusetts Statewide Airport Economic Impact Study Update*. https://www.mass.gov/files/documents/2019/03/25/AeroEcon_ImpactStudy_January2019.pdf

9 *Ibid*.

construction, visitor, and multiplier effects.[10] Logan Airport supports over 162,000 direct and indirect jobs, while generating approximately $16.3 billion per year in total economic output.[11]

This chapter describes 2020/2021 activity levels and historical trends for:

- Air passengers and aircraft operations at Logan Airport;
- Aircraft fleet mix;
- Cargo and mail volumes at Logan Airport; and
- Airline service at Logan Airport.

Air traffic and passenger activity levels at Logan Airport are the basis for the evaluation of noise, air quality effects, and ground access conditions associated with Logan Airport. In this chapter, current activity levels at the Airport are compared to prior-year levels, and historical passenger and operations trends at Logan Airport dating back to 2000 are reviewed.[12]

This EDR includes updates on 2020 and 2021 activity levels that reflect the impacts of the COVID-19 pandemic and other changes in the aviation and travel industries. As the longer-range impact of the pandemic becomes clearer, Massport expects to be able to present updates on passenger activity and an early understanding of the anticipated recovery. The next Environmental Status and Planning Report (ESPR), which is planned to follow this EDR, will provide an updated activity forecast.

Logan Airport is an important origin and destination (O&D)[13] airport both nationally and internationally. From 2014 to 2019, Logan Airport had been on average growing by 5.4 percent annually and was ranked 20th among large hub sized U.S. airports over the past five years prior to the pandemic.[14]

Although Logan Airport had reached an all-time high in passenger counts prior to the pandemic, reaching

Source: ACI-NA, 2021; U.S. DOT T-100 Database, 2021.
Note: A U.S. international passenger gateway refers to a U.S. port of entry for passengers traveling internationally. Logan Airport ranks 12th among other U.S. airports with international service, in terms of total number of international passengers.

10 Multiplier effects refer to the recirculation of money in the local economy after initially being spent by the Airport, its tenants, or tourists. This recirculation increases the overall impact of the Airport's operation on the local economy.

11 MassDOT Aeronautics Division. 2019. *Massachusetts Statewide Airport Economic Impact Study Update.* https://www.mass.gov/files/documents/2019/03/25/AeroEcon_ImpactStudy_January2019.pdf

12 Refer to Appendix E, *Activity Levels,* for available information dating back to 1980.

13 "Origin and destination" (O&D) traffic refers to the passenger traffic that either originates or ends at a particular airport or market. A strong O&D market like Boston generates significant local passenger demand, with many passengers starting their journey and ending their journey in that market. O&D traffic is distinct from connecting traffic, which refers to the passenger traffic that does not originate or end at the airport but merely connects through the airport en route to another destination.

14 Between 2014 and 2019, Logan Airport was the 20th fastest growing airport in the U.S. in terms of domestic O&D traffic compared to the top 30 large hub U.S. airports (U.S. DOT O&D Survey).

42.5 million passengers in 2019, the impacts of the pandemic significantly reduced the Airport's passenger and flight operation activity levels.

- Passenger levels in 2020 fell to 12.6 million (or a decline of approximately 70 percent compared to 2019), which was less than passenger levels seen in the 1970s.
- By the end of 2021, however, passenger volumes recovered compared to 2020 passenger volumes, reaching 22.7 million passengers, but still well below 2019 levels.
- Aircraft operations dropped to 206,702 in 2020 and increased to 266,034 in 2021, compared well below the 427,176 flights at Logan in 2019. For context, Logan Airport's historical peaks in operational activity were the 487,996 movements previously reported in 2000 and the Airport's historical peak of 507,449 operations achieved in 1998.
- As a percentage of 2019 operation activity levels, 2020 and 2021 recovered to approximately 48 percent and 62 percent of 2019 levels, respectively.

During the early stages of the pandemic, airlines reduced and managed service opportunities to right-size their network and operations given the suppressed demand. In 2021, pent-up demand for air travel both benefited and strained the U.S. airline industry as airlines continued to manage route economics, seat capacity, and operations during this recovery period. On-going issues related to supply chain, labor shortages for pilots, flight crew, maintenance workers, aircraft delivery delays, and fuel costs have posed as challenges for airlines at Logan Airport and across the national system. These trends continue through 2022.

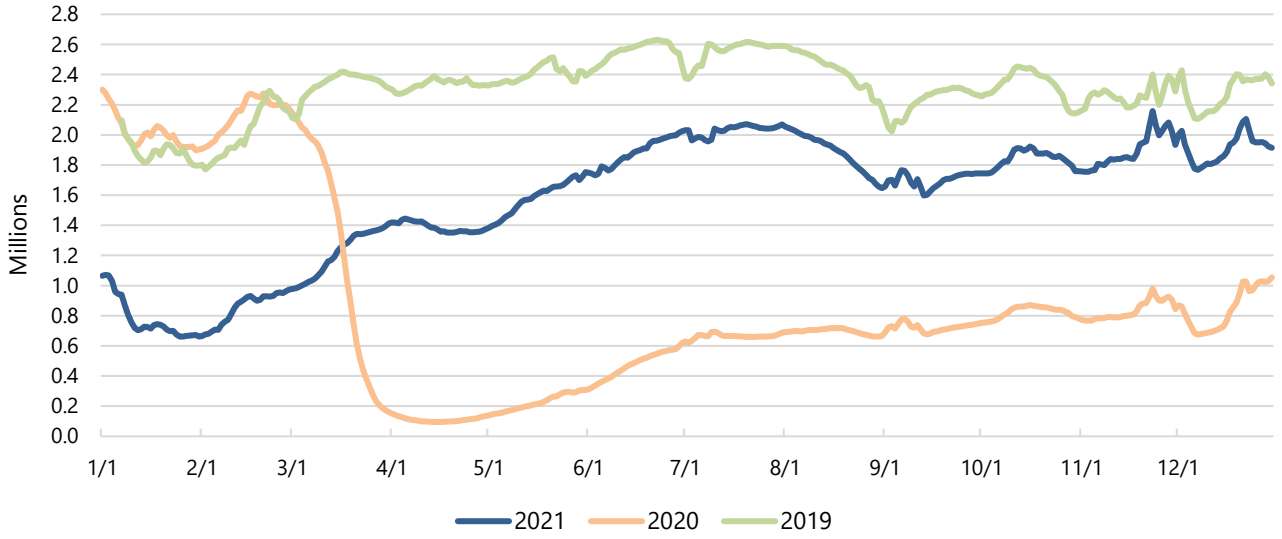
National and Local Aviation Trends

Notwithstanding the COVID-19 pandemic, major changes occurred over the last several years in the U.S. aviation industry that had differing effects on airports depending on their role in the national aviation system. These changes affect air service at large airports such as Logan Airport that are exposed to operational fluctuations by both domestic and international air carriers. Trends that impacted the airline industry, and also Logan Airport, over the past few years include the COVID-19 global pandemic, new industry alliances, growth of low-cost carriers, and changes in aircraft fleets.

COVID-19 Impacts

COVID-19 affected global air travel since demand dropped over 96 percent nationally in March 2020 (98 percent at Logan Airport in April 2020). Recovery since then has been inconsistent as travel restrictions, vaccine availability, and virus variants impacted both airline capacity and passenger travel demand. Nationally, as shown in **Figure 2-1**, 80 percent recovery to 2019 demand levels occurred in July 2021 as travel restrictions loosened and vaccines were made widely available. In December 2021, passenger demand at U.S. airports recovered to approximately 83 percent of 2019 levels. Much of the remaining recovery will be dependent on the return of both business travel and international travel, since domestic capacity across the U.S. has almost fully returned to 2019 levels. Full recovery will also be influenced by airline staffing. Nationwide, airlines have reported challenges with maintaining flight schedules due in part to pilot shortages. To address these challenges, airlines have announced plans to increase hiring and salary structures to replace those staff that retired or left the industry during the pandemic.

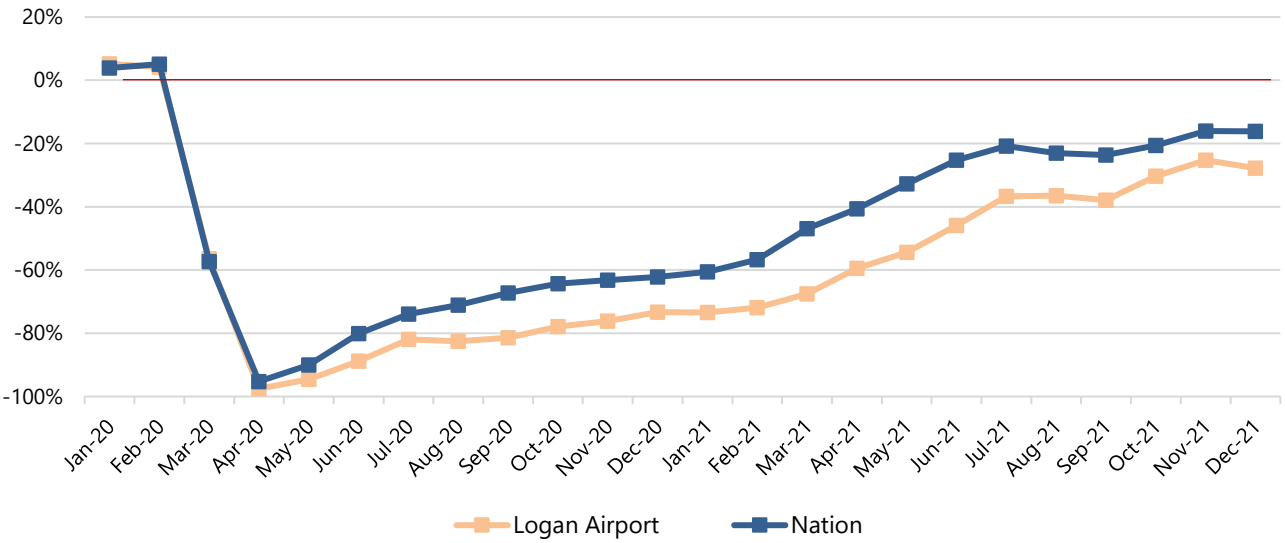
Figure 2-1 Seven Day Average TSA Throughput at U.S. Airports, 2019 through 2021



Source: Transportation Security Administration (TSA) Daily Reports.

As shown in **Figure 2-2**, demand in Boston, while nearing a 70 percent return to 2019 levels in late 2021, has lagged behind national demand by between 10 and 15 percent. This aligns with recovery patterns in other coastal urban markets where business travel and international travel have been slower to return to pre-pandemic levels. Planned international capacity at Logan Airport is expected to return in 2022 and beyond. Filed international seat capacity for the first six months of 2022 at Logan Airport is up 155 percent compared to the same period in 2021, but is still approximately 27 percent below the same period in 2019.

Figure 2-2 January 2020 to December 2021 Monthly TSA Throughput Compared to 2019

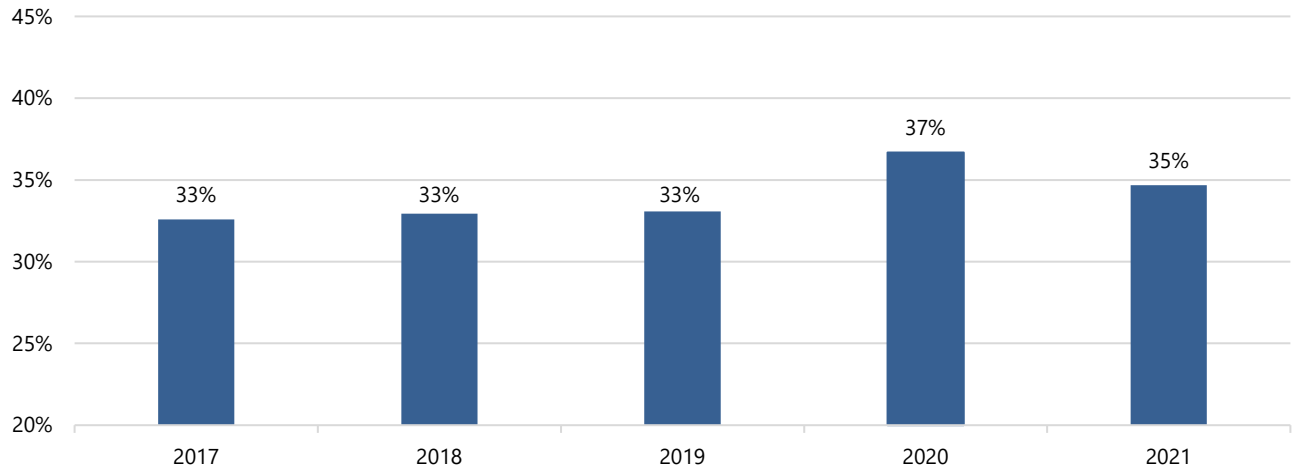


Source: Transportation Security Administration (TSA) Daily Reports.

Low-Cost Carriers and Ultra Low-Cost Carriers

Low-Cost Carriers (LCCs) and Ultra Low-Cost Carriers (ULCCs) continue to gain market share in the domestic market. The formation of carriers like Allegiant Air, Frontier Airlines, jetBlue Airways, Southwest Airlines, and Spirit Airlines, popularized the low-cost business model. Virgin America, which debuted in 2008, also contributed to this growth until its acquisition by the Alaska Air Group in 2018. No new domestic airlines entered the marketplace until 2021, which saw the launch of Avelo Airlines and Breeze Airways, both with a presence in the Northeast. As shown in **Figure 2-3**, LCCs and ULCCs accounted for roughly one-third of domestic seats. The slight uptick in 2020 and 2021 can be attributed to fewer legacy carrier seats due to a decrease in business travel during the pandemic.

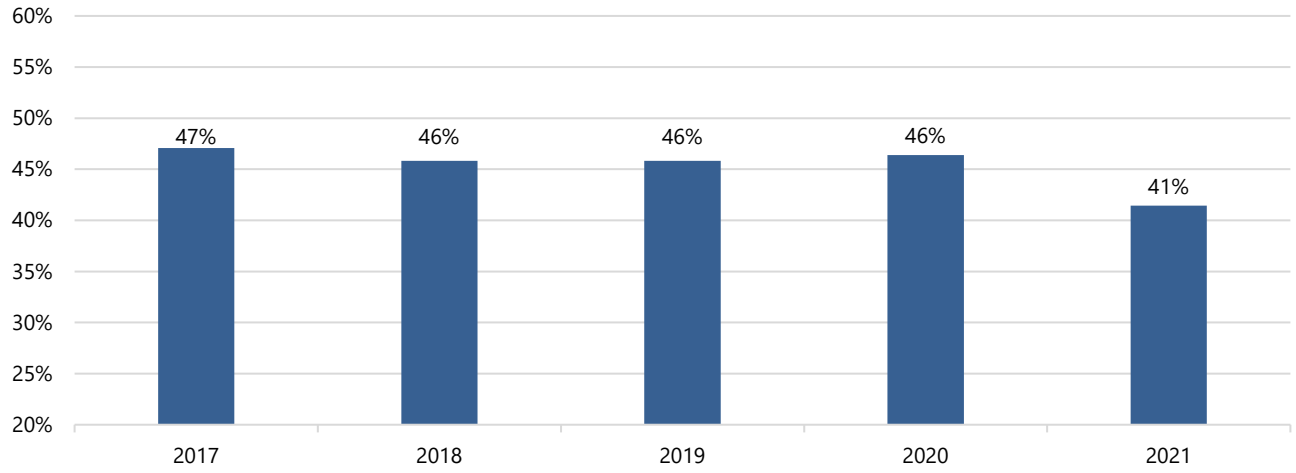
Figure 2-3 Low-Cost and Ultra Low-Cost Carriers Share of Total U.S. Domestic Seats, from 2017-2021



Source: Innovata Schedules, via Diio.

Logan Airport, even during the pandemic years as shown in **Figure 2-4**, has maintained a LCC and ULCC share above the national average, as jetBlue Airways, Southwest Airlines, and Spirit Airlines continued to add service. The slight decline in service in 2021 can be attributed to both a slower recovery of Southwest Airlines as well as a faster recovery of Delta Air Lines.

Figure 2-4 Low-Cost and Ultra Low-Cost Carriers Share of Logan Airport Domestic Seats, from 2017-2021



Source: Innovata Schedules, via Diio.

Aircraft Fleet Evolution

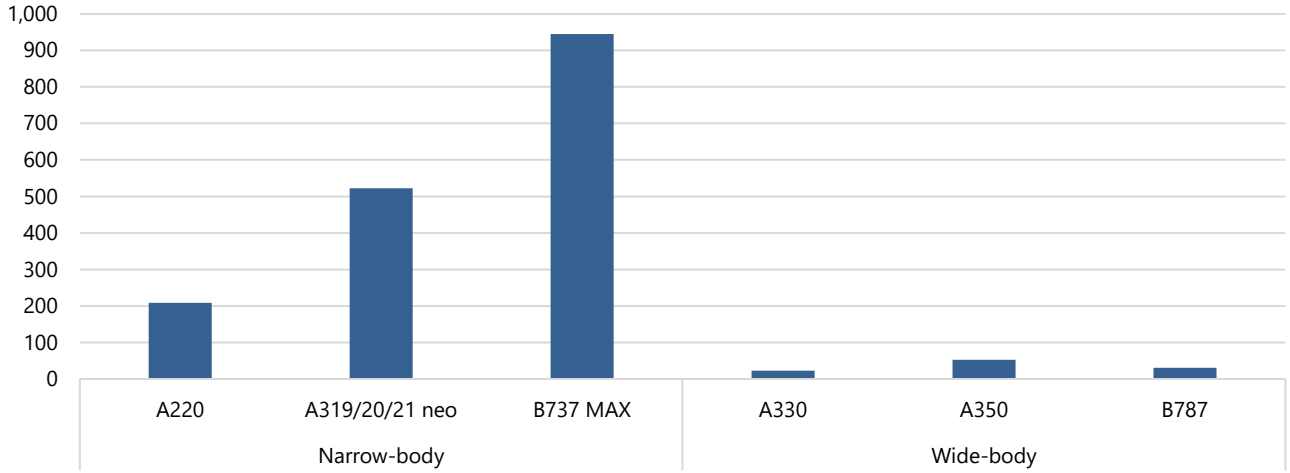
Over 500 aircraft operated by the 15 largest airlines in North America were retired in 2020, as airlines cut costs and became more efficient. These retirements were exacerbated by the grounding of the Boeing 737 MAX aircraft in March 2019. This grounding had the largest impact on the Southwest Airlines fleet but was also felt by American Airlines and United Airlines.

Additionally, the network airlines, consisting of American Airlines, Delta Air Lines, and United Airlines, are expected to reduce the number of small regional jets (RJs) (50 seats or less) to fewer than 200 by 2025.[15] This is a reduction of about 70 percent from 2017 levels. In recent years, smaller RJs have not comprised a significant share of operations at Logan Airport, and this share is expected to remain low in the future given this national fleet shift.

Post-pandemic fleet renewal is already underway. The Federal Aviation Administration (FAA) recertified the Boeing 737 MAX in November 2020, allowing these grounded aircraft to return to service. At the end of 2021, United Airlines had an order book for over 500 aircraft. JetBlue Airways and Southwest Airlines are also taking delivery of new, fuel-efficient aircraft, such as the Airbus A220 and Boeing 737 MAX. JetBlue Airways expects the Airbus A220 fleet to completely replace the smaller, less operating cost efficient, Embraer E190 aircraft by 2026. The A220 provides 40 more seats than the E190, which lowers operating costs per seat and also allows the airline to operate longer routes from Logan Airport and other markets. A summary of unfilled aircraft deliveries to U.S. airlines, including over 1,600 narrow-body aircraft, is provided in **Figure 2-5**.

15 Legacy airline order books and retirement plans from U.S. Securities and Exchange Commission filings.

Figure 2-5 Unfilled Aircraft Deliveries to U.S. Airlines as of March 2022



Source: Boeing and Airbus order sheets for U.S. airlines through March 2022.

The return of the Boeing 737 MAX and the recent introduction of Airbus A321 neo aircraft, have reopened international markets from Logan Airport that were not economically feasible with a wide-body aircraft. These aircraft enable jetBlue Airways to operate flights from Boston to London, TAP Portugal to fly to Lisbon, and Scandinavian Airlines Systems to fly to Copenhagen.

Seats per departure at Logan Airport increased in the years leading up to the pandemic, reaching a high of 129.8 in 2019. With the decline in international flights in 2020 and 2021, the seats per departure declined to 126.1 in 2021. The return of international flights in 2022 and beyond, coupled with delivery of larger narrow-body aircraft, is expected to drive this number higher again.

Forecast Status

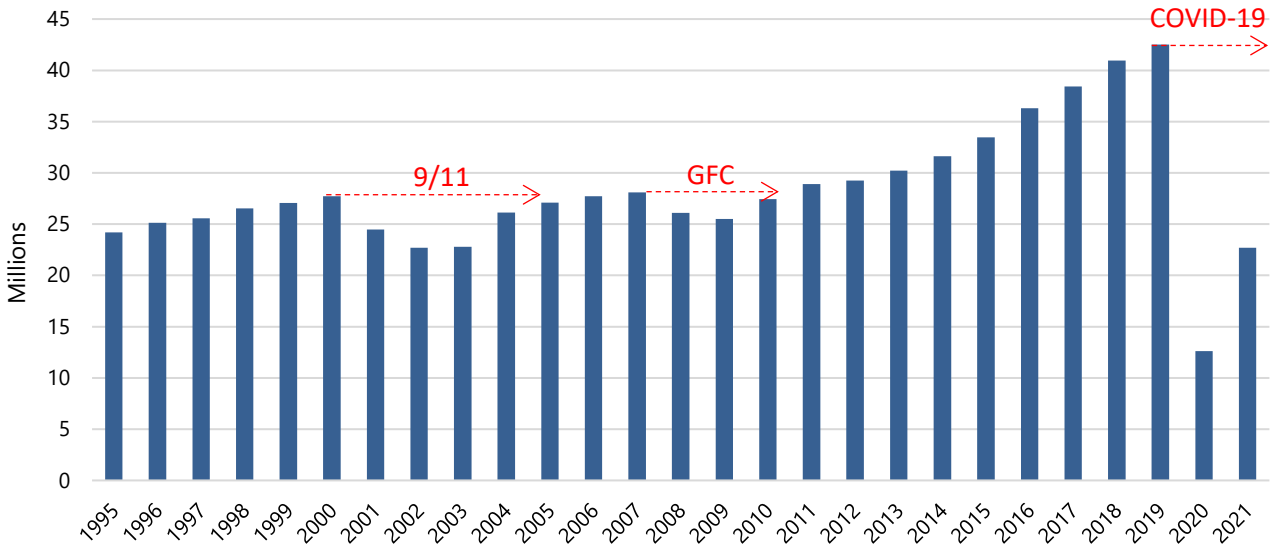
The *2017 ESPR* presented an updated forecast for Logan Airport aircraft operations and passenger activity. That forecast focused on a Future Planning Horizon including a projected 50 million annual air passengers and 486,000 annual aircraft operations. Massport's *2017 ESPR* forecast was consistent with the FAA's Terminal Area Forecast at that time. However, the COVID-19 pandemic dramatically reduced air passenger traffic in 2020 and 2021, with a return to 2019 levels not expected in the near term.

Due to the strong economy in the months prior to the start of the COVID-19 pandemic, passenger activity levels and aircraft operations at Logan Airport increased rapidly. That growth was largely driven by the positive economic conditions in the Boston region, low unemployment, a strong, diverse economic base, and continued investment in commercial and residential real estate, particularly in life sciences, finance, healthcare, and higher education. As with other airports across the U.S., this growth trend was upended in March 2020 at the start of the pandemic.

Prior to the COVID-19 pandemic, there were two exogenous shock events that impacted demand for air travel: the terrorist attacks and aftermath of September 11, 2001, and the Global Financial Crisis (GFC) of 2008-2009. Each of these shock events was followed by gradual recovery cycles, evidenced by a five-year recovery after the

events of September 11, 2001 and a three-year recovery after the GFC, as shown in **Figure 2-6**. Given the resiliency and strength of the Boston regional economy, a return to the growth patterns forecast in the *2017 ESPR* is still forecasted once traffic returns to pre-pandemic levels.

Figure 2-6 Logan Airport Recovery Pattern from External Shock Events



Source: InterVISTAS; Massport traffic statistics.

As of the filing of this *2020/2021 EDR*, Logan Airport continues to recover from reduction in demand from the COVID-19 pandemic. The effects of COVID-19 on the aviation industry and Logan Airport continue to evolve. As a result, the *2022 ESPR* will provide an updated forecast, reflecting recovery from the pandemic as well as industry changes that are reshaping aviation in the U.S.

2022 ESPR Forecast Methodology

The methodology for the *2022 ESPR* aviation demand forecasts will be prepared using standard industry forecasting techniques, which include analyzing:

- Historical patterns of airport traffic and airfares;
- Historical socioeconomic and demographic data;
- Airline strategies and industry trends; and
- Forecasted socioeconomic and demographic data.

This methodology is similar to that used by the FAA to develop the Terminal Area Forecast.

The forecast will be developed using a combination of both a bottom-up (short-term) microeconomic methodology and a top-down macroeconomic methodology. The bottom-up forecast includes a review of recent industry trends and expectations of future airline service and schedule data. It will incorporate airline input regarding short-term capacity recovery from COVID-19 as well as input from industry trade groups such as Airlines For America (A4A), the International Air Transport Association (IATA), and Airports Council International

(ACI). These industry groups provide important context into the recovery at gateway markets such as Boston, compared to domestic and regional markets.

Statistical analyses of the relationship between historical demand and local and national economic conditions will inform the top-down, longer-term forecast. Previously, econometric factors such as U.S. Gross Domestic Project (GDP), regional GDP, regional total personal income, and the cost of fuel served as representative independent variables in the regression analysis. Given Boston's market size and strong economy, these factors may be used again in the *2022 ESPR* aviation demand forecasts.

It is also important to note that given Logan Airport's position in the northeast regional market, the trends and market dynamics at other nearby airports such as Manchester-Boston Regional Airport (MHT) and Rhode Island T.F. Green International Airport (PVD) will also be considered.

Air Passenger Levels in 2020 and 2021

Logan Airport is the principal airport for the greater Boston metropolitan area, and the international and long-haul gateway for much of New England. Logan Airport was ranked the 19th busiest airport in the U.S. in terms of air passengers in 2020, and retained the same rank in 2021.[16] Logan Airport served 12.6 million passengers in 2020, a decrease of 70.3 percent compared to 2019 levels, having lost more than 29.9 million air passengers. In 2021, the Airport continued its recovery path, having added 10.0 million passengers, ending the year with about 22.7 million, recovering to approximately 53.3 percent of 2019 passenger levels. Consistent with the rest of the U.S. airport industry, Logan Airport experienced steep declines in airline activity and passenger volumes over the past two years. Different states and different regions within the U.S. have varied in their response to COVID-19 restrictions which in turn reflected the willingness of consumers to resume travel to and from particular markets. The net result is that air travel recovery at Logan Airport is a work in progress. Logan Airport has been recovering at a slower rate when compared to the overall U.S. scheduled passenger recovery, which recovered 72.7 percent of its 2019 levels in 2021.[17] Prior to the pandemic, Logan Airport had been averaging an annual passenger growth of 5.1 percent since 2014, and was previously outpacing the overall U.S. passenger growth of 4.0 percent per year for the same time period.

As a large hub airport along the U.S. eastern seaboard, Logan Airport was ranked 6th in terms of transatlantic international passengers with nearly 5.0 million passengers flying to Europe, the Middle East, and Africa in 2019. Due to international travel restrictions and limited international services in 2020, transatlantic passenger volumes fell 82.8 percent compared to 2019, where Logan Airport ranked 9th among U.S. gateways. In 2021, traffic across the Atlantic recovered 23.8 percent of 2019 levels or 1.2 million, making the Airport the 8th busiest in the 12-month period ending December 2021. Throughout the first two years of the pandemic, several aviation trends and factors emerged and contributed to the continued strength and resiliency of Logan Airport's regional market, which supported traffic recovery patterns and new growth opportunities. Those trends included:

16 U.S. DOT T-100 database, latest international data available through December 2021.

17 Bureau of Transportation Statistics.

- Continued economic growth and an increase in air travel demand across the nation, especially in Massachusetts and the Boston metropolitan area to leisure-oriented and business growth markets;
- Continued growth by air carriers jetBlue Airways' and Delta Air Lines' at Logan Airport, along with expanded airline partnerships (i.e., jetBlue and American Airlines' Northeast Alliance [NEA]);
- Expansion of airline's international networks where new international destinations are introduced by both domestic and foreign flag carriers; and
- Improved aircraft technology that introduces longer-range aircraft with fuel-efficient engines that generate less noise than their predecessors.

Other traffic growth and economic challenges within the industry that may impede the Airport's recovery pattern include, but are not limited to:

- Any slowdowns in economic activity at the State, regional, national, and/or international level;
- Airline labor constraints, particularly within the labor supply market for pilots, flight crew, and maintenance services workers, along with supply chain disruptions that may delay the delivery of goods and materials;
- The evolution and future of business travel and corporate travel policies; and
- The return of international travel and restrictions in border control, and their respective policies.

As shown in **Table 2-1**, domestic air passengers represent Logan Airport's largest market segment, accounting for approximately 85.0 and 88.4 percent of total air passengers in 2020 and 2021, respectively. The high proportion of domestic activity at Logan Airport is attributed to the strong demand for domestic leisure travel, especially in markets that cater to outdoor recreational activity and warm weather. Growth recovery trends in domestic travel exceeded the international segment's trend, the latter of which exhibited a slower rebound in passenger activity in 2020 and 2021 as countries began to re-open their borders to visitors after COVID-19 vaccines became widely distributed at the end of 2020 and throughout 2021. In 2020, the domestic passenger market declined by 68.5 percent to 10.7 million compared to 2019 but rebounded in 2021 to 20.0 million passengers compared to 2020, which represents about 58.8 percent of 2019 annual domestic passenger levels. Although domestic passenger activity reached a record peak of 34.1 million in 2019, 2021 domestic passenger activity levels are below levels seen prior to 1998.

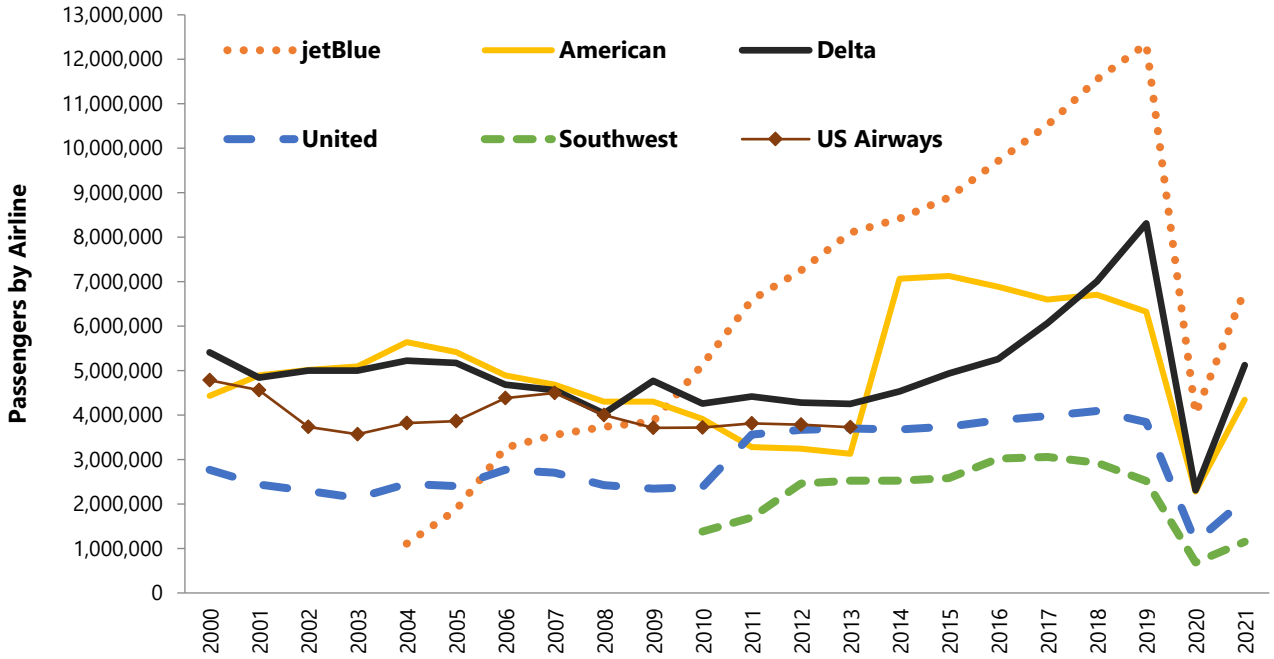
International passenger traffic at Logan Airport declined by 77.9 percent year-over-year in 2020 versus 2019, but increased in 2021 compared to 2020, resulting in a 30.7 percent recovery when compared to 2019 international passenger levels. In 2020 and 2021, international passengers comprised approximately 14.6 and 11.2 percent of total Airport passenger shares, respectively, whereas prior to the pandemic between 2016 to 2019, international passengers made up between 18 and 20 percent. International travel demand was suppressed globally as airlines scaled-back international nonstop opportunities during the onset of the pandemic, governments implemented border closures, and rigorous testing requirements and vaccine-documentation were needed for non-essential travel, shifting demand to domestic markets that are more leisure-oriented.

Figure 2-7 shows the total annual passengers for the six major airlines at Logan Airport. Overall, the substantial LCC growth at the Airport over the past decade, particularly the entry of jetBlue Airways in 2004 and its

subsequent decision to expand and make Logan Airport one of its focus cities, has exceeded recent consolidation and contraction among other carriers serving Logan Airport.[18]

Provided Logan Airport's strong market demand prior to the pandemic, the market remains a strategic location for international expansion for both jetBlue Airways and Delta Air Lines along with their respective alliance partner airlines. In addition, new foreign carriers entered the market in recent years introducing new nonstop services. The O&D strength of the Boston market makes Logan Airport an attractive gateway for international airlines, and expanded partnerships and codeshares will support connecting passenger opportunities for international flights, especially to transatlantic markets. Additional trends in new aircraft technology have also allowed carriers to utilize smaller and more fuel-efficient aircraft on international routes which benefits mid-size O&D markets like Boston, such as the Airbus A321LR and Boeing 737 MAX. Economic feasibility of longer-range widebody aircraft like the A350, B787, and upcoming B777X program will support connectivity and support additional seat capacity on fewer operations.

Figure 2-7 Annual Passengers at Logan Airport Served by Top Airlines, 2000–2021



Source: Massport.

Notes: U.S. Airways totals in this chart include America West Airlines beginning in 2006 (following 2005 merger), Delta Air Lines totals include Northwest Airlines beginning in 2009 (following 2008 merger), United Airlines totals include Continental Airlines beginning in 2011 (following 2010 merger), Southwest Airlines include AirTran Airways beginning 2012 (following 2011 merger), and American Airlines includes U.S. Airways beginning in 2014 (following 2013 merger). Totals for American Airlines, Delta Air Lines, United Airlines, and U.S. Airways include Delta Shuttle, U.S. Airways Shuttle, and contract carriers doing business as Delta Connection, United Express, U.S. Airways Express, American Eagle, or American Connection.

18 Airline industry consolidation includes the merger of Delta Air Lines and Northwest Airlines in October 2008, United Airlines and Continental Airlines in August 2010, Southwest Airlines and AirTran Airways in April 2011, American Airlines and U.S. Airways in December 2013, and Alaska Airlines and Virgin America in December 2016.

Table 2-1 Air Passengers by Market Segment, 1990, 1998, 2000, 2010, and 2015-2021

	1990	1998 [1]	2000	2010	2015	2016	2017	2018
Domestic	**19,519,247**	**22,429,639**	**23,100,645**	**23,688,471**	**27,810,256**	**29,591,053**	**31,100,950**	**33,245,880**
International	**3,358,944**	**3,985,954**	**4,513,192**	**3,681,739**	**5,534,176**	**6,587,473**	**7,199,595**	**7,583,887**
Europe/ Middle East/Africa [2]	N/A	2,467,585	2,948,452	2,672,635	3,473,579	4,096,114	4,360,706	4,511,543
Bermuda/ Caribbean [3]	N/A	702,383	693,620	518,088	946,428	1,032,330	1,100,769	1,103,394
Canada	N/A	790,731	833,669	486,911	688,459	878,191	1,000,634	1,054,008
Asia/Pacific [4]	N/A	25,255	37,451 [3]	0	316,621	415,869	503,386	531,030
Central/ South America	N/A	0	0	4,105	109,089	164,969	234,100	383,912
General Aviation	**N/A**	**111,115**	**112,996**	**58,752**	**105,148**	**109,516**	**111,874**	**112,158**
Total Passengers	**22,878,191**	**26,526,708**	**27,726,833**	**27,428,962**	**33,449,580**	**36,288,042**	**38,412,419**	**40,941,925**

	2019	2020	2021	Percent Change (2019-2020)	Percent Change (2020-2021)	2020 Recovery as Percent of 2019 Levels	2021 Recovery as Percent of 2019 Levels
Domestic	**34,098,788**	**10,729,614**	**20,040,839**	**(68.5%)**	**86.8%**	**31.5%**	**58.8%**
International	**8,317,993**	**1,838,292**	**2,549,976**	**(77.9%)**	**38.7%**	**22.1%**	**30.7%**
Europe/ Middle East/Africa [2]	5,003,881	862,321	1,168,625	(82.8%)	35.5%	17.2%	23.4%
Bermuda/ Caribbean [3]	1,278,045	615,939	1,054,440	(51.8%)	71.2%	48.2%	82.5%
Canada	985,051	150,906	142,088	(84.7%)	(5.8%)	15.3%	14.4%
Asia/Pacific [4]	602,004	96,356	43,938	(84.0%)	(54.4%)	16.0%	7.3%
Central/ South America	449,012	112,770	140,885	(74.9%)	24.9%	25.1%	31.4%
General Aviation	**105,630**	**50,222**	**87,684**	**(52.5%)**	**74.6%**	**47.5%**	**83.0%**
Total Passengers	**42,522,411**	**12,618,128**	**22,678,499**	**(70.3%)**	**79.7%**	**29.7%**	**53.3%**

Source: Massport.

Notes: Numbers in parentheses ( ) indicate negative numbers. Reported International passengers include only international passengers using Logan Airport as an international gateway; a significant number of international O&D passengers also board domestic flights from Logan Airport to connect to other U.S. gateways to international destinations. Average Annual Growth rates calculate compound annual growth (CAGR).

N/A Not available.

1 1998 represents the historical peak in terms of aircraft operations for Logan Airport with 507,449 operations.

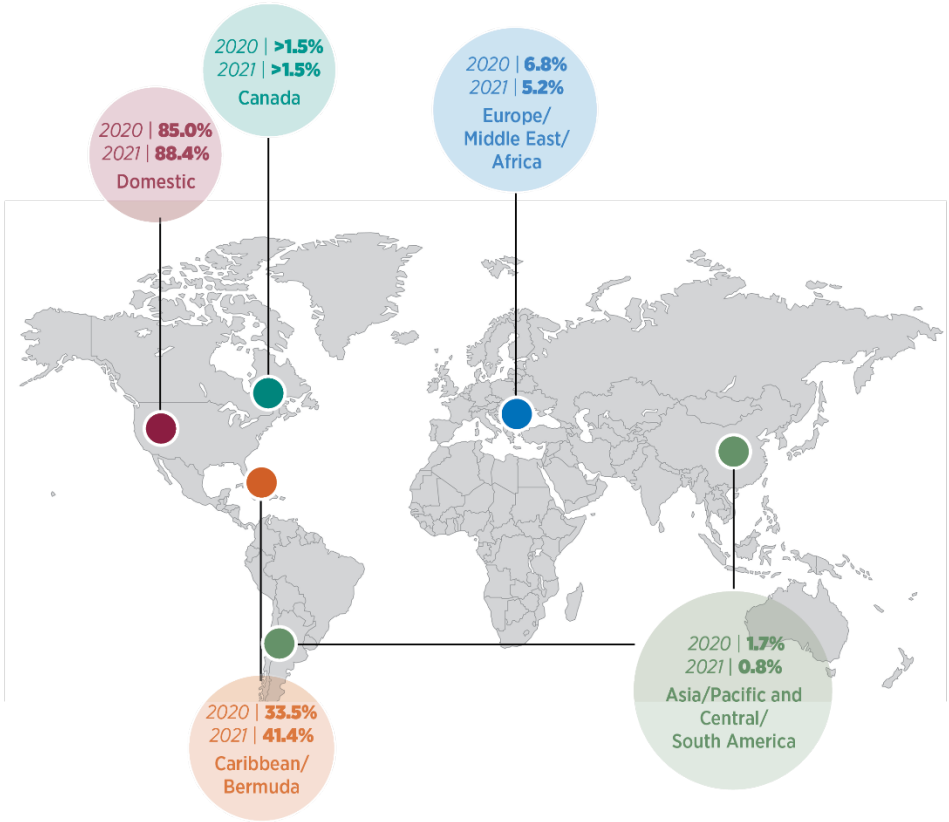
2 Royal Air Maroc commenced service to Casablanca, Morocco (North Africa) in June 2019. However, the carrier is not scheduled to return in 2022 – although as of December 2021, online petitions have been circulating to "bring back" direct flights between Boston and Casablanca (Morocco World News, published December 6, 2021).

3 Includes Puerto Rico and U.S. Virgin Islands.

4 Between 1996 and 2001, Korean Air served Logan Airport with one-stop service via New York John F. Kennedy and Washington Dulles; this service was discontinued in February 2001. However, eighteen years later, starting in May 2019, Korean Air re-commenced service out of Boston with a direct connection to Seoul-Incheon interchanging between their B787 Dreamliner and B777 aircraft.

Figure 2-8 shows the distribution of Logan Airport passengers by market segment. The domestic passenger segment remained the largest segment, having grown from 80.2 percent in 2019 to 85.0 percent in 2020, and adding another 3.4 percentage points in 2021 to represent 88.4 percent of total passengers. As the 27 member states of the European Union agreed to reopen their borders to non-essential traveling visitors who are fully vaccinated against COVID-19 in June 2021 and the U.S. reopened its borders to Europe in November 2021, the transatlantic international segment remained the dominant international destination market in terms of volume. Transatlantic passenger activity accounted for 46.9 percent and 45.8 percent of international traffic and 6.8 percent and 5.2 percent of total passenger traffic at Logan Airport in 2020 and 2021, respectively. The nearby Bermuda/Caribbean region ranked second, more than doubling its 2019 share of international passengers at Logan Airport from 15.4 percent to 33.5 in 2020, then to 41.4 percent in 2021. As of 2021, the Bermuda/Caribbean region recovered the fastest among the international market segments, recovering nearly 82.5 percent of 2019 traffic levels. Passenger traffic share to Canada remained below 1.5 percent of total passengers in both 2020 and 2021 as the U.S.-Canada border remained closed between March 2020 to November 2021, in an effort to contain the COVID-19 virus.

Figure 2-8 Distribution of Logan Airport Passengers by Market Segment, 2020-2021



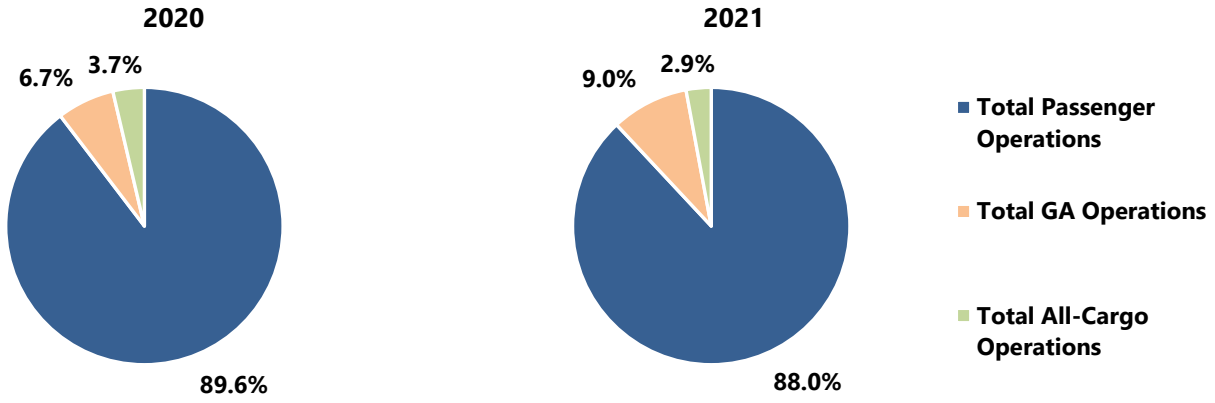
Source: Massport.
Note: General aviation accounted for 0.4% of Logan Airport passengers in 2020 and 2021.

Aircraft Operation Levels in 2020 and 2021

This section reports on aircraft operations levels for Logan Airport, including passenger aircraft operations, General Aviation (GA) operations, all-cargo aircraft operations, and aircraft load factors in 2020 and 2021.

As shown in **Figure 2-9**, passenger aircraft operations in 2020 accounted for 89.6 percent of total aircraft operations at Logan Airport, declining 2.0 percentage points from its 2019 share of 91.6 percent, while GA and all-cargo operations accounted for 6.7 percent and 3.7 percent, respectively. Whereas in 2021, GA and all-cargo operations recovered faster than commercial passenger-related operations, resulting in a share of 9.0 percent and 2.9 percent, respectively, while passenger operations represented the remaining 88.0 percent. The ongoing recovery in passenger operations and aviation demand growth seen throughout mid-2020 through 2021 was primarily attributed to the increased economic activity and fiscal support enacted by Congress contributing to local and State GDP, reduced unemployment rates, improved welfare of New Englanders that use the Airport, and pent-up demand for non-essential air travel.

Figure 2-9 Logan Airport 2020 and 2021 Aircraft Operations by Type



Note: May not add up to 100% due to rounding.
Source: Massport.

Logan Airport Aircraft Operations

The total number of aircraft operations at Logan Airport declined by 51.6 percent, from 427,176 operations in 2019, which was a historic peak since 2001, to 206,702 operations in 2020. Operations then increased in 2021 compared to 2020 to 266,034 operations (**Table 2-2**), representing a recovery of 62.3 percent of 2019 levels. Passenger and GA operations remained below 2019 levels operations in both 2020 and 2021, as airlines adjusted their scheduled networks and in response to the fall in passenger demand due to the COVID-19 pandemic. However, there were existing markets where airlines continued to operate minimum levels of services as a requirement to receive federal Coronavirus Aid, Relief, and Economic Security (CARES) Act financial assistance from the federal government. Several airlines also introduced additional frequencies to existing markets and nonstop services to new markets.

- In 2020, passenger aircraft operations fell 52.7 percent from 2019. RJ operations declined the most by 78.8 percent (or 38,900 fewer flights), specifically from domestic short/medium-haul routes served by

mainline carriers' regional affiliates (e.g., Delta Connection, American Eagle) that were suspended and backfilled by airline's jet aircraft that optimized their hub airport network for connections.

- In 2021, passenger operations increased compared to 2020 to 234,219 operations, which represents a 59.8 percent recovery to 2019 levels.
- Dedicated all-cargo operations, on the other hand, saw significant operational growth at Logan Airport since 2019, increasing by 10.9 and 2.6 percent in 2020 and 2021, respectively. This continued growth resulted in the dedicated all-cargo segment exceeding 2019 levels by 13.8 percent by end of 2021. Multiple passenger carriers, primarily foreign carriers have also conducted COVID-related cargo operations that utilized their passenger jets.
- GA operations continue to recover, having achieved 47.9 percent and 83.1 percent of 2019 levels in 2020 and 2021, respectively. GA operations also continue to shift to smaller, lower-cost facilities outside of Boston, such as Hanscom Field and Worcester Regional Airport.

Figure 2-10 depicts passenger levels and aircraft operations since 1990 and shows a historical trend of increasing passenger levels and operations increasing, though not as rapidly as passenger activity levels. From 2000 to 2019, the annual number of passengers at Logan Airport increased by 53.4 percent, while the annual number of aircraft operations decreased by 12.5 percent, demonstrating the trend of increasing aircraft load factors by air carriers.

Table 2-2 Logan Airport Aircraft Operations (1990, 1998, 2000, 2010, and 2015-2021)

	1990	1998[1]	2000	2010	2015	2016	2017	2018	2019	2020	2021	Percent Change (2019-2020)	Percent Change (2020-2021)	2020 Recovery as Percent of 2019 Levels	2021 Recovery as Percent of 2019 Levels
Total Aircraft Operations	**424,568**	**507,449**	**487,996**	**352,643**	**372,930**	**391,222**	**401,371**	**424,024**	**427,176**	**206,702**	**266,034**	**(51.6%)**	**28.7%**	**48.4%**	**62.3%**
Operations by Type and Aircraft Class															
Passenger Jet	N/A	242,927	254,968	214,307	254,250	270,330	279,464	292,634	296,514	146,071	185,010	(50.7%)	26.7%	49.3%	62.4%
Passenger Regional Jet	N/A	12,087	37,600	66,498	38,229	36,564	39,279	46,926	49,417	10,484	15,778	(78.8%)	50.5%	21.2%	31.9%
Passenger Non-Jet	N/A	209,665	147,913	50,882	46,225	46,868	44,764	46,708	45,492	28,712	33,431	(36.9%)	16.4%	63.1%	73.5%
Total Passenger Operations	**N/A**	**464,679**	**440,481**	**331,687**	**338,705**	**353,762**	**363,507**	**386,268**	**391,424**	**185,268**	**234,219**	**(52.7%)**	**26.4%**	**47.3%**	**59.8%**
GA Jet Operations	N/A	13,636	20,595	11,430	22,418	24,499	24,769	20,092	19,328	10,110	18,123	(47.7%)	79.3%	52.3%	93.8%
GA Non-Jet Operations	N/A	18,076	14,638	3,252	5,748	6,281	6,351	10,848	9,594	3,748	5,919	(60.9%)	57.9%	39.1%	61.7%
Total GA Operations	**24,976**	**31,712**	**35,233**	**14,682**	**28,166**	**30,780**	**31,120**	**30,940**	**28,922**	**13,858**	**24,042**	**(52.1%)**	**73.5%**	**47.9%**	**83.1%**
Cargo Jet	N/A	10,428	11,788	5,332	5,211	5,745	5,800	6,394	6,402	7,208	7,655	12.6%	6.2%	112.6%	119.6%
Cargo Non-Jet	N/A	630	494	942	848	935	944	422	428	368	118	(14.0%)	(67.9%)	86.0%	27.6%
Total All-Cargo Operations	**N/A**	**11,058**	**12,282**	**6,274**	**6,059**	**6,680**	**6,744**	**6,816**	**6,830**	**7,576**	**7,773**	**10.9%**	**2.6%**	**110.9%**	**113.8%**

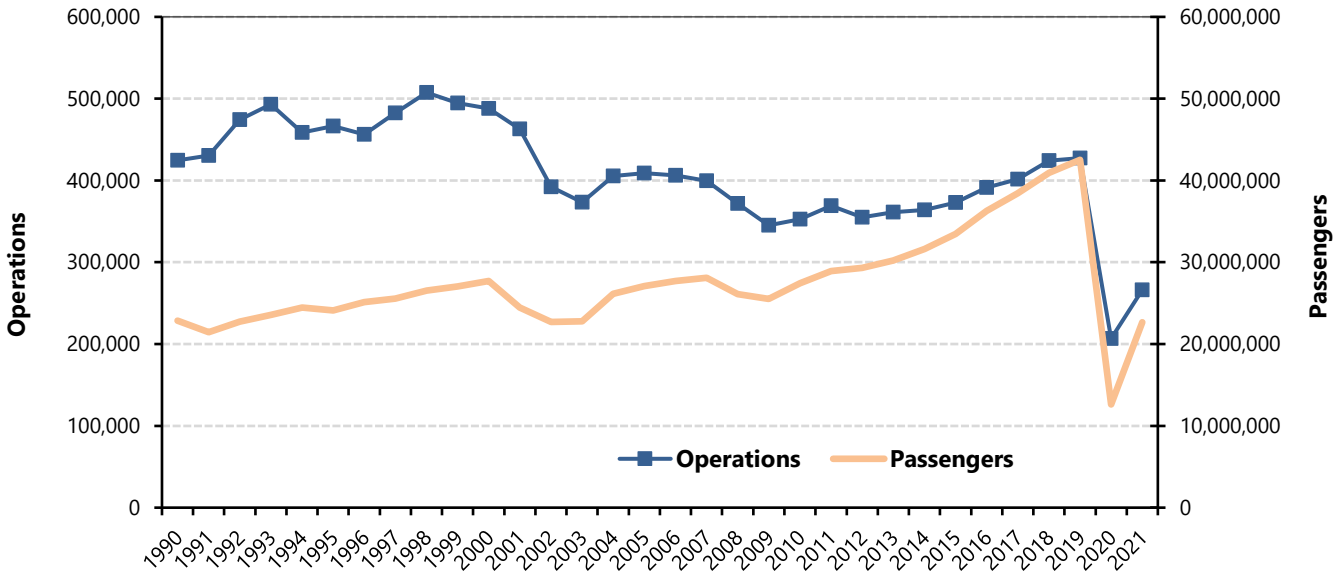
Source: Massport.

Notes: Jet includes the Embraer E-190, which is a regional jet configured with 88 to 100 seats but similar in size to some traditional narrowbody jets.
Numbers in parentheses ( ) indicate negative numbers. Avg. Annual Growth rates calculate compound annual growth (CAGR). All-Cargo Operations increased by two in 2018 compared to the previous *2018/2019 EDR* report, to account for domestic Atlas Air operations that were previously included as passenger operations.

N/A Not Available.

1 1998 represents the historical peak in terms of aircraft operations for Logan Airport.

Figure 2-10 Logan Airport Annual Passenger Levels and Aircraft Operations, 1990-2021



Source: Massport.

Passenger Aircraft Operations

Logan Airport had 185,268 and 234,219 passenger aircraft operations in 2020 and 2021, representing a recovery of 47.3 percent and 59.8 percent in 2020 and 2021, respectively, compared to 2019 passenger operation levels. JetBlue Airways, Delta Air Lines, American Airlines, Cape Air, United Airlines, and Southwest Airlines accounted for nearly 78 percent of total aircraft operations in both 2020 and 2021.[19]

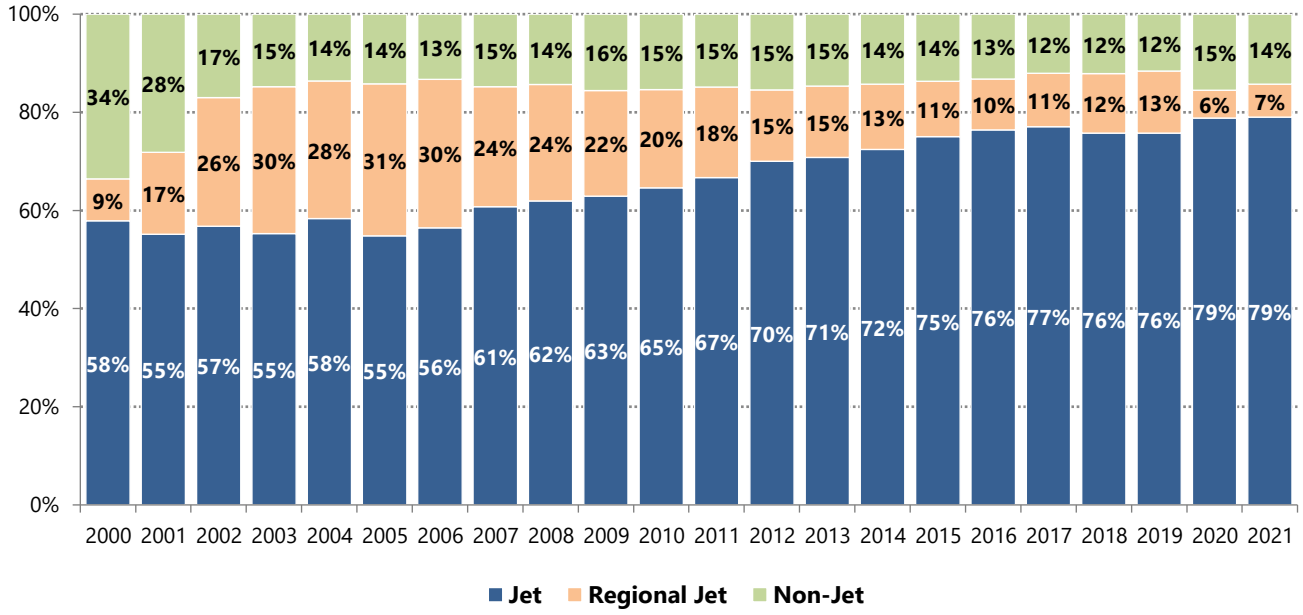
Table 2-2 shows year-over-year changes in passenger RJ, non-jet passenger, and passenger jet operations. As mentioned earlier in this section, RJ operations, which are jet aircraft with fewer than 90 seats, declined the most in 2020 by 78.8 percent to 10,484 operations. RJ operations recovered the slowest among the passenger segments, returning to 31.9 percent of 2019 levels;[20] whereas passenger jet operations and non-jet operations recovered to 62.4 percent and 73.5 percent in 2021, respectively. Between 2006 and 2016, RJ operations had been declining steadily as airlines eliminated unprofitable services to small- and medium-size markets and consolidated services after a period of airline mergers. By 2019, passenger RJ operations increased by 35.2 percent over 2016 levels due to low fuel prices, resulting in mainline carriers' regional affiliates increasing RJ utilization on select routes. However, as a result of the COVID-19 pandemic starting in 2020, RJ activity at Logan Airport fell greater than jet operations as airlines cut routes to smaller airport markets that were not viable and instead added new service to cities that were growth opportunities, thus redeploying jet aircraft.

19 Aircraft operation numbers for airlines include regional partners and subsidiaries.

20 In this report, the term regional jet refers to small jet aircraft with fewer than 90 seats. The Embraer-190, operated by jetBlue Airways at Logan Airport, carries up to 100 passengers and is considered a jet.

The change in the mix of passenger aircraft operations since 2000 is shown in **Figure 2-11**. RJs accounted for 5.7 percent and 6.7 percent of total passenger operations in 2020 and 2021, respectively, compared to 31 percent at the peak level in 2005. Jet aircraft have remained above 70 percent of passenger aircraft operations at Logan Airport since 2012 and increased to a 79 percent share in both 2020 and 2021.

Figure 2-11 Passenger Aircraft Operations at Logan Airport by Aircraft Type, 2000-2021



Source: Massport.
Notes: Jet includes the Embraer E-190, which is a regional jet configured with 88 to 100 seats but is similar in size to some traditional narrow body jets.

Passengers per Aircraft and Load Factors

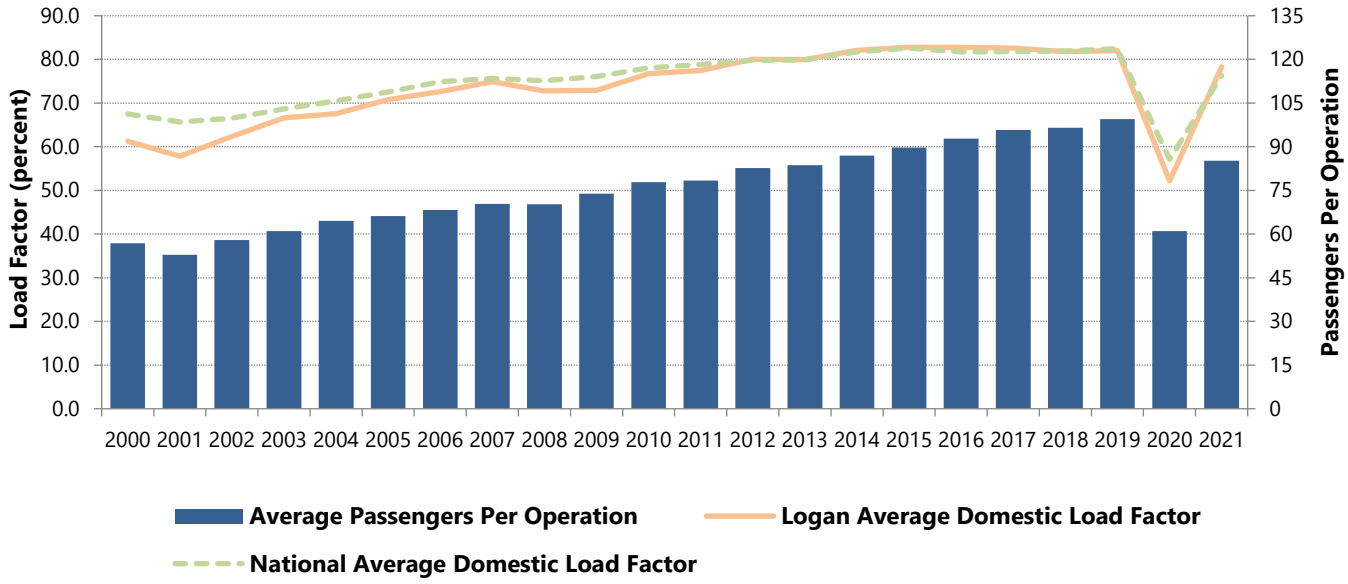
After a long-term trend of greater efficiency through 2019, where the average number of passengers per aircraft operation reached a two-decade peak of 99.5 passengers, average number of passengers per flight fell in 2020 to 61.0 passengers. This represented a 38.5 percent decrease compared to 2019 as a result of the impacts from the global pandemic. International services, which are typically operated by larger widebody aircraft with over 200 seats, were suspended, lowering the average available seat capacity, along with wider use of smaller RJ aircraft on domestic segments. The increase in average passengers per operation prior to the pandemic was attributed by the introduction of newer and larger aircraft like the Airbus 350 and Boeing 787 at Logan Airport, in addition to flights operated by Boeing 777 and Airbus A380 superjumbo jets, especially for international long-haul flights to both existing and new destinations.

However, as the domestic demand recovered and international services began to be restored in 2021, the average passengers per operation increased to 85.2 by the end of 2021, or 85.6 percent of 2019 levels. Overall, an increase in the average number of passengers per aircraft operation indicates an increase in the average aircraft seating capacity and/or an increase in the percentage of aircraft seats occupied by passengers (i.e., load

factor[21]). Changes in the number of passengers per operation and load factors at Logan Airport are shown in **Figure 2-12**. The average number of passengers accommodated per flight at Logan Airport is shown in **Table 2-3**.

As airlines grappled with the pandemic and adjusted their network schedules to optimize route profitability and reduce operating costs, they continued the trend that aimed to support more passengers on fewer flights to generate greater efficiencies in operating performance. This included a temporary shift away from larger aircraft, avoiding flights with empty seats, and operating aircraft with relatively higher operating costs. As demand continues its recovery, airlines plan to utilize larger fuel-efficient aircraft and carefully monitor load factors and appropriately manage seat capacity growth in particular markets. In 2020, Logan Airport's average domestic load factor was 52.2 percent, down 29.8 percent points from 2019 levels of 82.0 percent. In 2021, average domestic load factors increased to 78.3 percent, similar to load factors previously seen in 2011. In comparison, the national average domestic load factor had fallen to 57.1 percent in 2020, and rose to 76.3 percent in 2021.[22]

Figure 2-12 Passengers per Aircraft Operation and Aircraft Load Factors, 2000-2021



Source: Massport; U.S. Department of Transportation (DOT), T-100 Database.
Notes: Includes scheduled passenger service only.

21 The number of onboard passengers as a percentage of total available seats operated at the airport.
22 U.S. DOT T-100 Database; includes scheduled passenger service only.

Table 2-3 Air Passengers and Aircraft Operations, 2000, 2010, 2013-2021

Year	Air Passengers	Percent Change from Previous Year	Aircraft Operations	Percent Change from Previous Year	Average Number of Passengers per Operation	Net Change from Previous Year (Number of Passengers / Operation)	Logan Airport Average Domestic Load Factor	Net Change from Previous Year (Percent Points)
2000	27,726,833	2.5%	487,996	(1.4%)	56.8	2.1	61.3%	0.4
2010	27,428,962	7.5%	352,643	2.1%	77.8	3.9	76.8%	3.8
2013	30,218,631	3.0%	361,339	1.8%	83.6	1.0	79.9%	(0.1)
2014	31,634,445	4.7%	363,797	0.7%	87.0	3.3	82.1%	2.2
2015	33,449,580	5.7%	372,930	2.5%	89.7	2.7	82.8%	0.7
2016	36,288,042	8.5%	391,222	4.9%	92.8	3.1	82.8%	0.0
2017	38,412,419	5.9%	401,371	2.6%	95.7	2.9	82.6%	(0.2)
2018	40,941,925	6.6%	424,024	5.6%	96.6	0.9	81.8%	(0.8)
2019	42,522,411	3.9%	427,176	0.7%	99.5	3.0	82.0%	0.3
2020	12,618,128	-70.3%	206,702	(51.6%)	61.0	-38.5	52.2%	(29.8)
2021	22,678,499	79.7%	266,034	28.7%	85.2	24.2	78.3%	26.1

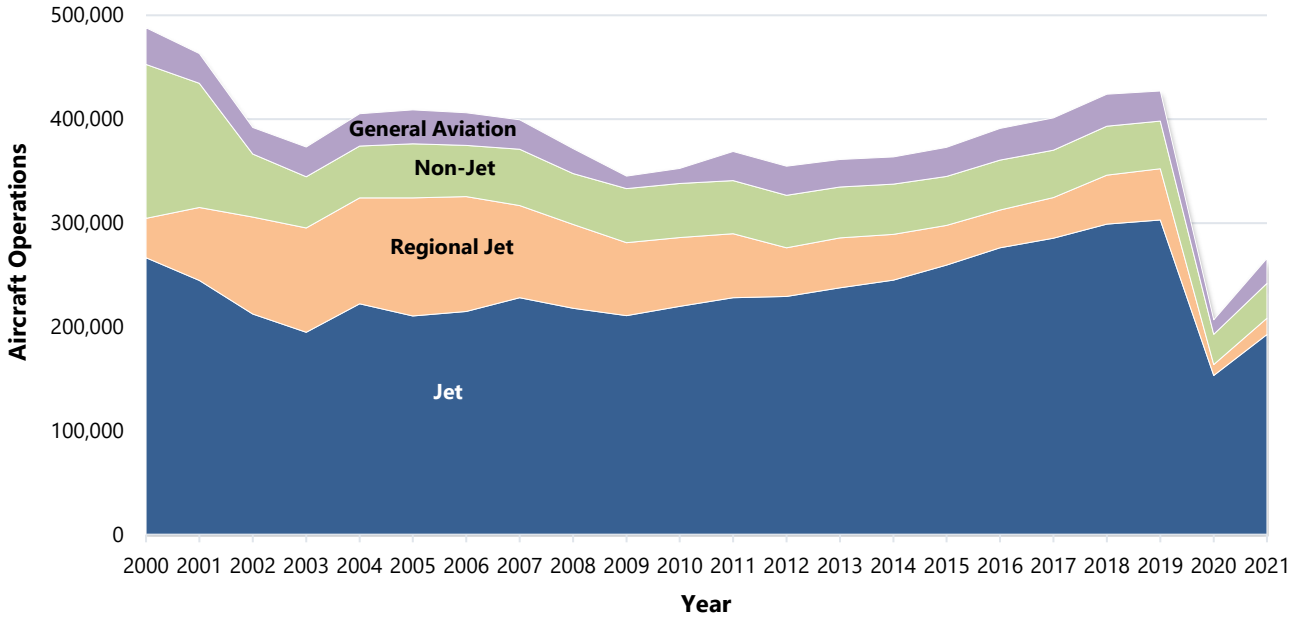
Source: Massport; U.S. DOT, T-100 Database.
Notes: Numbers in parentheses ( ) indicate negative numbers.
Includes scheduled passenger service only.
Refer to Appendix E, *Activity Levels,* for additional passenger and operations data dating back to 1980.

General Aviation Operations

GA is defined as all aviation activity other than commercial airline and military operations. It encompasses a variety of aviation activities at Logan Airport, including corporate/business aviation, private business jet charters, law-enforcement, and emergency medical/air ambulance services. GA operations are conducted by a diverse group of private and business aviation aircraft ranging from single-engine piston driven aircraft to high-performance, long-range jets. GA activity at Logan Airport declined following the 2008/2009 economic recession, but recovered in 2011. Lower oil prices and decreased fuel expenses over the past two years have contributed to an increase in GA activity at Logan Airport. GA operation levels between 2019 and 2021 remained well below the 35,233 GA operations that Logan Airport handled in 2000. In 2020 and 2021, GA operations at Logan Airport totaled 13,858 and 24,042, respectively, which represent a recovery of 47.9 percent and 83.1 percent of 2019 levels.

Table 2-2 shows year-over-year changes in GA operations. Hanscom Field remains the primary GA airport for the Greater Boston region, accommodating over four times the number of GA operations than Logan Airport. Hanscom Field accommodated 98,925 and 122,944 GA operations in 2020 and 2021, respectively, representing greater than 98 percent of Hanscom Field's aircraft activity. **Figure 2-13** depicts changes in the number of Logan Airport aircraft operations by category since 2000.

Figure 2-13 Aircraft Operations at Logan Airport by Aircraft Class, 2000-2021



Source: Massport.
Notes: Jet, regional jet, and non-jet operations are associated with commercial passenger and all-cargo airlines.
GA operations also include jet and non-jet aircraft but are associated with private charter and corporate use.

All-Cargo Operations

Operations by cargo-dedicated aircraft represent less than 3 percent of aircraft activity at Logan Airport in 2019 and 2021, however increased to 3.7 percent in 2020 due to the lack of commercial passenger activity. **Table 2-2** shows year-over-year changes in all-cargo operations. All-cargo carriers at Logan Airport include FedEx, UPS, DHL, and a few other smaller carriers.

Airline Passenger Service in 2020 and 2021

Airlines can adjust service at an airport or on a specific route in two ways: changing the number of flights operated or changing the size of the aircraft. Changes in flight frequency and changes in aircraft size both affect the number of seats available to passengers (seat capacity). Airline services are therefore typically discussed in terms of seat capacity as well as the number of flight departures.[23] This section examines changes in airline departures and seat capacity at Logan Airport in 2020 and 2021 and provides an overview of new, suspended, and discontinued routes that adjusted due to the effects of the COVID-19 pandemic on passenger demand and

23 A departure is an aircraft take-off at an airport. While aircraft operations include both departures and arrivals, airline services are typically described in terms of departures, as the number of scheduled departures generally equals the number of scheduled arrivals. Changes in departures translate to changes in overall operations.

airline decisions to prioritize the economic feasibility of particular routes. Schedule analyses in this section are compared to levels seen previously in 2019, as context.

Service Developments at Logan Airport

In 2020, 45 airlines provided scheduled passenger service from Logan Airport to 135 non-stop global destinations, whereas in 2021, 36 airlines offered scheduled passenger service to 125 global destinations.[24] The average non-stop stage length (the average length of non-stop flights) of scheduled domestic flights from Logan Airport increased from 1,093 miles in 2019 to 1,114 miles in 2020 and to 1,180 miles in 2021. The average non-stop stage length of scheduled international flights declined in 2020 and 2021 compared to 2019, from 3,199 miles to about 3,130 miles as airlines have resumed greater activity to closer international destinations, such as the Central American and the Caribbean region (less than 2,500 miles from Logan Airport), as compared to longer-haul routes to destinations across both the Atlantic and Pacific Oceans. The major changes in Logan Airport's scheduled passenger services in 2020 and 2021 are described below.

Changes in Domestic Passenger Service

The total number of scheduled domestic flights at Logan Airport in 2021 recovered to 62.8 percent of 2019 levels, or 211,549 operations, after falling 50.6 percent the previous year to 166,410. Overall, scheduled jet operations by legacy carriers and LCCs increased by 27.6 percent and 13.9 percent, respectively, in 2021 compared to the prior year, while regional/commuter flights also increased by 44.0 percent. In 2020, scheduled jet carrier operations in aggregate declined 53.7 percent in 2020 versus 2019 levels, and regional/commuter segment fell 40.7 percent. **Table 2-4** shows year-over-year changes in domestic air passenger operations. In terms of scheduled domestic activity recovery in 2021, as a percentage of 2019 levels:

- **Legacy Carrier Service achieved 60.1 percent of 2019 levels in 2021.** Although legacy carrier jet operations declined 52.9 percent in 2020 compared to 2019, operations increased in 2021 compared to 2020, which represented a recovery of 60.1 percent of 2019 levels. Among the top five legacy carriers, Delta Air Lines (excluding its regional carrier affiliate activity) recovered the fastest, ending 2021 with about 73 percent of its 2019 levels, followed by American Airlines, which recovered 56 percent of its 2019 operations. In 2021, Delta Air Lines commenced new operations to Dallas/Ft. Worth and Chicago O'Hare on mainline aircraft, while American Airlines launched nonstop services to Ft. Lauderdale, Austin, and St. Louis.
- **LCC and ULCC Services recovered to 51.9 percent in 2021.** LCC and ULCC accounted for 37 and 33 percent of Logan Airport's total scheduled domestic operations in both 2020 and 2021, respectively.[25]
    - In September 2020, Logan Airport welcomed its sixth LCC/ULCC, Allegiant Air, having commenced point-to-point service to four leisure-oriented destinations.
    - In 2021, Allegiant Air expanded its route network from Logan Airport to seven destinations, all of which are less than 1,300 miles away.

24 Based on OAG Analyzer schedules.

25 Southwest Airlines decreased domestic operations by 14.2 percent from 23,191 operations in 2018 to 19,907 operations in 2019.

  - The largest carrier, jetBlue Airways, had recovered nearly 52 percent of its 2019 operations in 2021, and offered new direct services to Miami, Key West, and San Antonio in 2021.
  - By year-end 2021, several major jetBlue Airways' markets in the Northeast and Upper Midwest regions that had more than once daily departures in 2019, remained greater than 65 percent of 2019 operations levels, which included Philadelphia, Pittsburgh, Chicago (O'Hare), Detroit, Buffalo, Minneapolis, and Syracuse.
  - Frontier Airlines, Spirit Airlines, and Southwest Airlines have recovered nearly 83, 52, and 45 percent of their 2019 operations in 2021, whereas Sun Country had exceeded its pre-pandemic levels by about 24 percent, although it had the smallest network among the LCC/ULCC group.
- **Regional/Commuter Service recovered the fastest to 85.3 percent.** Regional commuter flights had recovered relatively faster than the legacy and LCC groups in both 2020 and 2021. Republic Airlines, which associates itself as a regional affiliate for American Airlines, Delta Air Lines, and United Airlines, drove the significant recovery rate in 2021, having exceeded the number of 2019 flights by over 37 percent. Republic Airlines represented 35 percent of domestic regional/commuter operations in 2020, and 44 percent in 2021. Cape Air (Hyannis Air Service), which is the largest regional operator at Logan Airport, accounted for 53 percent and 46 percent of domestic regional/commuter flights in 2020 and 2021, respectively. The carrier continued to operate to all destinations flown pre-pandemic, with the exception of Albany service. Within Cape Air's network from Logan Airport, six destinations served in 2020 and 2021 are eligible Essential Air Service (EAS) communities[26] in New England/New York.

A complete listing of all changes in scheduled departures by domestic destination is in Appendix E, *Activity Levels*. Logan Airport's scheduled domestic large jet and domestic regional services are illustrated in **Figures 2-14** and **2-15**.

26 The EAS program was put into place to guarantee those small communities that were served by certificated air carriers before airline deregulation maintain a minimal level of scheduled air service. The U.S. DOT is mandated to provide eligible EAS communities with access to the National Air Transportation System. This is generally accomplished by subsidizing two daily roundtrips with 30- to 50-seat aircraft, or additional frequencies with aircraft with 9-seat or fewer, usually to a large- or medium-hub airport.

Table 2-4 Scheduled Domestic Air Passenger Operations by Airline Category, 2000, 2010, 2015-2021

Category	2000	2010	2015	2016	2017	2018	2019	2020	2021	Percent Change (2019-2020)	Percent Change (2020-2021)	2020 Recovery as Percent of 2019 Levels	2021 Recovery as Percent of 2019 Levels
Scheduled Jet Carriers	233,993	203,081	225,629	235,381	242,404	257,795	257,202	119,153	143,520	(53.7%)	20.5%	46.3%	55.8%
Legacy Carriers [1]	222,564	117,877	114,987	114,012	110,790	123,366	121,387	57,211	72,990	(52.9%)	27.6%	47.1%	60.1%
Low-Cost Carriers [2]	11,429	85,204	110,642	121,369	131,614	134,429	135,815	61,942	70,530	(54.4%)	13.9%	45.6%	51.9%
Regional / Commuter	160,041	94,535	70,274	68,204	68,753	74,766	79,736	47,257	68,029	(40.7%)	44.0%	59.3%	85.3%
Total Scheduled Domestic	**394,034**	**297,616**	**295,903**	**303,585**	**311,157**	**332,561**	**336,938**	**166,410**	**211,549**	**(50.6%)**	**27.1%**	**49.4%**	**62.8%**

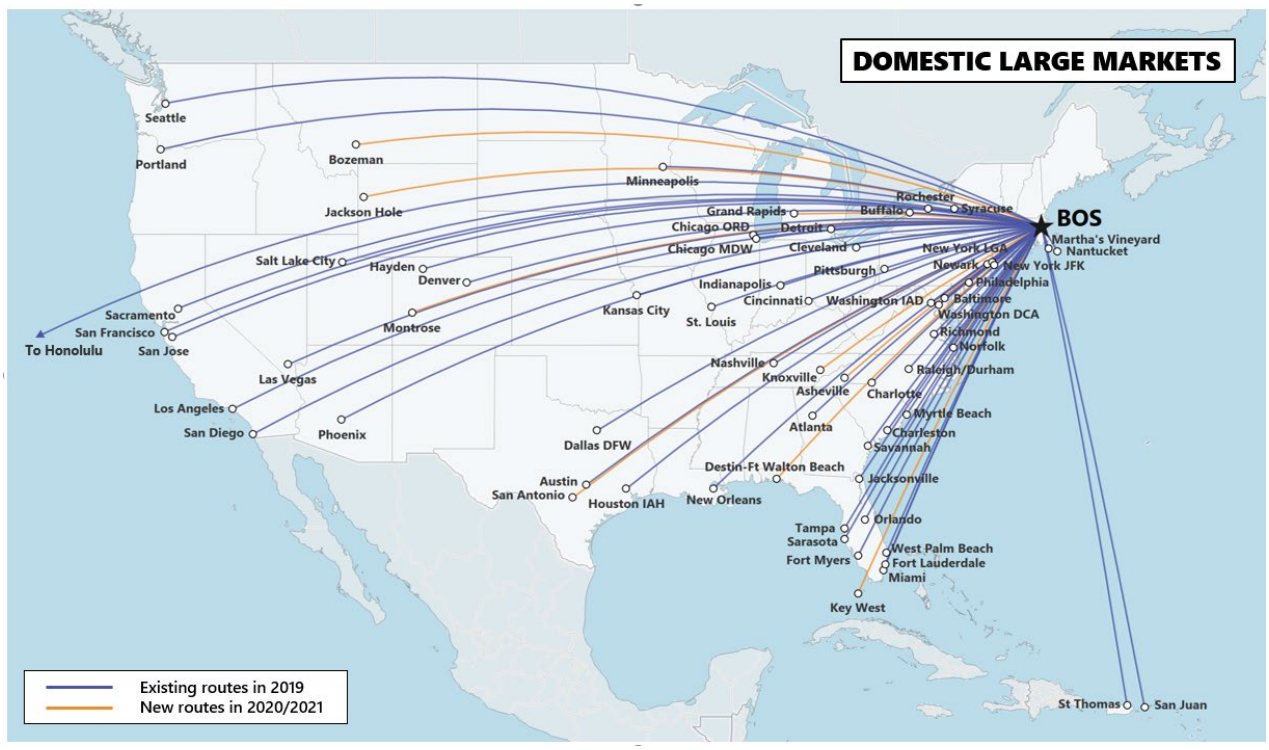
Source: Massport.

Notes: Numbers in parentheses ( ) indicate negative numbers. 2018 and 2019 low-cost carrier volumes have changed from the previous EDR report, as MN Airlines LLC operations (doing business as Sun Country) is included.

1 Includes legacy carrier large jet operations only; regional jet and non-jet operations operated by regional affiliates or subsidiaries of legacy carriers are included in the "Regional/Commuter" category.

2 Low-cost carriers that provided domestic service at Logan Airport in 2020 and 2021 included jetBlue Airways, Southwest Airlines, Spirit Airlines, Sun Country Airlines, Frontier Airlines, and Allegiant Air. Prior to 2019, Virgin America was aggregated with the low-cost subtotals.

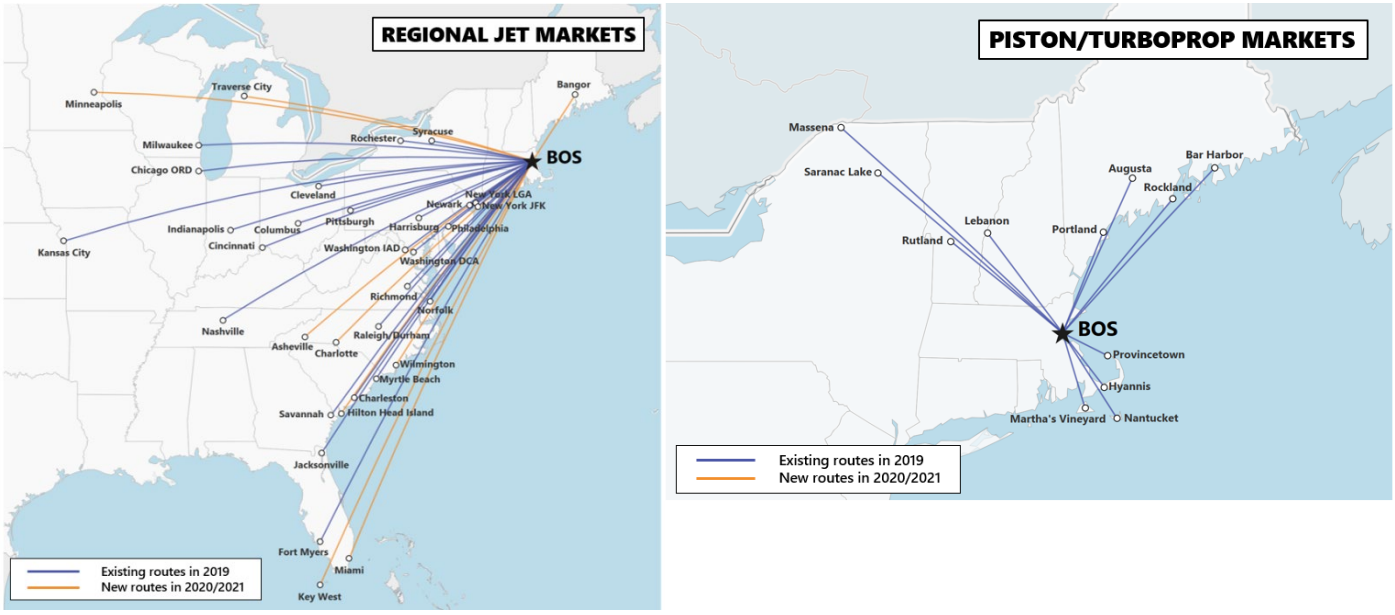
Figure 2-14 Domestic Non-Stop Large Jet Markets Served from Logan Airport, 2020 and 2021



Source: OAG Analyzer.

Note: There were ten new domestic non-stop large jet routes in 2020/2021, to: Asheville, Bozeman, Destin-Ft. Walton Beach, Grand Rapids, Jackson Hole, Key West, Knoxville, Montrose, Norfolk, and San Antonio.

Figure 2-15 Domestic Non-Stop Regional Jet and Non-Jet Markets Served from Logan Airport, 2020 and 2021



Source: OAG Analyzer.

Note: There were nine new domestic non-stop regional jet routes in 2020/2021, to: Asheville, Bangor, Charlotte-Douglas, Hilton Head, Key West, Miami, Minneapolis/St. Paul, Traverse City, and Wilmington (North Carolina). There were no new routes added on non-jet aircraft.

Changes in International Passenger Service

Total scheduled international passenger operations at Logan Airport fell 65.5 percent in 2020 to 18,801 operations. As foreign governments began to ease international travel restrictions and the U.S. lifted its international travel entry bans in November 2021 to fully vaccinated foreign nationals, these decisions further supported U.S. international air travel demand and contributed to the ongoing international segment's recovery at Logan Airport. In 2021, U.S. flag and foreign flag airlines added back scheduled capacity, increasing international scheduled passenger operations to 22,656 international flights, or 41.6 percent of 2019 levels, as summarized in **Table 2-5.** For details on the changes in operations by carrier, see Appendix E, *Activity Levels*.

In terms of international aircraft operations, flights to Canada declined the most in 2020, where they fell by nearly 77.7 percent compared to 2019 levels. This trend was evident for services to Central/South America (negative 73.7 percent) and Asia (negative 71.2 percent). International market segments declined the most, primarily due to stricter foreign border closures and limited service offered by foreign national carriers from those markets (i.e., Air Canada, LATAM, Copa Airlines, Japan Airlines, Korean Air, etc.). **Table 2-5** shows year-over-year changes in scheduled international passenger operations by market segment and the percent of operations that have recovered in 2020 and 2021 compared to 2019. By year-end 2021, the Bermuda/Caribbean market recovered the fastest to 85.5 percent, driven primarily by pent-up demand for leisure destinations in warm-climates. The shorter distance to the Bermuda/Caribbean markets along with the mix of nonstop service offerings from jetBlue Airways, Delta Air Lines, and American Airlines supported recovery in activity. The international passenger segment at Logan Airport has been recovering slower than the domestic segment as the consequence of government travel restrictions, and

various political, economic and health issues experienced across global markets. The recovery of international travel recovery has been unequal across the regions served by the Airport.

Logan Airport served 53 non-stop international destinations in 2020 and 43 international destinations in 2021, compared to 58 in 2019.[27]

As many international services at Logan Airport were temporarily suspended or discontinued at the height of the pandemic in 2020, the Airport continued to resume those services beginning in the second half of 2020 and throughout 2021. Prior to the pandemic, Logan Airport has welcomed an increasing number of new foreign entrants that provided nonstop international services across both the Atlantic and Pacific Oceans. In addition, the Airport has benefited from Delta Air Lines' and jetBlue Airways' commitment to expand Logan's international network in recent years. Logan Airport's scheduled international air service markets are shown in **Figure 2-16**.

27 OAG Analyzer Schedules.

Table 2-5 Scheduled International Passenger Operations by Market Segment, 2000, 2010, 2015-2021

Category	2000	2010	2015	2016	2017	2018	2019	2020	2021	Percent Change (2019-2020)	Percent Change (2020-2021)	2020 Recovery as Percent of 2019 Levels	2021 Recovery as Percent of 2019 Levels
Canada	26,067	16,399	15,801	17,929	18,590	19,204	17,074	3,808	3,060	(77.7%)	(19.6%)	22.3%	17.9%
Europe/Middle East/North Africa	13,345	12,750	16,251	20,099	20,595	20,167	21,590	7,385	9,180	(65.8%)	24.3%	34.2%	42.5%
Bermuda/Caribbean [1]	3,205	4,116	7,584	8,339	8,690	8,702	9,682	5,925	8,274	(38.8%)	39.6%	61.2%	85.5%
Asia	0	0	1,751	2,156	2,415	2,513	2,854	823	1,008	(71.2%)	22.5%	28.8%	35.3%
Central/South America	314	0	991	1,433	1,829	3,076	3,268	860	1,134	(73.7%)	31.9%	26.3%	34.7%
Total Scheduled International	**42,931**	**33,265**	**42,378**	**49,956**	**52,119**	**53,662**	**54,468**	**18,801**	**22,656**	**(65.5%)**	**20.5%**	**34.5%**	**41.6%**

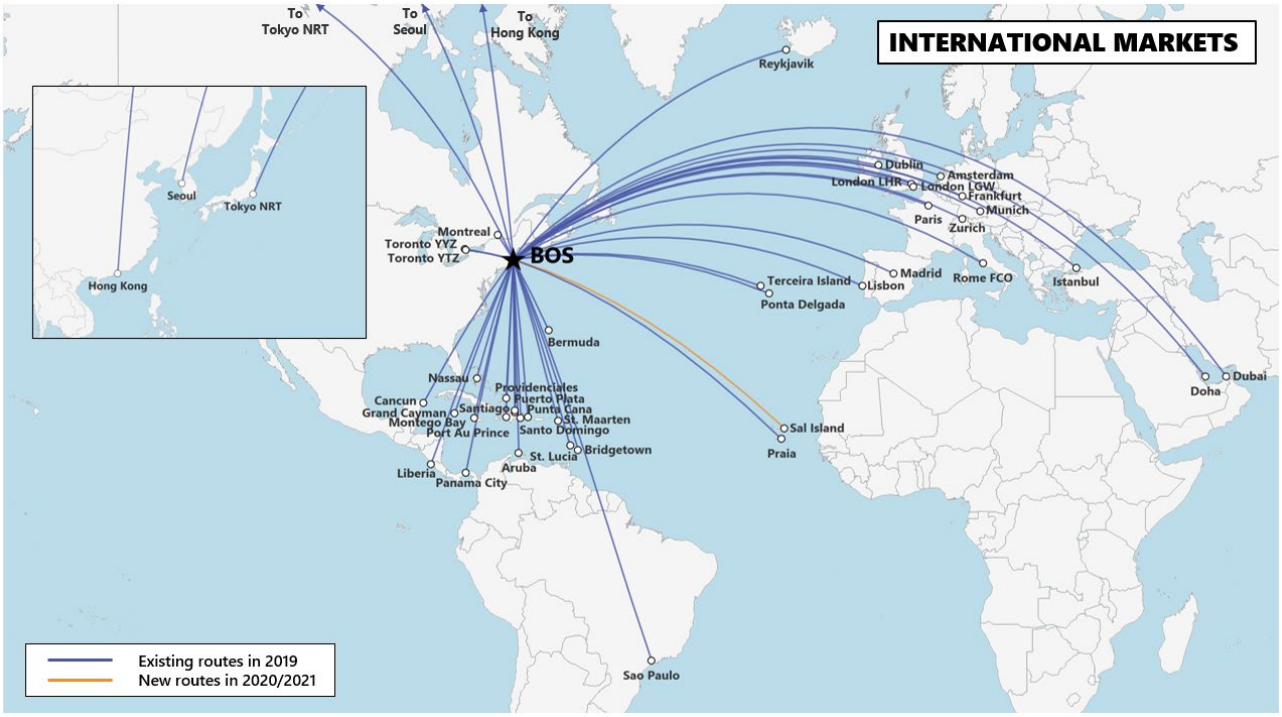
Source: Massport.

Notes: Numbers in parentheses ( ) indicate negative numbers. Avg. Annual Growth rates calculate compound annual growth (CAGR). Compared to the previous EDR report, 2018 operations to Europe declined by 2 as Cargo Lux operations are classified as cargo operations.

N/A Not Available.

1 Includes Puerto Rico and U.S. Virgin Islands.

Figure 2-16 International Non-Stop Markets Served from Logan Airport, 2020 and 2021



Source: OAG Analyzer.

Note: In 2020, TAP Portugal commenced non-stop services to Ponta Delgada, which was already services by SATA-Azores Airlines in July 2020. Eastern Airlines, re-branded and entered the Boston market, operating limited flights to Port-au-Prince and Santo Domingo starting December 2020. American Airlines commenced operations to Grand Cayman and Nassau prior to the pandemic in January 2020.

In 2021, Logan Airport welcomed ULCC, Condor, which offered non-stop service to Frankfurt beginning August 2021. Frontier Airlines was another ULCC that commenced international service, with flights to Cancun in December 2021. Delta expanded its transatlantic offerings, connecting Reykjavik and Rome in May 2021, and August 2021, respectively. American Airlines also launched direct service to London Heathrow in June 2021.

Cargo Activity Levels in 2020 and 2021

In 2021, Logan Airport ranked 25th among U.S. airports in total air cargo volume.[28, 29] Total air cargo volume at Logan Airport declined to 600 million pounds in 2020, compared to over 717 million pounds in 2019; however, increased to 649 million pounds in calendar year 2021, which represents 90.5 percent of 2019 volumes. Air cargo is carried either in the belly compartments of passenger aircraft or by dedicated all-cargo carriers such as FedEx, UPS, and DHL in all-cargo aircraft. The express/small package segment continued to dominate Logan Airport cargo activity, accounting for 70.9 and 62.5 percent of the total non-mail cargo volumes in 2020 and 2021, respectively.

Table 2-6 shows all-cargo aircraft operations and cargo volumes at Logan Airport for 1990, 2000, 2010, and 2015 to 2021. In both 2020 and 2021, the number of dedicated all-cargo aircraft operations at Logan Airport exceeded 2019

28 U.S. DOT. T-100 Database. Total cargo volume includes mail.

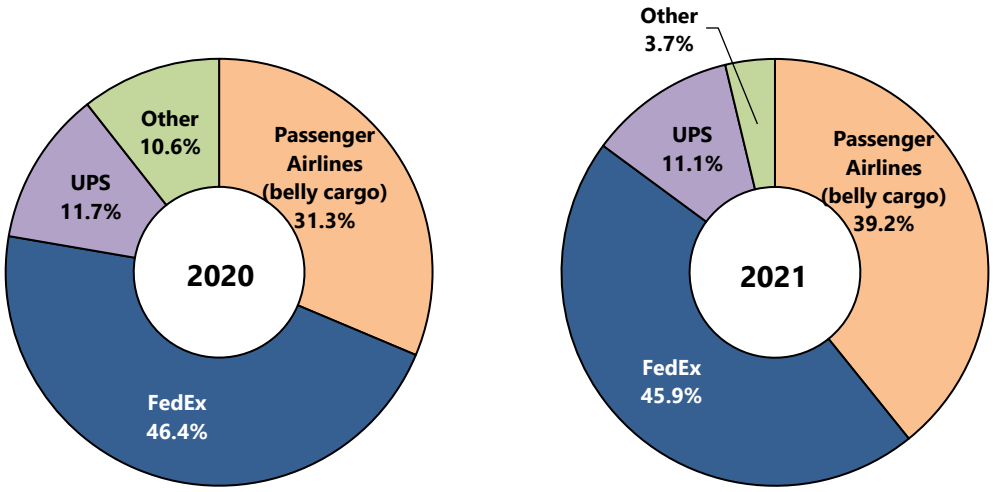
29 Air cargo includes express/small packages, freight, and mail.

cargo activity levels by 10.9 percent and 13.8 percent, respectively, although total cargo volumes remain below 2019 cargo levels.

Compared to 2000, all-cargo operations during 2021 at Logan Airport have declined by 36.7 percent, while total cargo volume has declined by 38.0 percent. Several factors are responsible for the decline over the last two decades in cargo shipments (including freight, express, and non-express mail and packages) at Logan Airport, as well as nationally. Cargo carriers, particularly the integrators that provide door-to-door delivery services, have significantly increased their use of trucks to move cargo in shorter-haul markets because it is more cost-effective than air transport. In addition, the widespread acceptance and use of the internet and e-mail has greatly reduced mail volumes overall.

- FedEx was the largest air carrier by cargo volume carried through Logan Airport in 2020 and 2021, transporting over 278 and 297 million pounds[30] (representing 46.4 and 45.9 percent of Logan Airport's cargo volume), respectively.
- FedEx was the 10th largest air carrier at the Airport in terms of total flights in 2020 and in 2021, increasing its rank from 16th in 2019, supported by fewer passenger aircraft operations.[31]
- UPS was the next largest cargo operator and accounted for 11.7 percent and 11.1 percent of Logan Airport's cargo volume in 2020 and 2021, respectively.
- Passenger airlines carried the greatest share of 31.3 percent, or 188 million pounds, of Logan Airport's cargo as belly cargo in 2020, and 39.2 percent, or 255 million pounds in 2021, compared to 412 million pounds and 395 million pounds flown on all-cargo carriers in 2020 and 2021, respectively (see **Figure 2-17)**.

Figure 2-17 Cargo Carriers – Share of Logan Airport Cargo Volume, 2020 and 2021



Source: Massport.
Note: Includes mail. Passenger airlines carry cargo as belly cargo; Wiggins Airway and Mountain Air Cargo operated for FedEx; 21 Air, ABX Air, Atlas Air, Cargo Jet, and Kalitta Air operated for DHL (grouped as part of "Other")

30 This includes express/small packages, freight, and mail.
31 Massport. 2019.

Cargo Trends in 2020 and 2021

As the world reels from the outbreak of COVID-19, air freight continues to operate worldwide. Perhaps never in modern history has such attention been put on this industry and its vital role in providing medical equipment and other necessities.

While people around the world adjusted to social distancing and remote working, logistics companies worked diligently to resolve disruptions and circumvent supply chain issues. The grounding of a large number of passenger aircraft led to the loss of a sizeable share of cargo capacity (i.e., "belly" cargo). Approximately 40 to 45 percent of international air freight consist of belly cargo; massive groundings of passenger aircraft are affecting countries/airports differently, where in some instances, carriers have converted older passenger aircraft into combi aircraft[32] to carry out cargo missions that generate higher revenue. All-cargo aircraft continue to fly but not without challenges.

Air cargo volumes have been more resilient to coronavirus pandemic-related effects than passenger traffic activity. According to the U.S. T-100 databases, the 10 largest U.S. cargo airports, which have yet to recover total passenger volumes in aggregate as of the latest 12-month period ending December 2021 with international travel lagging in recovery, cargo volumes have seen greater recovery rates, having exceeded 2019 levels by over 15 percent. Among the top 10 airports, Anchorage, Chicago O'Hare, Indianapolis, and Los Angeles have exceeded 2019 onboard cargo volumes (including mail) by more than 25 percent.

At Logan Airport, cargo declined year-over-year by around 16.3 percent in 2020, but increased to 649 million pounds in 2021, which represents a 90.5 percent recovery of 2019 cargo and mail volumes. Domestic mail and express/small package markets are seeing modest increases in volume associated with the online shopping and E-commerce trends associated with the pandemic. In 2020, express/small package volumes at Logan Airport exceeded 2019 levels by 3.2 percent, adding over 12.7 million pounds. However, express/small packages fell by 5.4 percent in 2021 to 232.0 million pounds compared to its 2020 volume of 167.6 million pounds. Mail volumes also exceeded 2019 levels in 2021 by 9.6 percent, after having recovered 87.4 percent of 2019 levels (or 24.9 million pounds) the year prior. As of 2021, freight had recovered less than 80 percent to 2019 levels, primarily due to the slow recovery of international freight that is typically flown as passenger belly cargo on foreign flag carriers.

32 Combi aircraft in commercial aircraft are aircraft that can be used to carry both passengers and/or cargo.

Table 2-6 Cargo and Mail Operations and Volume (1990, 2000, 2010, 2015–2021)

Category	2000	2010	2015	2016	2017	2018	2019	2020	2021	Pct. Change (2019-2020)	Pct. Change (2020-2021)	2020 Recovery as Pct of 2019 Levels	2021 Recovery as Pct of 2019 Levels
All-Cargo Aircraft Operations [1]	12,282	6,724	6,059	6,680	6,744	6,814	6,830	7,576	7,773	10.9%	2.6%	110.9%	113.6%
Volume (lbs.)													
Express/Small Packages	484,490,143	339,485,424	336,013,472	352,551,369	376,009,078	396,304,856	395,108,073	407,904,726	385,957,887	3.2%	(5.4%)	103.2%	97.7%
Freight	367,857,011	206,893,979	239,768,129	264,382,330	303,398,899	307,895,701	293,831,074	167,567,238	232,004,509	(43.0%)	38.5%	57.0%	79.0%
Mail	194,902,513	25,904,205	30,556,356	23,215,743	29,271,688	31,481,901	28,536,921	24,954,698	31,268,249	(12.6%)	25.3%	87.4%	109.6%
Total Cargo and Mail Volumes	**1,047,249,667**	**572,283,608**	**606,337,957**	**640,149,442**	**708,679,665**	**735,682,458**	**717,476,068**	**600,426,662**	**649,230,645**	**(16.3%)**	**8.1%**	**83.7%**	**90.5%**

Source: Massport.

Notes: Compared to the previous EDR report, all-cargo aircraft operations increased by 2 in 2018, as it now includes Cargolux operations. Amerijet is classified as a dedicated all-cargo operator.

Pct. Percent.

1 Dedicated all-cargo operations only.

This Page Intentionally Left Blank.

3

Airport Planning

This *2020/2021 Environmental Data Report* (EDR) was prepared in 2022 during the continuing COVID-19 worldwide pandemic. This EDR focuses primarily on two calendar years, 2020 and 2021; as was the case for the *2018/2019 EDR*, Massport has included more recent updates through fall 2022, where appropriate. Due to the COVID pandemic, beginning in March 2020, flights in and out of Boston Logan International Airport (Logan Airport or the Airport) were dramatically reduced and passenger levels dropped by over 90 percent in the spring and summer of 2020. While there was slow recovery in late 2021 and early 2022, as of this filing, Logan Airport is not yet seeing activity levels (aircraft operations and passengers) comparable to 2019. For the first 8 months of 2022 (January to August), operations were down approximately 13 percent and passengers were down approximately 18 percent compared to the first 8 months of 2019.[1]

As a result of this significant reduction in Airport activity and dramatic reduction in revenues through 2020 and 2021, Massport, airlines, and other Logan Airport tenants necessarily adjusted their operations. The schedules for a number of Massport and tenant Airport projects and programs were also adjusted. Massport continues to review the status of its projects/programs, and additional changes or deferments continue to occur in response to activity levels and revenues. Of particular note is the careful and continuing review of Logan Airport's ground access programs to remain aligned with ridership levels and long-standing high-occupancy vehicle (HOV) transportation services. Despite these challenges, Massport remains committed to implementing project-related mitigation strategies, as documented in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*. Forthcoming EDRs and Environmental Status and Planning Reports (ESPRs) will continue to provide updates, as available.

Introduction

Prior to the COVID pandemic, the increase in the number of Logan Airport's air passengers through early 2020 was attributed to the then strong local, regional, and national economies. In response to that strong growth, Massport was implementing a range of measures to address both operational and environmental challenges to allow Logan Airport to continue to operate in a sustainable and environmentally responsible way. Logan Airport is a key economic and transportation resource in the New England region, the State, and the Boston metropolitan area, which is home to a broad range of industries and institutions. In addition to supporting the growth and economic success of the state, Logan Airport and the airport industry are important elements in the regional economy. Massport is committed to allowing Logan Airport to responsibly evolve and continue to be an important resource as the region and the country recover and adjust to a post-COVID reality.

1 Massport. Logan Airport Statistics. https://www.massport.com/logan-airport/about-logan/airport-statistics/

This chapter updates the status of Logan Airport planning and development projects through 2020 and 2021 and includes available updates through the end of September 2022. Specific topics include terminal area projects, service area projects, buffer/open space projects, Airport parking projects, airside area projects, HOV improvements, and Airport-wide projects. Given the timing of the publication of this *2020/2021 EDR*, **Table 3-1** presents the status of recent progress on planning initiatives and individual projects at Logan Airport, as well as planned projects and projects under consideration. During the pandemic, due to financial constraints, Massport placed significant elements of the Capital Improvement Plan (CIP) program on hold. Massport will be continuously evaluating projects as Logan Airport (and other Massport businesses) recover.

As discussed in Chapter 1, *Introduction/Executive Summary,* of this *2020/2021 EDR,* all Massport and tenant projects that trigger a threshold under the Massachusetts Environmental Policy Act (MEPA) or the National Environmental Policy Act (NEPA) undergo the appropriate project-specific state and/or federal environmental review. This chapter provides an overview of planned projects to provide context for understanding the cumulative effects of Logan Airport activities.

Massport's priority planning projects and initiatives include the following categories:

- Ground Transportation and Parking;
- Terminals;
- Airside Planning;
- Service Areas;
- Airport Buffers and Open Space; and
- Energy, Sustainability, and Resiliency.

Ground Transportation and Parking Planning

Ground access and parking remain priority planning interests, with a focus on HOV growth, management of RideApp services such as Uber and Lyft, parking management, and on-Airport roadway operations, safety, and congestion management.

In 2020 and 2021, Massport necessarily adjusted its ground access strategy in response to much lower passenger levels and a dramatic shift in employee and passenger public transportation ridership due to COVID-19 concerns. In 2019, more than a quarter of on-Airport traffic was from activities related to RideApp (formerly known as Transportation Network Company [TNC]) activity, which contributed to unprecedented congestion on Airport roadways. In an effort to reduce congestion, emissions, and RideApp deadhead[2] activity, Massport relocated RideApp drop-off/pick-up activity to the ground floor of the Central Parking Garage complex in December 2019, with the exception of drop-off at terminal curbs during the 4:00 AM to 10:00 AM peak departure period. The new drop-off/pick-up area provides weather-protected and climate-controlled areas for passengers, and other amenities. Dedicated curbside locations are reserved at each terminal for drop-off/pick-up accommodations for persons with disabilities. While overall RideApp use was dramatically

2 Deadhead trips are those trips to or from the Airport that do not contain a passenger.

reduced in 2020 and 2021, Massport continued to actively manage these ground access modes to reduce trips where possible. Additionally, reduced fees are offered for shared rides. Terminal B RideApp pick-up and drop-off operations from the ground floor of the Central Garage are in the process of being moved to the second floor of the Terminal B Garage. This will provide 60 spaces, including three Americans with Disabilities Act (ADA) accessible and four electric vehicle (EV) spaces. This new location is anticipated to open in November 2022.

Massport's long-standing parking management strategy focuses on parking supply, pricing, and operations to promote the use of HOV, transit, and shared-ride options, and to reduce environmentally harmful drop-off/pick-up modes. In accordance with the approvals by the Massachusetts Department of Environmental Protection (MassDEP) and the U.S. Environmental Protection Agency (EPA) to modify the Logan Airport Parking Freeze, Massport received state and federal approvals to build an additional 5,000 commercial parking spaces at Logan Airport in a new garage in front of Terminal E and by expanding the Economy Garage. Those projects remain on hold at this time.

Several projects aimed at providing on-Airport roadway congestion relief are ongoing and expected to be complete by summer of 2023, namely:

- On-Airport roadway improvements to enhance efficiency and reduce congestion;
- Roadway and curb improvements in front of Terminal C (Arrival and Departure levels) to reduce peak hour congestion and prioritize HOV access;
- Relocation of the RideApp traffic for Terminal B from the Central Garage to the Departures level of Terminal B;
- Construction of roadways exiting the Terminal B departures level that will allow traffic to exit in its own lane, rather than merging with traffic destined for Terminals C and E;
- Installation of a tunnel exiting the Terminal B garage that will allow traffic to exit in its own lane on the Arrivals level, rather than merging with traffic destined for Terminals C and E; and
- Improvements to the roadways connecting Terminals B and C to improve circulation and safety, and reduce congestion.

Terminal Area Planning

Massport completed the Terminal B Optimization Project in 2019, which upgraded the security checkpoints and added substantial passenger amenities primarily for American Airlines and Air Canada. Enhanced post-security connections between Terminals B and C were completed in 2022 to optimize passenger movements and security. Other enhancements include expanded passenger amenities for current and future passenger needs. Feasibility studies of post-security connections between Terminal A and Terminal B, and Terminal A and Terminal E were also initiated. Construction of the first phase of the Terminal E Modernization Project is underway and will add four gates[3] to the international terminal. Phase 1 is expected to be completed in 2023. Phase 2 is currently deferred but will ultimately add three additional gates, for a total of seven gates.

3 The Terminal E Modernization Project will add the three gates approved in 1996 as part of the International Gateway West Concourse project (EEA # 9791), but never constructed, and add an additional four gates.

Table 3-1 Logan Airport Short- and Long-Term Planning Initiatives

	Status as of September 30, 2022	Completion	
		Short-Term	Long-Term
		By End of 2025	By End of 2035
Airport Ground Transportation and Parking Projects/Planning Concepts			
Logan Airport Parking Project (additional 5,000 spaces)	Permitted/Deferred		✈
Logan Airport Parking Project: Parking Freeze Studies	Studies Complete (2019)		
RideApp Infrastructure Improvement and Policy	Complete (2019)		
Logan Express Route and Facility Expansion (off-Airport)	Feasibility/Planning	✈	✈
Terminal Area Projects/Planning Concepts			
Terminal E Modernization (Phase 1 – 4 gates/Phase 2 – 3 gates)	Phase 1 – Construction Phase 2 – Deferred	Phase 1 ✈	
Convenience and Filling Station/ Taxi Pool/RideApp Lot Relocations	Complete (2019)		
Terminal B Optimization	Complete (2019)		
Terminal C, Pier B Optimization	Complete (2019)		
Terminal C Canopy, Connector, and Roadway Project	Construction	✈	
Terminal A to B Airside Connector	Feasibility/Planning		✈
Airside Projects/Planning Concepts			
Runway 9-27 Runway Safety Area (RSA) Improvement Project	Planning/Permitting	✈	
Runway 15-33 Rehabilitation Project	Planning/Permitting	✈	
Runway Incursion Mitigation (RIM) Study and Comprehensive Airfield Geometry Analysis	Complete (2019)		
Service Area Projects/Planning Concepts			
Logan Airport Runway Protection Zone (RPZ) Enhancements, Equipment Storage, and Maintenance North Service Area (NSA)	Planning/Permitting	✈	
Jet Fuel Storage Addition – NSA	Construction	✈	
Governors Island Equipment Storage	Feasibility		✈
Relocated Compressed Natural Gas (CNG) Station – North Carg Area (NCA)	Feasibility/Planning	✈	
Cargo Through-put Facility	Feasibility/Planning	✈	
Replacement Cargo Facilities – NCA	Feasibility		✈
Joint Operations Center (JOC)	Feasibility/Planning		✈
Airport Buffers/Open Space Projects[1]			
Piers Park Phase II	Construction	✈	
Piers Park Phase III (*by others*)	Feasibility		✈
Net Zero and Resiliency Planning			
Energy Planning	Ongoing	✈	✈
Electric Ground Service Equipment (eGSE) installation	Ongoing	✈	✈
Sustainability and Resiliency Planning	Ongoing	✈	✈

Notes: Anticipated completion dates and status as of September 30, 2022, as denoted by ✈.
Short-term projects are anticipated to be completed by 2025 and long-term projects are anticipated to be completed by 2035. Details of each project or planning concept are provided in the sections that follow.

1 **Figure 3-8** and **Table 3-6** includes the previously completed Airport buffer/open space projects that were completed from 1995 to 2016.

Airside Planning

Massport continues to upgrade and improve the airfield to enhance the operational efficiency and safety of Logan Airport while exploring ways of efficiently using the limited land resources in the service areas. In coordination with the Federal Aviation Administration (FAA), Massport is working on concept design and permitting for enhancement of the runway safety area (RSA) of Runway 27. Based on the current level of planning and permitting, the RSA improvements will include a pile-supported deck over Boston Harbor at the approach-end of Runway 27. Construction of the RSA improvements will be advanced once environmental approvals are secured and design is complete. Initial environmental review and permitting commenced in late 2021. An Environmental Notification Form (ENF) was filed with the MEPA Office in August 2021 and the Draft Environmental Impact Report (DEIR) was filed in June 2022. A Final Environmental Impact Report (FEIR) and filing under NEPA are in development. Construction is currently projected for 2025 and 2026.

Service Area Planning

Massport is continually undertaking service area improvements to maximize efficient use of limited land resources and respond to the changing needs of airline businesses, customers, and tenants. Among several planned improvements, Massport is exploring options to improve the layout of the North Service Area (NSA) by reorganizing critical airfield support equipment and storage facilities, and to enhance safety and efficiency of activities located within the runway protection zone (RPZ). Massport issued a Request for Information (RFI) and is in the process of evaluating a replacement of the current fixed-based operator (FBO) facility located in the NSA. In addition, construction of an additional jet fuel storage tank in the NSA commenced in 2022 and is expected to be completed in 2024.

Airport Buffers and Open Space Planning

Massport has invested in an extensive open space program to enhance the surrounding communities. Massport initially committed over $15 million for the planning, construction, and maintenance of four Airport edge buffer areas and two parks along Logan Airport's perimeter. These buffers include the Bayswater Embankment Airport Edge Buffer, Navy Fuel Pier Airport Edge Buffer, Neptune Road Airport Edge Buffer, and the Southwest Service Area (SWSA) Airport Edge Buffer (Phases I and II). The award-winning Piers Park was completed in 1995 and has since become part of a network of greenspace that traverses East Boston from the Jeffries Point waterfront to Constitution Beach. In 2014, Massport completed construction of the East Boston Greenway Extension that connects Bremen Street Park to Wood Island Marsh. In 2016, Massport assumed operations of the City's Greenway extension to Constitution Beach. In October 2019, the East Boston Greenway was renamed Mary Ellen Welch Greenway, after a long-time East Boston community activist.

Adjacent to the current Piers Park, Piers Park Phase II will add approximately 4.2 acres of green space to the East Boston waterfront upon completion. Construction for Piers Park II commenced in October 2022 and is scheduled to be complete by the end of 2023. Studies are also underway by the Trustees of Reservations for a Piers Park Phase III, which would turn an aging pier into a 3.6-acre greenspace including resiliency features to help protect the neighborhood from flooding and sea level rise. As of this filing, the Trustees have begun outreach to community stakeholders to receive input for the design of the waterfront park. Today, East Boston

enjoys 3.3 miles and more than 33 acres of green space developed or managed by Massport, in partnership with and in response to engagement with the East Boston community.

Energy, Sustainability, and Resiliency Planning

Massport has a legacy of incorporating sustainability elements into its projects and operations. 2021 marked the beginning of a new climate action planning initiative with an initial focus on an Authority-wide phased decarbonization program. In early 2022, Massport released its *Roadmap To Net Zero by 2031*(https://www.massport.com/massport/about-massport/roadmap-to-net-zero/) which outlines five key pathways for Massport to follow towards net zero operations.

While the *Roadmap to Net Zero by 2031* outlines a series of Authority-wide goals, many Logan Airport-specific initiatives continue to be advanced, as follows:

- Facilitating the replacement of gas- and diesel-powered airfield ground service equipment (GSE) with all-electric GSE (eGSE), as commercially available.
- Studying opportunities to maximize solar installations across Logan Airport and installing EV infrastructure on the airside and in the parking garages.
- In 2018, Massport was awarded an FAA Voluntary Airport Low Emission (VALE) Program grant of $1,600,000 for charging infrastructure at Terminal B. Massport contributed $626,000 in matching funds to install 50 eGSE charging stations. In 2019, through the same program, Massport was awarded $3,200,000 for charging infrastructure at Terminal C. Massport contributed $953,000 toward the installation of 42 eGSE charging stations.
- In 2019 Massport was awarded by the EPA under the Diesel Emission Reduction Act (DERA) a $990,000 grant to replace 44 diesel-powered GSE equipment with all-electric baggage tractors, belt loaders, and push back tugs. GSE owners at Logan Airport will contribute a $1,210,000 match.
- In 2019, Massport, in partnership with jetBlue, was awarded $445,000 through MassDEP's Volkswagen Diesel Settlements & Environmental Mitigation Open Solicitation grant program. The grant, aimed at reducing nitrogen oxide (NO_X) and greenhouse gas (GHG) emissions, will support the replacement of 31 pieces of GSE with new eGSE and install four eGSE charging stations at Terminal C. United Airlines also privately pursued this grant and was awarded $280,000.
- In 2020, Massport was awarded a grant through FAA's VALE for charging infrastructure at Terminal E and Signature Aviation Building 14 to install 10 eSGE charging stations.
- Massport is collaborating with the Massachusetts Clean Energy Center (MassCEC) to study opportunities to enable conversion of the ride-for-hire fleet (RideApp, Rental Car Taxi and limousine vehicles) that serves Logan Airport to transition to EV. In early 2022, MassCEC provided a grant to initiate this work and provide some funding to increase Logan's EV charging infrastructure.
- Massport has a robust program to identify vulnerabilities from climate and other natural threats on the Airport and is now incorporating resilient infrastructure design standards for existing and future flood levels for all types of Airport projects.

Ground Transportation and Parking Planning

Massport has a robust ground transportation strategy, which includes ongoing operational and capital commitments to the Logan Express services, the Massachusetts Bay Transportation Authority (MBTA) Silver Line 1 (SL1) service, and MBTA Blue Line station shuttles, as well as continued partnership with and marketing of private bus carriers.

As discussed in Chapter 1, *Introduction/Executive Summary*, this EDR focuses primarily on activity in 2020 and 2021. As a result of the pandemic, a number of Massport's broad HOV and trip reduction measures were temporarily adjusted beginning in 2020 in response to reduced ridership. While operational and passenger levels are recovering, overall, there remain fewer passengers and employees traveling to and from Logan Airport using HOV transportation services like buses, rapid transit, and commuter rail, due to continuing concerns about the COVID-19 virus and overall transit service schedule reductions. This is evidenced by the need for Massport to use overflow parking again. At this time, all suspended Logan Express services have been restored.

Within that context, Massport continues to evaluate and plan for the recovery of air passenger activity and remains committed to implementing the broad range of ground access strategies that were outlined in the *2017 ESPR*. The schedule for those planned improvements has, however, been adjusted due to the continuing operational constraints and revenue reductions. Massport continues to carefully review both on and off-Airport activity levels and will adjust its ground access programs to align with ridership level. Future ESPRs and EDRs will provide detailed updates on all service adjustments and activity levels.

HOV Investment

Massport continuously evaluates strategies and programs aimed at improving and, where needed, expanding HOV services to and from Logan Airport, including continued investment in Logan Express facilities and service. Expanding HOV service is aimed at reducing vehicle miles traveled (VMT), congestion, and air quality emissions by shifting riders from other vehicle modes. In response to recovering activity levels at Logan Airport, all Logan Express services have been restored.

At suburban locations, Massport proposes the following action plan:

- Increase Braintree Logan Express service from two to three trips per hour (implemented in May 2019 but reduced to hourly service in March 2020 due to the impacts of COVID-19. In July 2021, service resumed to every half hour).
- Add approximately 1,000 additional spaces to the Framingham garage (permitting completed in 2020, however construction is deferred).
- Marketing to support Logan Express strategy and increase ridership.
- Implement Logan Express electronic ticketing (completed in March 2021).
- Evaluate new Logan Express suburban locations, with a plan to open at least one new site. Peabody Logan Express relocated in February 2022. Massport is evaluating opportunities for further expansion of capacity and service.

- Explore RideApp Last Mile connections.
- Continue to monitor parking capacity at all Logan Express sites.

Until March 2020 when service was suspended due to the drop in ridership, the Back Bay Logan Express operated daily between the hours of 5:00 AM and 10:00 PM. Initially, one-way fares to Logan Airport were $7.50 per passenger. Riders with a current, valid MBTA pass received a reduced $3.00 fare. In mid-2019, Massport implemented a number of improvements to the service with a focus on boosting urban Logan Express ridership:

- Change pick-up/drop-off location from Copley to Back Bay Station (implemented in 2019);
- Discount one-way fare from $7.50 to $3.00 (implemented in 2019);
- Free service from Logan Airport (implemented in early 2019);
- Pilot priority security line status for riders (implemented in 2019);
- Execute marketing campaign to support increased ridership (ongoing);
- Implement Logan Express electronic ticketing (anticipated upon reopening in October 2022);
- Explore a second urban Logan Express service; and
- Provide security line priority status to Logan Express Back Bay riders (implemented in 2019).

The Back Bay Logan Express service restarted in October 2022.

Eight Silver Line buses, connecting the Airport to South Station, were purchased in 2005 by Massport and are operated by the MBTA, with Massport paying operating costs. In 2017, Massport funded mid-life rebuilds of four Silver Line buses and rebuilt four additional buses in 2018. The mid-life rebuild extends the useful life of each vehicle by approximately eight years. This will allow the MBTA to maintain reliability and quality of operations along the Silver Line today while initiating the procurement process to acquire new vehicles in the future. Since the existing Silver Line fleet is reaching the end of its useable life, the MBTA and Massport have been working together on a plan to procure a replacement Silver Line fleet. As part of this initiative, Massport and the MBTA developed a *Silver Line Capacity Study* to determine the mid-term fleet and facility needs as well as to assess other ways to improve the reliability and capacity of the system. Based on this analysis, the MBTA has initiated procurement of 45 new enhanced electric hybrid vehicles to replace the existing fleet of 32 dual mode vehicles. Massport has agreed to purchase eight MBTA Silver Line buses as part of the MBTA's current procurement; those buses are scheduled to be delivered in 2023. Chapter 5, *Ground Access to and from Logan Airport*, provides additional information on these efforts.

Starting with the *2019 Logan International Airport Air Passenger Ground-Access Survey*, Massport used an updated HOV definition where vehicle occupancies of taxis, black car limousines, and RideApp vehicles that exceed one air passenger per vehicle are considered HOV, while the same modes with one air passenger count as non-HOV. With this updated definition, Massport has a goal of reaching 35.5 percent HOV by 2022 and 40 percent HOV by 2027.

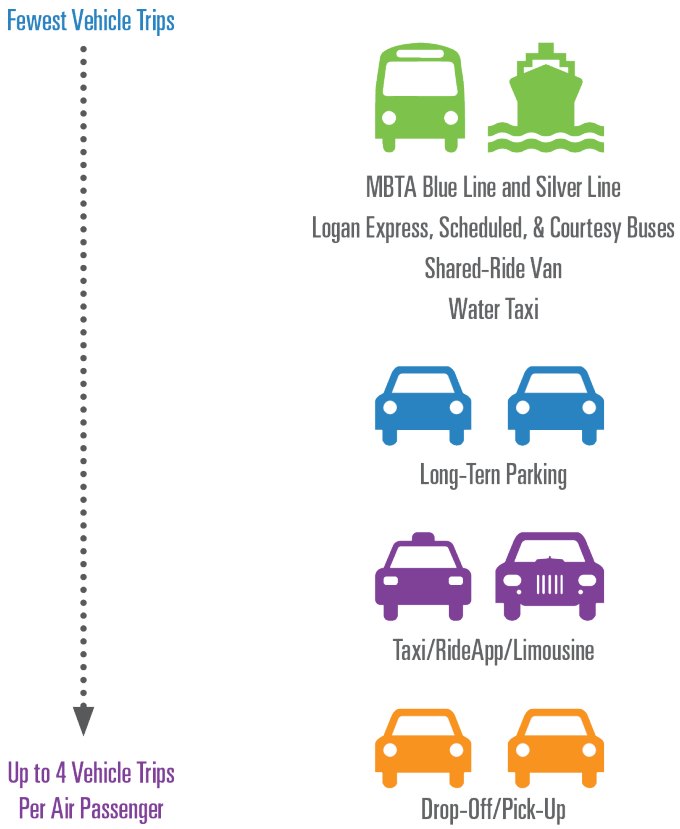
Progress towards Massport's HOV goal is measured using the triennial Air Passenger Ground-Access Survey. The latest published survey, conducted in 2019, revealed an air passenger ground access mode share of 40.4 percent for HOV and shared-ride modes, exceeding both near-term and longer-term goals. COVID-19 has had a range of impacts on ground transportation, particularly on the use of ground access HOV modes. While

HOV mode share dropped as a result of COVID-19 over the short term, Massport expects HOV ridership to recover over time and is striving towards the HOV mode share goals going forward. A new Air Passenger Ground-Access Survey was conducted in spring 2022; the *2022 ESPR* will present the results of that survey.

Parking Management

Massport continues to manage parking supply, pricing, and operations to promote the use of HOV, transit, and shared-ride options and to reduce drop-off/pick-up modes. As air traveler numbers increased through early 2020, the constrained parking supply at Logan Airport, resulting from the Logan Airport Parking Freeze, had periodically had the unintended consequence of causing an increase in environmentally harmful drop-off/pick-up vehicle trips. The goal of the Logan Airport Parking Project is to reduce the use of drop-off/pick-up modes, which generate up to four vehicle trips instead of two (**Figure 3-1**). While the intent of the Logan Airport Parking Freeze has been to shift air passengers to HOV travel modes with lower VMT, survey data collected from the 1970s to the present at Logan Airport have consistently shown that if parking was not an option for passengers who parked on-Airport, 77 percent of diverted parkers would use drop-off/pick-up modes-generating a higher level of VMT and associated air emissions (**Figure 3-1**).

Figure 3-1 Ground-Access Mode Choice Hierarchy (Based on Vehicle Trips Per Passenger)



Source: VHB.
Notes: Short-term parking is included under "drop-off/pick-up."
Rental cars are included in the number of Parked Vehicles.

Table 3-2 describes plans for commercial parking projects at Logan Airport.

In 2017, the Logan Airport Parking Freeze regulation was revised to allow for an increase of 5,000 on-Airport commercial parking spaces to alleviate constrained parking conditions on-Airport. Until the recent amendments to the Logan Airport Parking Freeze, the total number of employee and commercial parking spaces permitted at Logan Airport was limited to 21,088 spaces under the State Implementation Plan (SIP) and MassDEP air quality regulations; the amendment has increased the limit to 26,088 spaces (there was no increase in the number of employee parking spaces). While design of the initial project phase (2,000 spaces in a new garage at the existing surface parking lot in front of Terminal E) commenced in 2019, that project is currently deferred. **Figure 3-2** shows the proposed sites for new parking garage facilities.

In accordance with the modified Logan Airport Parking Freeze approved by MassDEP and the EPA, to allow for an additional 5,000 commercial parking spaces at Logan Airport, Massport completed three key Logan Airport ground access studies, also known as the *Logan Airport Parking Freeze Amendment Ground Access and Trip Reduction Strategy Studies*. The findings of these studies were initially published as part of the Logan Airport Parking Project FEIR/Environmental Assessment (EA) in December 2019, and are available on Massport's website: http://www.massport.com/media/3370/final-massport-dep-report.pdf.

FIGURE 3-2 Location of Airport Ground Access Projects/Planning Concepts

2020/2021 Environmental Data Report

Notes: See Table 3-2 for a description of the numbered projects. Status as of September 30, 2022.

1a. Logan Airport Parking Project - Economy Garage
1b. Logan Airport Parking Project - Terminal E Surface Lot

Airport-Wide or Location To Be Determined

2. Logan Airport Parking Project: Parking Freeze Studies
3. RideApp Infrastructure and Policy
4. Logan Express Route and Facility Expansion (Off-Airport)

0 500 1000 2000 Feet

Table 3-2 Description and Status of Airport Ground Access Projects/Planning Concepts (September 30, 2022)

Description	Status
1. Logan Airport Parking Project (additional 5,000 spaces) As one element of its comprehensive transportation strategy, Massport has proposed the phased construction of 5,000 new on-Airport commercial parking spaces at Logan Airport in two locations. This project would include construction of a 2,000-space structured garage in the parking lot in front of Terminal E and a 3,000-space addition to the Economy Garage. Each of the proposed garages will be designed in accordance with Massport's Sustainable Design Standards and Guidelines and incorporate measures from the U.S. Green Building Council's Parksmart rating system, an environmental and sustainability focused rating system specific to parking structure management, programming, design, and technology.	The Massachusetts Department of Environmental Protection (MassDEP) issued the amended regulation on June 30, 2017 approving the requested parking increase. On December 5, 2017, the U.S. Environmental Protection Agency (EPA) proposed a rule approving the revision of the Massachusetts State Implementation Plan (SIP) incorporating the amended Logan Airport Parking Freeze. The final rule was issued on March 6, 2018 and became effective on April 5, 2018. Massport initiated a parallel process with the Executive Office of Energy and Environmental Affairs (EEA) by filing an Environmental Notification Form (ENF) for new parking facilities on March 31, 2017. A Secretary's Certificate on the ENF was issued on May 5, 2017 establishing the scope for the required Draft Environmental Impact Report (EIR). The Draft EIR/Environmental Assessment (EA) was published in May 2019. The Final EIR/EA was filed in November 2019 and the Secretary's Certificate was issued on January 30, 2020. Massport is currently advancing final design for the first 2,000 spaces in the parking lot across from Terminal E. Both phases are deferred, due to the reduction in passenger activity associated with the pandemic.
2. Logan Airport Parking Project: Parking Freeze Studies (Airport-wide) In accordance with the June 2017 approval by MassDEP and the April 2018 approval by the EPA to modify the Logan Airport Parking Freeze to allow for an additional 5,000 commercial parking spaces, Massport has taken steps to advance three key ground access studies. These include analyzing the feasibility and effectiveness of the following: ▪ Potential services and improvements to high occupancy vehicle (HOV) access; ▪ Possible pricing strategies for different modes; and ▪ Potential operational measures to further reduce drop-off/pick-up modes.	The findings of these studies were initially published as part of the Logan Airport Parking Project Final EIR/EA in December 2019, are available on Massport's website: http://www.massport.com/media/3370/final-massport-dep-report.pdf.

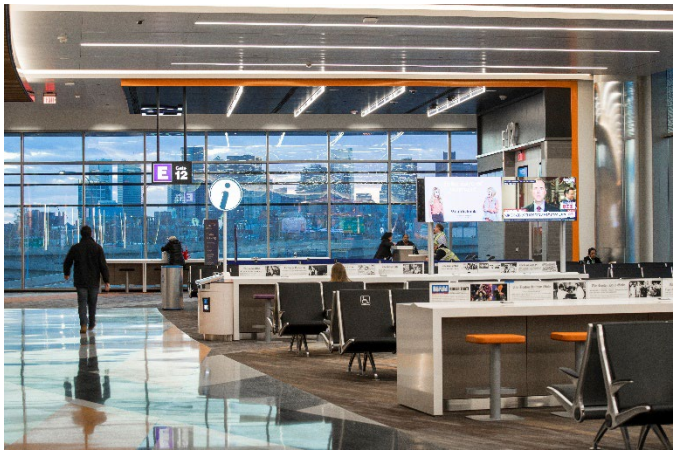
Table 3-2 Description and Status of Airport Ground Access Projects/Planning Concepts (September 30, 2022) (Continued)

Description	Status
3. RideApp (formerly Transportation Network Company) Infrastructure and Policy (Airport-wide)	
Massport began tracking and reporting RideApp service (such as Uber and Lyft) activity in 2017. RideApps are estimated to contribute approximately 15,000 vehicle trips per day (excluding deadhead trips). RideApp operations are adversely impacting other modes to the Airport and contributing to on-Airport congestion. As RideApps have become an increasingly popular option for travelers going to and from Logan Airport, Massport has and will continue to develop strategies to facilitate efficient operation of all modes of ground transportation. In an effort to reduce congestion and emissions, Massport has a robust plan to manage RideApp operations and reduce RideApp deadhead activity. Massport's plan includes a rematch and shared ride program, RideApp fee structure changes to encourage shared rides and competition between modes, and optimization of RideApp operations on-Airport. Additional details can be found in Chapter 5, *Ground Access to and from Logan Airport*.	Massport consolidated RideApp activities on the ground floor of the Central and West Garages beginning in October 2019 and completed in December 2019. Massport implemented reduced ride fees for Shared Rides and authorized a rematch program in 2020. Additional pricing and policy changes continue to be evaluated as operational conditions evolve. Terminal B RideApp pick-up and drop-off operations from the ground floor of the Central Garage are in the process of being moved to the second floor of the Terminal B Garage. This will provide 60 spaces, including three Americans with Disabilities Act (ADA) accessible and four electric vehicle (EV) spaces. This new location is anticipated to open in November 2022.
4. Logan Express Route and Facility Expansion (Off-Airport)	
To maximize Logan Airport's off-campus traffic and infrastructure improvements, Massport continues to promote Logan Express ridership, thereby reducing vehicle miles traveled (VMT), congestion, and air quality emissions by shifting riders from other vehicle modes. Investments being considered for Logan Express include improving Back Bay Logan Express service, offering a new urban Logan Express service at North Station, pursuing new suburban Logan Express locations, increasing the frequency of the Braintree service, investing in existing suburban sites, and investing in structured parking at existing sites, among others. Additional details can be found in Chapter 5, *Ground Access to and from Logan Airport*.	Some initiatives to expand Logan Express routes and facilities commenced in 2018 and 2019 (e.g., studies to improve ridership, expansion of services, and evaluation of new suburban Logan Express locations). In response to the COVID-19 pandemic, in March 2020 many service reductions were implemented to better align with the severely reduced passenger levels. In 2021, several Logan Express service enhancements were restored in response to recovering airport activity levels. Woburn service was reopened and Braintree and Framingham service was increased to half-hourly service. In February 2022, Peabody services was reopened at a new more convenient location at the Northshore Mall. Back Bay service restarted in October 2022.

Source: Massport.
Notes: See **Figure 3-2** for the location of Airport parking projects/planning concepts.

Terminal Area Planning

The terminal area accommodates most of the passenger functions at Logan Airport, including the passenger terminals, terminal-area roadways, central parking facilities, and the Hilton Hotel. **Table 3-3** presents information on the status of each ongoing terminal area project. In addition, both Massport and its tenants are proposing projects or exploring planning concepts to modernize and carry out future improvements to the existing terminal facilities. The location of the ongoing terminal area projects and the planning concepts are shown on **Figure 3-3**.



Source: Massport.
Notes: Terminal E.

FIGURE 3-3 Location of Projects/Planning Concepts in the Terminal Area

2020/2021 Environmental Data Report

Notes: See Table 3-3 for a description of the numbered projects. Status as of September 30, 2022.

1. Terminal E Modernization
2a. Relocated Convenience and Filling Station (complete)
2b. Relocated Taxi Pool Lot
2c. Relocated RideApp Lot
3. Terminal B Optimization
4. Terminal C, Pier B Optimization (complete)
5. Terminal C Canopy, Connector, and Roadway Project
6. Terminal A to B Airside Connector

0 500 1000 2000 Feet

Table 3-3 Description and Status of Projects/Planning Concepts in the Terminal Area (September 30, 2022)

Description	Status
Massport Projects/Planning Concepts	
1. Terminal E Modernization (incorporates former West Concourse Project)	
The Terminal E Modernization Project will add the three gates approved in 1996 as part of the International Gateway West Concourse project (Executive Office of Energy and Environmental Affairs [EEA] # 9791), but never constructed, and add an additional four gates. The building will be aligned to function as a noise barrier. New passenger areas and passenger holdrooms are being planned, as well as possible additional Federal Inspection Services (FIS) and Customs and Border Protection (CBP) facilities to supplement the existing FIS areas in Terminal E. The Terminal E Modernization Project will occupy a portion of the North Cargo Area (NCA) and will include terminal gates, aircraft parking, hangars, and cargo facilities. The existing UPS cargo building will be relocated. Upon completion of this project and following a broader ground transportation strategy and planning process, a covered pedestrian connection between Terminal E and the Massachusetts Bay Transportation Authority (MBTA) Blue Line Airport Station will be constructed to improve passenger convenience. This connection is currently being studied and various approaches are under consideration.	An Environmental Notification Form (ENF) was filed with the EEA in October 2015. A joint draft federal Environmental Assessment (EA)/state Environmental Impact Report (EIR) was filed in July 2016 in accordance with the National Environmental Policy Act (NEPA) and the Massachusetts Environmental Policy Act (MEPA). Massport filed the Final EA/EIR on September 30, 2016. The Federal Aviation Administration (FAA) issued a Finding of No Significant Impact (FONSI) on November 10, 2016, and a Record of Decision (ROD) on the project on November 14, 2016, stating that Massport can update the Airport Layout Plan (ALP) with the Terminal E Modernization Project (copies of the Secretary's Certificates on the ENF, and Draft and Final EA/EIRs, are included in Appendix A, *MEPA Certificates and Responses to Comments).* Initial construction began in 2019. In June 2020, the construction program was adjusted in response to the COVID-19 pandemic and resulting passenger and revenue declines. Currently, Massport is proceeding with construction of the first four gates that will connect to the existing Terminal E with a mid-2023 anticipated completion. An update on a schedule to complete the remaining three gates and covered pedestrian connection to the Blue Line Airport Station will be provided in the *2022 Environmental Status and Planning Report (ESPR);* currently, Phase 2 of the project is deferred.
2. Convenience and Filling Station/Taxi Pool/RideApp Lot Relocations	
Construction of the Terminal E Modernization Project includes the relocation of the existing on-Airport gas station to the intersection of Tomahawk Drive and Jeffries Street on Massport property (Southwest Service Area [SWSA]). With input from the community-based Logan Impact Advisory Group, this location provides community benefits such as convenience stores, and landscaping and beautification enhancements. Another part of the design phase involved Massport further evaluating transportation and land-uses in this area in an effort to reduce vehicular congestion along Tomahawk Drive associated with the RideApp mode. The RideApp Pool Lot was relocated to the existing taxi pool at Porter Street to minimize Tomahawk Drive traffic and congestion. Similarly, the existing taxi pool lot was returned to the Blue Lot between the Logan Office Center and the Hyatt Hotel. By relocating the RideApp pool, greater operational flexibility and additional routing options are available that will allow Massport to reduce RideApp service impacts along Tomahawk Drive (shown as 2a, 2b, and 2c in **Figure 3 3**).	The replacement gas station was approved as part of the Terminal E Modernization Project's MEPA and NEPA review process described above. Construction was completed in 2019. Massport relocated both the RideApp Lot and Taxi Pool Lot in the fall of 2018. The project included traffic signal modifications along Harborside Drive.

Table 3-3 Description and Status of Projects/Planning Concepts in the Terminal Area (September 30, 2022) (Continued)

Description	Status
Massport Projects/Planning Concepts	
3. Terminal B Optimization Similar to the recent renovations and improvements at Terminal B, Pier A, Massport is upgrading its facilities on the Pier B side to meet airlines' needs (primarily reflecting the merger of American Airlines and US Airways) and to provide facilities that improve the passenger traveling experience. Improvements included an enlarged ticketing hall, improved outbound bag area, expanded baggage claim hall, expanded concession areas, and expanded holdroom capacity at the gates. The project consolidated American Airlines operations to one pier of the terminal (currently operating on two different sides of the terminal); all Terminal B Pier B gates are now connected post security. The project also consolidated checkpoint operations for better passenger throughput and an improved passenger experience.	Massport prepared a Draft EA in May 2017 and a Final EA in June 2017. On June 29, 2017, the FAA issued a FONSI. Work on Pier B is substantially complete, while work on Pier A was completed in the summer of 2019. Project construction completed in 2022.
4. Terminal C, Pier B Optimization This project will make improvements within the existing footprint of Terminal C, Pier B. Existing passenger areas will be renovated and a second level of less than 5,000 square feet will be added. A jet bridge will be installed at an existing aircraft parking position.	Project construction was completed in 2019.
5. Terminal C Canopy, Connector, and Roadway Project Massport is planning improvements that will enhance Terminal C facilities and provide a post-security connector between Terminals B and C, replace aging roadways serving the terminals, and improve the operation of the Terminal C curb. The enhancements also include replacement of the existing canopy on the Departures Level. The project will enhance Logan Airport's ability to efficiently accommodate current and future passenger volumes by bringing the terminal facilities up-to-date and improving access, egress, and drop-off/pick-up operations. Massport removed the "Old Tower" in summer of 2020 to accommodate the roadway and curb enhancements.	The FAA issued a FONSI in November 2018. Construction of the building enhancements and reconfigured roadway began in fall of 2019. In October 2020, the "Old Tower" removal was completed. Construction of the replacement canopy was completed in 2021, with a slightly reduced program than originally planned. The Terminal C to B Connector was completed in 2022 and roadways are anticipated to be complete in summer 2023.
6. Terminal A to B Airside Connector As part of the Airport-wide effort to enhance terminal connectivity post-security, a secure-side connector between Terminals A and B is under consideration.	The airside connector between Terminals A and B is still being considered, however, this project is not currently in the five-year Capital Program.

Source: Massport.
Notes: **See Figure 3-3** for the location of terminal area projects/planning concepts.

Airside Planning

The airside area includes all Logan Airport land from the edge of the terminal buildings to the Logan Airport harbor boundary, incorporating the Logan Airport apron, runways, gates, and other airfield operating facilities. Airside improvements include upgrades and improvements to the airfield to enhance the operational efficiency and safety of Logan Airport.

Nationally, FAA continues working to reduce potential airfield safety concerns. One current focus is reducing runway incursions, which occur when an aircraft, vehicle, or person enters an Airport's designated area for aircraft landings and take-offs. In 2019, in coordination with the FAA, Massport completed a comprehensive multi-year Runway Incursion Mitigation Study (RIM, or RIM Study) and Comprehensive Airfield Geometry Analysis to identify, prioritize, and develop strategies to help Massport mitigate incursion risk.[4] Massport identified and prioritized airfield locations where safety can be improved or that could be improved over the next 15 to 20 years, subject to federal, state, and local environmental reviews and permitting.

Massport is also currently exploring options to improve the layout and efficiency of the NSA by reorganizing the existing uses and enhancing safety within the RPZ. **Table 3-4** describes the status of these and other projects (as shown on **Figure 3-4**) and planning concepts under consideration for Logan Airport's airside area as of the end of September 2022, and provides additional updates as available.

4 Information on FAA's RIM program can be found at https://www.faa.gov/airports/special_programs/rim/.

FIGURE 3-4 Location of Projects/Planning Concepts on the Airside

2020/2021 Environmental Data Report

Notes: See Table 3-4 for a description of the numbered projects. Status as of September 30, 2022.

1. Runway 9-27 RSA Improvement
2. Runway 15L-33R RSA Rehabilitation Project (complete)
3. Runway Incursion Mitigation Study and Comprehensive Airfield Geometry Analysis (complete)

0 500 1000 2000 Feet

Table 3-4 Description and Status of Projects/Planning Concepts on the Airside (September 30, 2022)

Description	Status
1. Runway 9-27 RSA Improvement Project	
As part of the Runway Incursion Mitigation (RIM) Study, runway safety areas (RSAs) at Logan Airport were analyzed for conformance with Federal Aviation Administration (FAA) standards. The FAA requires RSAs to accommodate aircraft overruns, undershoots, and veer-offs in emergency situations. Consistent with FAA requirements, Massport is continuously looking for opportunities to increase the margin of safety for all runways and, where practicable, providing the FAA standard for RSAs at all locations. At Logan Airport, the FAA standard for RSAs is typically 500-feet-wide by 1,000-feet-long at each runway end. Where this space is not available, FAA has approved the use of an Engineered Materials Arresting System (EMAS) for aircraft overrun protection. An EMAS uses a system of collapsible concrete blocks that can stop an aircraft by exerting predictable forces on the landing gear while minimizing aircraft damage. The RIM Study evaluated multiple alternatives for Runway 9-27 RSA enhancements and recommended construction of a deck, with an EMAS to meet the FAA safety requirements. The RSA at the end of Runway 27 is expected to be similar to the pile-supported deck installed at Runway 33L.	The FAA issued a determination that approved the recommended alternative as it met applicable FAA safety requirements while minimizing environmental impacts. Initial concept design and preliminary environmental review and permitting commenced in late 2019. Environmental data collection and field studies commenced in Spring 2020 including marine borings. In August 2021, an Environmental Notification Form (ENF) was filed with the Massachusetts Environmental Policy Act (MEPA) Office. The Draft Environmental Impact Report (EIR) was filed in June 2022. Work on the Final EIR and National Environmental Policy Act (NEPA) document is underway.
2. Runway 15-33 Rehabilitation Project	
Pavement inspections and sampling indicates that Runway 15R-33L is in need of rehabilitation, which was last performed in 2012. Massport plans to rehabilitate Runway 15R-33L, including pavement at the intersections with Runways 4L-22R and 4R-22L, and intersecting taxiways. The project also includes taxiway pavement geometry modifications at or near Runway 15R-33L in accordance with the latest FAA standards, and the RIM Study and Comprehensive Airfield Geometry Analysis (described below). Associated runway and taxiway lighting, pavement markings, and pavement sensors would be upgraded and/or replaced as part of the project.	Massport began design for the proposed Runway 15R-33L rehabilitation and associated improvements in 2022, which is ongoing at the time of this Environmental Data Report (EDR). In accordance with FAA requirements, Massport is preparing NEPA documentation for the proposed project and will coordinate with applicable federal, state, and local agencies as part of NEPA review and the appropriate permitting processes. Pending project review and approval, construction is estimated to start in the spring of 2023 and be completed by the end of the year.
3. RIM Study and Comprehensive Airfield Geometry Analysis	
FAA recently initiated a nationwide comprehensive multi-year RIM program to identify, prioritize, and develop strategies to help airport sponsors mitigate risk. Runway incursions occur when an aircraft, vehicle, or person enters the Airport's designated area for aircraft landings and take-offs.[1] Risk factors may include unclear taxiway markings, airport signage, and more complex issues such as runway or taxiway layout.	Massport has worked with FAA to identify areas that need to be addressed and plan for the implementation of safety measures. The study commenced in December 2016 and was completed in June 2019.

Source: Massport.

Notes: See **Figure 3-4** for the location of airside projects/planning concepts.

1 Information on FAA's RIM program can be found at https://www.faa.gov/airports/special_programs/rim/.

Service Area Planning

Logan Airport's service areas contain airline support businesses and operations. Land use in the service areas continue to evolve in response to changing airline business, customer and tenant needs, as well as public works projects. Massport continues to explore ways of efficiently using the limited land resources in the service areas. The six service areas at Logan Airport are shown in **Figure 3-5** and are described below.

- **North Cargo Area (NCA)** is in Logan Airport's northwest corner. It is bounded by the main Logan Airport outbound roadway to the south, Route 1A to the west, Prescott Street to the north, and Terminal E to the east. The NCA, which is adjacent to Logan Airport's airside area, is the Airport's primary airline support area. It accommodates essential airline support businesses including hangars, GSE maintenance, air cargo, and aircraft parking. The NCA will remain the most appropriate location for operations that require contiguous airside access. The Terminal E Modernization Project will eventually occupy a portion of the NCA and will include terminal gates, aircraft parking, hangars, and cargo facilities. Portions of the NCA will continue to be used for economy parking. Expansion of the Economy Garage, as part of the Logan Airport Parking Project, has completed the permitting process; the construction of the Economy Garage expansion is deferred.
- **North Service Area (NSA)** is north of Prescott Street and extends to the Green Bus Depot Site, the MBTA Wood Island Station, and Runway End 15R. The NSA includes two flight kitchens, weather and navigation equipment, the Green Bus Depot, Facilities 2 and 3, the Large Vehicle Storage Facility, Hangar 5, BOSFuel Fuel Farm, water tanks, Signature Flight Support (a fixed-based operator), and Logan Airport Greenway, among others. The Greenway Connector and Narrow-Gauge Connector both run parallel to the MBTA Blue Line corridor in this section of the Airport. Massport is currently exploring options to improve the layout and efficiency of the NSA by reorganizing the existing uses which would expand Remain Over Night (RON) aircraft parking, remove an unused building in the RPZ, and improve overall land use. This project is expected to require review under NEPA. Massport has issued a RFI and is in the process of evaluating a replacement of the current FBO facility located in the NSA.

  Also within the NSA, Massport is constructing an additional jet fuel storage facility on the site of an abandoned Massport water pumping station, located on Prescott Street adjacent to the Economy Garage. Construction is expected to be completed in 2024.
- **Southwest Service Area (SWSA)** is south of Logan Airport's main access roadway and is bounded on the east by Harborside Drive. Because of its proximity to the terminals and the regional highway system, the SWSA functions as Logan Airport's primary ground transportation hub and includes the Rental Car Center (RCC), and the taxi, RideApp, and bus/limousine pools. The RCC reduces Airport VMT and improves roadway and intersection operations through consolidation of the rental car shuttle bus fleet and some Massport shuttle buses into a unified shuttle route system, resulting in the elimination of eight rental car shuttle bus fleets (a net total of 66 buses eliminated); improvement of intersection and roadway infrastructure, including signal coordination and dedicated ramp connections; and establishment of a Ground Transportation Operations Center (GTOC), enabling efficient planning and operation of Airport-wide transit activities. As part of the Terminal E Modernization Project, the existing on-Airport gas station was relocated to the SWSA in 2019, and combined with a community convenience store/market.

- **Bird Island Flats (BIF)** is located south of the Logan Airport SWSA. BIF has landside access via Harborside Drive and water access through the system of water taxis that shuttle passengers between downtown Boston, the South Shore, and Logan Airport. BIF development includes the Hyatt Hotel and Conference Center, the Logan Office Center and adjoining garage, an employee parking lot (Lot B), the Logan Taxi Pool, the Water Shuttle Dock, the Logan Airport Rescue and Fire Fighting Facility Marine Dock, and the Harborwalk, a publicly accessible promenade along the harbor's edge.
- **South Cargo Area (SCA)** is located southeast of the Logan Airport SWSA and is generally bounded on the south by Harborside Drive and on the east and north by Logan Airport's airside area. The SCA, which provides landside access and secured airside access, is Logan Airport's primary cargo area and accommodates domestic and international cargo operations.
- **Governors Island** is at Logan Airport's southern tip and is bounded by Runway 14-32 and Boston Harbor to the east and south, by Runway 4R to the west, and Runway 9 to the north. Governors Island has functioned as a storage site for the Central Artery/Tunnel (CA/T) Project and for construction stockpiles. The area also contains an Aircraft Rescue and Fire Fighting Facility training area, parking for snow removal equipment, a biocell remediation area, and FAA aircraft navigation equipment. The area has been considered as a future location of RON aircraft parking, and potentially other uses (including cold storage).

Table 3-5 presents information on the status of each ongoing project and planning concept in the service areas. Both Massport and Logan Airport tenants are proposing projects or exploring planning concepts to modernize and carry out future improvements to the service areas. The locations of the ongoing service area projects and planning concepts that may potentially be constructed in the future are shown on **Figure 3-6**.

FIGURE 3-5 Logan Airport Service Areas

2020/2021 Environmental Data Report

Service Areas

0 500 1000 2000 Feet

FIGURE 3-6 Location of Projects/Planning Concepts in the Service Areas

2020/2021 Environmental Data Report

Notes: See Table 3-5 for a description of the numbered projects. Status as of September 30, 2022.

1. Logan Airport RPZ Enhancements ESMF Relocation
2. Jet Fuel Storage Addition - NSA
3. Governors Island Equipment Storage

Locations To Be Determined

4. Relocated CNG Station - NCA
5. Cargo Through-put Facility
6. Replacement Cargo Facilities - NCA
7. Joint Operations Center

0 500 1000 2000 Feet

Table 3-5 Description and Status of Projects/Planning Concepts in the Service Areas (September 30, 2022)

Description	Status
Massport Projects/Planning Concepts	
1. Logan Airport Runway Protection Zone (RPZ) Enhancements Equipment Storage and Maintenance Facility (ESMF) Relocation Massport is evaluating safety enhancements in the RPZ at the approach end of Runway 15R. This area includes hangars, aircraft parking, the North Gate, aircraft fueling facilities, and other airfield maintenance support facilities.	Massport is working with the Federal Aviation Administration (FAA) to study the feasibility of implementing RPZ enhancements including reorganization of buildings and uses in this area.
2. Jet Fuel Storage Addition – North Service Area (NSA) Massport proposes to enhance the reliability of jet fuel storage availability and distribution to meet current demand at Logan Airport by installing additional jet fuel storage facilities within the existing storage and distribution system. The proposed location for these additional facilities is the site of an abandoned Massport water pumping station, located on Prescott Street adjacent to the rear of the Economy Garage. The functions, facilities, and land use in the project area will remain generally consistent.	Construction of a fifth jet fuel storage tank immediately adjacent to the existing tanks and fuel distribution facilities began in 2022 with an expected 2024 completion date.
3. Governors Island Equipment Storage Governors Island has been identified for a number of aviation support activities for many years. The area has been considered as a future location of remain over night (RON) aircraft parking, and potentially other uses (including cold storage).	Massport continues to evaluate concepts for Governors Island.
4. Relocated Compressed Natural Gas (CNG) Station in the North Cargo Area (NCA) (location to be determined) This would relocate Massport's existing CNG Station to accommodate the airside operations in the NCA.	Massport continues to examine potential on-Airport parcels for relocation of the existing CNG station. Relocation is not expected to occur before 2023.
5. Cargo Through-put Facility Massport is considering the option of constructing a cargo through-put facility to improve cargo processing, by facilitating transfer of goods from aircraft to transfer points for future distribution.	This project is currently in the feasibility and planning stage.
Tenant Projects/Planning Concepts	
6. Replacement Cargo Facilities in the NCA (location to be determined) Construction of new cargo facilities in the NCA would compensate for the loss of cargo facilities due to the Central Artery/Tunnel (CA/T) Project, as well as for the projected growth in cargo demand.	The project remains under evaluation. If a decision were made to proceed with this project, construction would likely commence after 2025.

Table 3-5 Description and Status of Projects/Planning Concepts in the Service Areas (September 30, 2022) (Continued)

Description	Status
Tenant Projects/Planning Concepts (Continued)	
7. Joint Operations Center (JOC) (location to be determined)	
The JOC is envisioned as a state-of-the-art operations and situational awareness center. The goal of the JOC is to capture the security and response benefits afforded through integrated incident dispatch and mobile response for public safety and security services. The program plans to bring the Operations Center, State Police Dispatch, Maritime Monitoring (with future Hanscom Field and Worcester Regional Airport monitoring), and Transportation Security Administration (TSA) staff, within the structure of one common facility.	Development of a common command and control JOC is in the feasibility phase.

Source: Massport.
Note: See **Figure 3-6** for the location of service area projects/planning concepts.

Airport Buffer Areas and Open Space Planning

Previously, Massport committed over $15 million for the planning, construction, and maintenance of four Airport edge buffer areas and two parks along Logan Airport's perimeter (**Figure 3-7**). These buffers have been completed and include the Bayswater Embankment Airport Edge Buffer, Navy Fuel Pier Airport Edge Buffer, SWSA Airport Edge Buffer, and Neptune Road Airport Edge Buffer. These areas are located on Massport-owned property along Logan Airport's perimeter boundary and provide attractive landscape buffers between Airport operations and adjacent East Boston neighborhoods. The buffer design included consultation with Logan Airport's neighbors and other interested parties in an open community planning process. Today, East Boston enjoys 3.3 miles and more than 33 acres of green space developed or managed by Massport, in partnership with and in response to the East Boston community.

In September 2016, Massport officially opened the Bremen Street Dog Park. The park, the first of its kind in East Boston, provides 22,655 square feet of play space for neighborhood dogs. Other park amenities include exercise equipment for dogs, pet waste stations, and water fountains for both pets and their owners. Massport completed the construction of the Greenway Connector between Bremen Street Park and an overlook at Wood Island Marsh in March 2014. The one-half mile Greenway Connector connects the pedestrian/bicycle path to the City of Boston/Narrow-Gauge Connector to Constitution Beach. In 2016, construction on the Narrow-Gauge Connector was underway by the City of Boston. The Narrow-Gauge Connector is a one-third-mile multi-use path and extension of the East Boston Greenway network which allows pedestrians and cyclists to travel between Piers Park and Constitution Beach. Massport assumed ownership and operation of the Narrow-Gauge Connector when it was completed in 2016.

As part of the Logan Impact Advisory Group (LIAG), Massport committed to developing Piers Park II, which will add approximately 4.2 acres of green space to the East Boston waterfront upon completion. The conceptual design of the Phase II site envisions a fully accessible park with a central lawn area, basketball and volleyball courts, and bicycle and rollerblade tracks. A Request for Proposals (RFP) for design of Piers Park Phase II was

issued by Massport in June 2017. Construction for Piers Park II commenced in October 2022 and is scheduled to be complete by the end of 2023.

Piers Park Phase III is conceived as a 3.8-acre addition of green space to the existing Piers Park on the East Boston waterfront. The Phase III site is located adjacent to the Phase II site, along Marginal Street in East Boston. Piers Park Phase III is an early-stage planning concept that Massport has made available to external developers. Piers Park Phase III would turn an aging pier into a 3.6-acre greenspace that includes resiliency features to help protect the neighborhood from flooding and sea level rise. Massport issued a RFP in February 2018 for design and construction of Piers Park Phase III. In 2020, The Trustees of Reservations were selected to advance planning and permitting for this facility. Initial site feasibility studies are underway, as is stakeholder outreach.

Figure 3-7 Parks Operated by Massport and City of Boston

Source: Massport, VHB.

To collaborate in East Boston open space planning, Massport also participates in meetings with other agencies including the Massachusetts Department of Transportation (MassDOT), the City of Boston, and the MBTA. **Table 3-6** describes the status of ongoing buffer projects and other Massport green space projects under consideration as of 2022. **Figure 3-8** shows the location of these buffer projects.

FIGURE 3-8 Location of Airport Buffer Projects/Open Space

2020/2021 Environmental Data Report

Notes: See Table 3-6 for a description of the numbered projects. Status as of September 30, 2022.

1. SWSA Airport Edge Buffer (Phases I and II) (complete)
2. Neptune Road Airport Edge Buffer (complete)
3. Navy Fuel Pier Airport Edge Buffer (complete)
4. Bayswater Embankment Airport Edge Buffer (complete)
5. Bremen Street Park and Dog Park (complete)
6. Greenway Connector (complete)
7. Community Greenway Enhancements (complete)
8. Narrow-Gauge Connector (complete)
9. Piers Park Phase I (complete)
10. Piers Park Phase II
11. Piers Park Phase III (by others)

0 500 1000 2000 Feet

Table 3-6 Description and Status of Airport Edge Buffer Projects/Open Space (September 30, 2022)

Description	Status
1. Southwest Service Area (SWSA) Airport Edge Buffer (Phases I and II)	
Phase I involved the construction of an approximately half-acre area with landscaping and lighting improvements along Maverick Street that included evergreen and deciduous trees, ornamental shrubs, and groundcovers.	Phase I construction was completed in 2006.
Phase II consisted of landscaping (i.e., densely planted or planted atop earth berms for enhanced separation) and solid barriers such as fences and walls. The project enhanced bicycle and pedestrian connectivity between Maverick Street and East Boston Memorial Park and Stadium with extensive landscaping including trees, shrubs, flowering perennials, and decorative fences.	Phase II of the SWSA Airport Edge Buffer design was integrated with the SWSA Redevelopment Program and was completed in Fall 2014.
2. Neptune Road Airport Edge Buffer	
The Neptune Road Airport Edge Buffer is a Massport community mitigation project to buffer the East Boston Neighborhood at Logan Airport's northwestern edge. The 1.5-acre parcel is at the nexus of Neptune Road, Vienna, and Frankfort Streets and is adjacent to the Massachusetts Bay Transportation Authority's (MBTA) Wood Island Station. The majority of the parcel is located within the Runway 15R-33L Runway Protection Zone (RPZ) which limits the type of active uses in this area. The project consists of Olmsted-inspired landscape with interpretive elements that complement the adjacent North Service Area Roadway Corridor and serves as a continuation of the pedestrian/bicycle path to Bennington Street.	The Neptune Road Airport Edge Buffer was completed in June 2016.
3. Navy Fuel Pier Airport Edge Buffer	
The Navy Fuel Pier Airport Edge Buffer project began with the U.S. Army Corps of Engineers' remediation of the former Navy Fuel Pier, which was completed in 2001. The project involved beautification of this 0.7-acre property through landscape improvements and stabilization of the waterfront perimeter. An interpretive panel was also installed which details the history of the surrounding area.	Construction of the Navy Fuel Pier Airport Edge Buffer was completed in 2007.
4. Bayswater Embankment Airport Edge Buffer	
This project involved creating a landscaped buffer between Bayswater Street and Boston Harbor.	Construction of this Airport edge buffer was completed in 2003. Massport is evaluating options for repairing recent storm-related shoreline damage.
5. Bremen Street Park and Dog Park	
The 18-acre park was constructed as part of the Central Artery/Tunnel (CA/T) Project. The park, which is the second largest neighborhood park in East Boston, offers a variety of facilities, a direct pedestrian connection to the MBTA Blue Line Airport Station, and a half-mile segment of the 3-mile East Boston Greenway. The park was built on land previously used as a rail yard and later off-Airport parking. a nearly half-acre dog park is located on the corner of Bremen and Porter Streets.	Construction of the park was completed in 2008. Massport continues to operate the park and provide community facilities. The Dog Park was opened in September 2016.
6. Greenway Connector	
The one-half mile pedestrian/bicycle path connects the Bremen Street Park pedestrian/bicycle path to the Narrow-Gauge Connector. Together the Greenway and Narrow-Gauge Connectors provide a continuous path connecting Piers Park, Bremen Street Park, Stadium Park, and Constitution Beach.	Construction of the Greenway Connector between Bremen Street Park and an Overlook at Wood Island Marsh was completed by Massport in 2014.

Table 3-6 Description and Status of Airport Edge Buffer Projects/Open Space (September 30, 2022) (Continued)

Description	Status
7. Community Greenway Enhancements	
Eight street lights were installed along Saratoga Street to improve safety and maintain spacing consistent with what was existing.	The lighting improvements were completed in December 2015.
8. Narrow-Gauge Connector	
The Narrow-Gauge Connector is a one-third-mile multi-use path and extension of the East Boston Greenway network. This portion of the East Boston Greenway allows people to continuously walk from Piers Park to Constitution Beach.	Construction by the City of Boston was started in 2015 and the Narrow-Gauge Connector was opened in May 2016. The City of Boston completed final plantings in Spring of 2016 and turned the project over to Massport for ownership and continuing maintenance, and security.
9. Piers Park Phase I	
Formerly a 7-acre industrial site located on the East Boston waterfront, the Phase I site is comprised of three distinct zones: 5.5-acre backland, 1.2-acre pier, and a community sailing facility. The park includes a picnic area, adult fitness course, children's playground and spray park, and an outdoor amphitheater.	Construction was completed in 1995.
10. Piers Park Phase II	
Piers Park Phase II will add 4.2 acres of green space to the existing Piers Park on the East Boston waterfront. The Phase II site is located adjacent to the Phase I site, along Marginal Street. The conceptual design of the Phase II site envisions a fully accessible park with a central lawn area, basketball and volleyball courts, and bicycle and rollerblade tracks. Massport has committed up to $15 million for the design and construction. This new park is expected to offer resiliency landscape features similar to those in the Phase I Park, including brick paved walkways, site furniture, lighting, and plantings. Elevation of the site is also planned to improve neighborhood resiliency and flood damage protection. A new 1,000-square foot community/sailing center, located on the waterfront, is designed to replace the existing Sailing Center building while providing additional meeting spaces for the community.	Massport issued a Request for Proposals for design of Piers Park Phase II in June 2017. The concept planning and permitting phase was completed in 2022. Construction for Piers Park II commenced in October 2022 and is scheduled to be complete by the end of 2023.
11. Piers Park Phase III (*by others*)	
Piers Park Phase III is conceived as a 3.8-acre addition of greenspace to the existing Piers Park on the East Boston waterfront. The site is located adjacent to the Phase II site, along Marginal Street in East Boston. Piers Park Phase III would turn an aging pier into a 3.6-acre greenspace that includes resiliency features to help protect the neighborhood from flooding and sea level rise.	Massport issued a Request for Proposals in February 2018 for design and construction of Piers Park Phase III. In 2020, The Trustees of Reservations was designated by Massport a developer of the park. Initial site feasibility studies and stakeholder outreach commenced in 2020 and overall planning is underway. Concept design and permitting is expected to take several years. In November 2022, a public meeting was held to present the latest concept design.

Source: Massport.
Note: See **Figure 3-8** for the location of Airport edge buffer projects/planning concepts.

Net Zero and Resiliency Planning

In 2022, Massport released its *Roadmap to Net Zero by 2031*, an Authority-wide emissions reduction strategy, the goal of which is to strive to reach net zero GHG emissions by 2031 under its direct control, by Massport's 75th anniversary. The *2022 ESPR* will report on the implementation of that program, which is summarized in the Sustainability and Resiliency Program section below. Key pathways to Net Zero include building energy efficiency, transitioning to EVs, phased procurement of a sustainable energy supply, and a range of measure to help enable emissions reduction by our tenants and business partners. Additional information can be found at https://www.massport.com/massport/about-massport/roadmap-to-net-zero/.

As part of an authority-wide initiative to support this emission reduction goal and resiliency efforts, Massport recently completed or is undertaking several airport-wide energy, resiliency, and sustainability planning efforts that support the goals of the *Net Zero Roadmap by 2031*.

Energy Planning

Massport has a long-standing energy management program committed to supply side wholesale energy management and procurement and demand side energy efficiency and renewable energy development. Supply side wholesale purchasing is managed through an inter-departmental advisory group consisting of representatives of Administration and Finance, Building Operations, and Capital Programs and Environmental Affairs. Procurement is guided by a Board approved Energy Hedge Policy. Demand management is pursued through individual capital projects and stand-alone measures, where feasible, including investments in high efficiency lighting, automated building energy management systems, and microgrids. Renewable energy planning has taken the form of a Massport-wide evaluation of feasible third-party financed renewable energy development sites designed for coordination with the Commonwealth of Massachusetts Solar Massachusetts Renewable Target Program (SMART). As part of this evaluation, all Massport properties were vetted for potential solar development. A single solar project resulted from this analysis, the Worcester Regional Airport project, which has subsequently been advertised and awarded. Project development of the Worcester project will continue under a public/private partnership.

Massport will continue to evaluate renewable energy development potential across all of its properties. Massport has numerous existing self-financed solar panel installations at Logan Airport and Hanscom Field, including locations on top of the Economy Garage, Rental Car Center, Terminal A, Hanscom Civil Air Terminal, and Terminal B Garage. Solar development continues to be integrated into new construction projects including the Terminal E Modernization Project which includes a planned 300,000-kilowatt hour (kWh) rooftop solar array in the second phase of the project. The Terminal C Canopy project is planned to include a rooftop solar array. In addition, Massport will install solar panels at the planned new Terminal E parking garage when that project proceeds. Previously, Massport formed a public/private partnership to develop its largest existing solar installation, 357kW, on the roof of Terminal A and Terminal A Satellite. This project was undertaken as part of a statewide solicitation designed to facilitate American Recovery and Reinvestment Act (ARRA) grant funding development of solar energy in the Commonwealth of Massachusetts.

In 2018, the EPA awarded a $541,817 grant to Massport to replace diesel powered GSE at Logan Airport. This grant will be used in conjunction with an FAA VALE grant Massport received in the fall of 2018, to install eGSE

charging stations as part of the Terminal B Optimization Project. On the landside, Massport has installed electric charging facilities in all its garages and will also install them in the proposed new garage in front of Terminal E and the expanded Economy Garage when those projects proceed.

Resiliency Planning

Massport has a robust effort underway that first identified coastal storm and climate change vulnerabilities on the Airport and has incorporated resilient infrastructure design standards for all types of Airport projects. At the end of 2013, Massport initiated a Disaster and Infrastructure Resiliency Planning Study (DIRP) for Logan Airport, the Port of Boston, and Massport's waterfront assets in South and East Boston. The DIRP Study includes a hazard analysis, models of sea-level rise and storm surge, and projections of temperature, precipitation, and anticipated increases in extreme weather events. The DIRP Study provides recommendations regarding short-term strategies to make Massport's facilities more resilient to the likely effects of climate change. The study was completed and implementation of adaptation initiatives began in late 2014.

In addition to the DIRP Study and its related initiatives, Massport has completed an Authority-wide risk assessment, as part of its strategic planning initiative; issued a Floodproofing Design Guide; and has developed a resilience framework to provide consistent metrics for short- and long-term planning and protection of its critical facilities and infrastructure. Beyond infrastructure resiliency, Massport is also focused on incorporating social and economic resilience into its long-term operational and capital planning. Massport's Floodproofing Design Guide was published in November 2014, and updated in November 2018.

Operational aspects of resiliency strategy include the development of Flood Operations Plans for Logan Airport and Massport maritime facilities. These plans were introduced in 2014 and included the planned deployment of temporary flood barriers to protect up to 12 locations of critical infrastructure in the event of severe weather. The test deployments and live event staging for the March 2018 Nor'easters succeeded in managing and tracking flood barrier deployment logistics and effective communication. As a result, Logan Airport's Flood Operations Plans and operational responses have evolved. A web-based coastal flood resiliency application was developed to better manage planning immediately prior to an event impact, and to facilitate operational response and recovery as quickly as possible.

Additional locations have been permanently enhanced to prevent flooding. The flood operations plans are evaluated annually to enhance their effectiveness and to adapt to evolving requirements and past experiences. As reported in the Massport *2019 Annual Sustainability and Resiliency Report*, 100 percent of critical assets such as electrical power facilities, diesel fuel pumping stations, telecommunications systems, and police and fire public safety buildings have been enhanced with resiliency measures. Floodproofing measures include: installing temporary flood barriers for facilities, raising electrical and mechanical equipment above forecasted flood levels, sealing and waterproofing openings and conduits, installing water sensors and pumps, and installing anchoring systems for the deployment of temporary flood fencing and flood barriers in the event of an emergency.

In 2017, Massport conducted a series of workshops with key stakeholders to review and continuously improve its Flood Operations Plans. In addition, many education and training opportunities have been provided to staff and emergency responders to increase operational preparedness for flood events. In March 2018, Massport conducted several test deployments of flood barriers at three critical Logan Airport assets. Between 2020 and

2021, Massport conducted a tabletop exercise for Aviation and Maritime in preparation for extreme storm events such as hurricanes. Additionally, Massport developed a flood resiliency application to inform decision-making, facilitate management oversight, and enable real-time field updates via mobile devices before, during, and after storm events.

Logan Airport Sustainability Planning

In 2013, Massport was awarded a grant by FAA to prepare a Sustainability Management Plan (SMP) for Logan Airport. The Logan Airport SMP planning effort began in May 2013 and was completed in April 2015. The purpose of the Logan Airport SMP is to enhance the efficiency and sustainability of Logan Airport's operations and to support the broader sustainability principles of the Commonwealth. The Logan Airport SMP takes a comprehensive approach to sustainability including economic vitality, social responsibility, operational efficiency, and natural resource conservation considerations. The Logan Airport SMP is intended to promote, integrate, and coordinate sustainability efforts across the Authority. The Logan Airport SMP was developed with a framework and implementation plan, with metrics and targets designed to track progress over time. Massport is currently advancing a series of short-term initiatives to help reach its goals in the areas of energy and GHG emissions; community, employee, and passenger well-being; resiliency; materials, waste management, and recycling; and water conservation.

Massport Annual Sustainability and Resiliency Report

The Massport *Annual Sustainability and Resiliency Report* provides a progress summary of sustainability efforts at Logan Airport and other Massport facilities, based on Massport's sustainability goals and targets established in the Logan Airport SMP. The first report, titled the *Logan Airport Annual Sustainability Report*, was published in April 2016 and focused on Logan Airport only. Since the publication of the first report, Massport has continued expanding its sustainability initiatives, with an increased focus on implementing resiliency measures to protect Maritime and Logan Airport operations, critical infrastructure, and workforce. The lastest *Annual Sustainability and Resiliency Report* highlights Massport's progress towards improving sustainability and enhancing resiliency at its facilities and is available on Massport's website at: http://massport.com/massport/business/capital-improvements/sustainability/sustainability-management/. A new report is anticipated to be released in 2022.

Annual Sustainable Massport Calendar

Beginning in 2015, Massport distributed *Sustainable Massport* calendars to employees and other stakeholders. The calendars are filled with examples of Massport's sustainability projects and successes, and each month highlights aspects of environmental, social, and economic aspects of sustainability to which employees can contribute.

Source: Massport.

Sustainability Updates

Massport is continuing to incorporate sustainability considerations into its projects and is currently advancing a series of initiatives to help reach its goals. Each year since the publication of the Logan Airport SMP, Massport has continued to widen the lens of its sustainability and resiliency goals to incorporate its other aviation and maratime facilities. Massport reports its progress towards achieving each goal, including changes in related performance, in sustainability reports. Updates will be reported in future *Annual Sustainability and Resiliency Reports*. The next report is anticipated to be released in late 2022.

4

Regional Transportation

During the 2020/2021 period, Boston Logan International Airport (Logan Airport or the Airport) and the aviation industry in general, continued its gradual recovery after having experienced strong growth over the previous few years prior to the COVID-19 pandemic. The impacts of the COVID-19 pandemic, which began to be felt in mid-March 2020, led to dramatic reductions in passenger levels and flights at Logan Airport as well as the other regional airports. Logan Airport continued to be one of the nation's airports experiencing a lag in passenger recovery by the end of 2021, compared to other large hub U.S. airports and among the New England regional airports.

The regional airports including Manchester-Boston Regional Airport in Manchester, New Hampshire and Rhode Island T.F. Green International Airport in Warwick, Rhode Island also experienced significant drops in passenger activity of over 95 percent at the height of the pandemic in April 2020. These airports have recovered at slightly better rates than Logan Airport since they are less dependent on international and business travel. Overall, the aviation industry has been gradually recovering to its pre-pandemic levels (2019 levels) given the easing of lockdown restrictions by local, state, and national authorities, which enabled businesses to re-open, increased economic production outputs, and based on pent-up demand for air travel. In addition, the widespread distribution of the COVID-19 vaccines and booster shots worldwide has reduced the strain on healthcare facility capacities and restored passenger confidence to fly.

Key Findings for 2020 and 2021

- In 2020, air passenger activity in the New England region declined significantly with some recovery in 2021. By year-end 2021, regional air passengers have recovered to about 56 percent of 2019 levels. Prior to the pandemic, nearly 60 million air passengers flew through the New England system in 2019, a historic high. The 10 regional airports (excluding Logan Airport) in New England accommodated approximately 6 and 11 million air passengers in 2020 and 2021, respectively, compared to approximately 17.2 million passengers in 2019. Between 2020 and 2021, the regional airports accommodated nearly 32 percent of total air passengers in New England, with the remaining 68 percent (12.6 million and 22.7 million air passengers in 2020 and 2021, respectively) flying through Logan Airport, as discussed in Chapter 2, *Activity Levels*.

- In 2021, Bradley International, Rhode Island T.F. Green International, Portland International Jetport, Bangor International, Manchester-Boston Regional, Worcester Regional, and Hanscom Field recovered between approximately 80 to 100 percent of their 2019 total aircraft operations. Whereas, Tweed-New Haven, Burlington International, and Portsmouth International airports exceeded 2019 operation levels, fueled in part by charter and general aviation (GA) activity growth. Commercial passenger service recovery continues to lag at all regional airports, however, several airports welcomed new entrant services in 2020 and 2021 offered by low-cost and ultra-low-cost carriers such as Allegiant Air, Avelo Airlines, Breeze Airways, Frontier Airlines, and Sun Country Airlines.

- According to the latest statewide airport economic impact study from 2019, Massport's three airports, Logan Airport, Worcester Regional Airport, and Hanscom Field, made significant contributions to the regional economy, generating approximately $23.1 billion annually, or 94 percent of the overall economic benefits generated by the Massachusetts airport system.

- Passenger numbers at Worcester Regional Airport declined by approximately 78 percent in 2020 compared to 2019, followed by further decline in 2021 when all commercial traffic was temporarily suspended (resumed in late in 2021). Altogether, Worcester Regional Airport has reported a total of nearly 890,000 cumulative passengers since 2013 when it re-introduced commercial services. jetBlue Airways, American Airlines, and Delta Air Lines have resumed nonstop flights to the majority of its pre-pandemic served destinations as of the end of 2021.

- Hanscom Field, a GA reliever airport to Logan Airport, remained the second busiest airport in New England in 2020 and 2021 (after Logan Airport) in terms of aircraft operations, driven by the GA demand.

- Amtrak rail system-wide ridership decreased from 16.8 million customer trips in fiscal year (FY) 2020 to 12.2 million trips in FY 2021. In FY 2020, the Northeast Corridor (NEC) carried approximately 6.1 million passengers, down approximately 51 percent from the prior year. In FY 2021, the NEC carried 4.4 million passengers on those services, down about 28 percent from the prior year.

Introduction

Logan Airport plays an important role in the New England region's intermodal transportation system. This chapter reports on the status of the region's airports and other intermodal facilities in 2020 and 2021, and activity recovery relative to 2019 levels, a pre-pandemic period.

Logan Airport is the centerpiece of the three airports owned and operated by Massport. It is the primary international and domestic airport operating within the network of New England regional airports.[1] Massport also owns and operates Worcester Regional Airport and Hanscom Field; both of which play important roles in the New England regional transportation system, as described below. This chapter focuses on 2020 and 2021 and describes passenger and aircraft operations activity levels at New England regional airports,[2] including consideration of:

- Changes in airline service levels and other factors that have contributed to trends in regional airport activity over the course of the pandemic;
- The status of current improvement plans and projects at the regional airports;
- Massport's initiatives and joint efforts with other transportation agencies to improve the efficiency of the New England regional transportation system; and
- Regional long-range transportation planning efforts.

New England Regional Airports

As shown in **Figure 4-1**, the New England region is anchored by Logan Airport and a system of 10 other commercial service, reliever, and general aviation (GA) airports (regional airports).[3] Together, these 11 airports accommodated 18.5 million passengers in 2020 and 33.6 million passengers in 2021, which represent more than 98 percent[4] of New England's air travel demand. These airports include:

- Logan Airport (BOS)
- Worcester Regional Airport (ORH)
- Hanscom Field (BED)
- Bradley International Airport (BDL)
- Rhode Island T.F. Green International Airport (PVD)
- Manchester-Boston Regional Airport (MHT)
- Portland International Jetport (PWM)
- Burlington International Airport (BTV)
- Bangor International Airport (BGR)
- Tweed-New Haven Airport (HVN)
- Portsmouth International Airport (PSM)

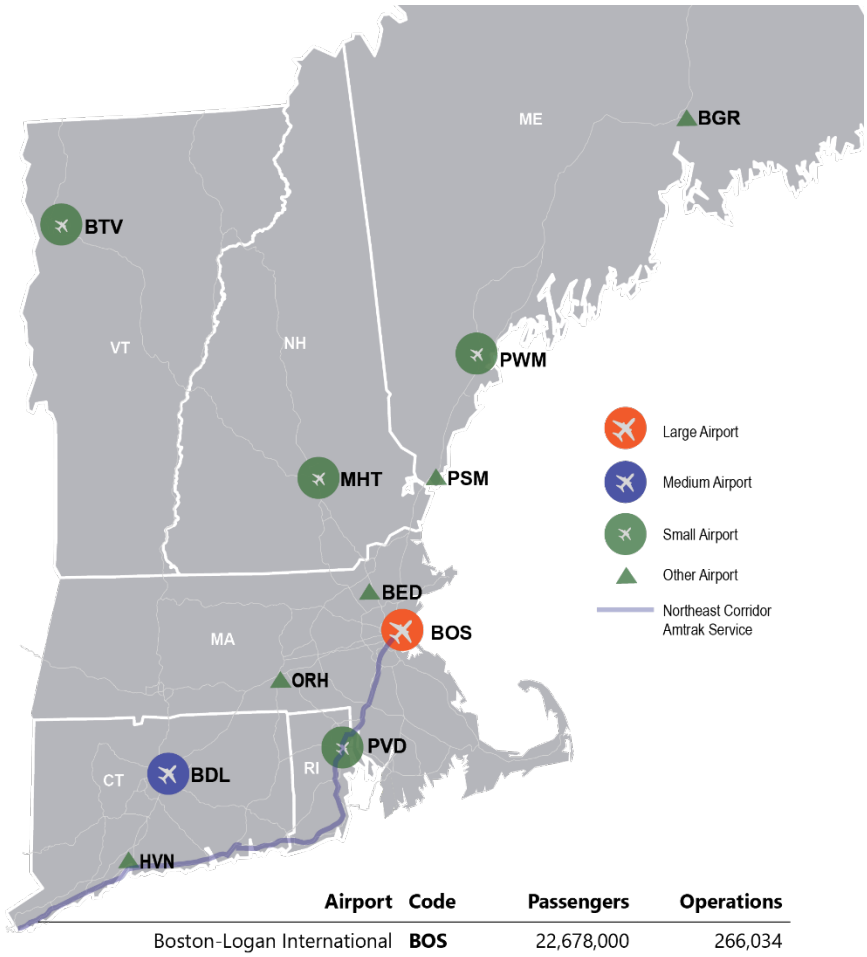
1 A regional airport is an airport serving traffic that supports regional economies by connecting communities to statewide and interstate markets.

2 A review of passenger and operations activity levels at Logan Airport is provided in Chapter 2, *Activity Levels*.

3 The *New England Regional Airport System Plan* (NERASP), which was published by the Federal Aviation Administration in 2006, includes Logan International Airport and these 10 regional airports: Bangor International, Bradley International, Burlington International, Hanscom Field, Manchester-Boston Regional, Portland International, Portsmouth International, Rhode Island T.F. Green International, Tweed-New Haven, and Worcester Regional airports.

4 Federal Aviation Administration. Final Calendar Year (CY) 2020 Passenger Boarding Data.

Figure 4-1 New England Regional Transportation System – 2021 Passenger and Operations Activity Levels at the 11 Commercial Service Airports



Airport	Code	Passengers	Operations
Boston-Logan International	**BOS**	22,678,000	266,034
Bradley International	**BDL**	4,620,000	72,807
Rhode Island T.F. Green International	**PVD**	2,334,000	56,246
Portland International Jetport	**PWM**	1,704,000	53,741
Manchester-Boston Regional	**MHT**	959,000	45,993
Burlington International	**BTV**	598,000	89,122
Bangor International	**BGR**	498,000	42,939
Portsmouth International	**PSM**	145,000	63,103
Tweed New Haven Regional	**HVN**	57,000	40,031
Worcester Regional	**ORH**	28,000	20,919
Hanscom Field	**BED**	16,000	124,566

Source: Federal Aviation Administration (FAA). 2021 preliminary. *Passenger Boarding Data*. Massport and individual airport data reports. https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/.

Note: Airport sizes are based on the FAA definition: Large Hub (1 percent or more of U.S. annual passenger boardings), Medium Hub (at least 0.25 percent, but less than 1 percent), Small Hub (at least 0.05 percent, but less than 0.25 percent); Other (Nonhub Primary – more than 10,000, but less than 0.05 percent). BOS, ORH, and BED are owned by Massport.

Logan Airport serves a major domestic origin and destination (O&D)[5] market and is the primary international gateway for the region. The regional airports range in role and activity levels, from Bradley International Airport, which served over 2.3 million commercial passengers in 2020 and over 4.6 million in 2021, to Hanscom Field, which does not currently handle any scheduled commercial flights but serves as New England's largest GA facility.

In addition to Logan Airport and the 10 regional airports shown in **Figure 4-1**, a third tier of commercial airports serves relatively isolated communities or provides seasonal or niche commercial air services in New England. These airports include:

- Hyannis Airport, Martha's Vineyard Airport, Nantucket Memorial Airport, New Bedford Regional Airport, and Provincetown Municipal Airport in Massachusetts;
- Augusta State Airport, Bar Harbor Airport, Rockland Airport, and Northern Maine Regional Airport in Maine;
- Lebanon Municipal Airport in New Hampshire;
- Block Island State Airport and Westerly State Airport in Rhode Island; and
- Rutland Southern Vermont Regional Airport in Vermont.

These third-tier airports support frequent commercial service to Logan Airport and, in some instances, Rhode Island T.F. Green International Airport during the summer months for those located in the Cape Cod area. Most of these third-tier airports are not in close proximity to Logan Airport and are isolated due to geographic factors. Because of their remoteness and/or limited market areas, many of these airports are unlikely to attract passengers that now fly from Logan Airport. Instead, many of these airports are dependent on Logan Airport for connecting services.

Strong Regional Economy Contributes to Growth Recovery at Logan Airport

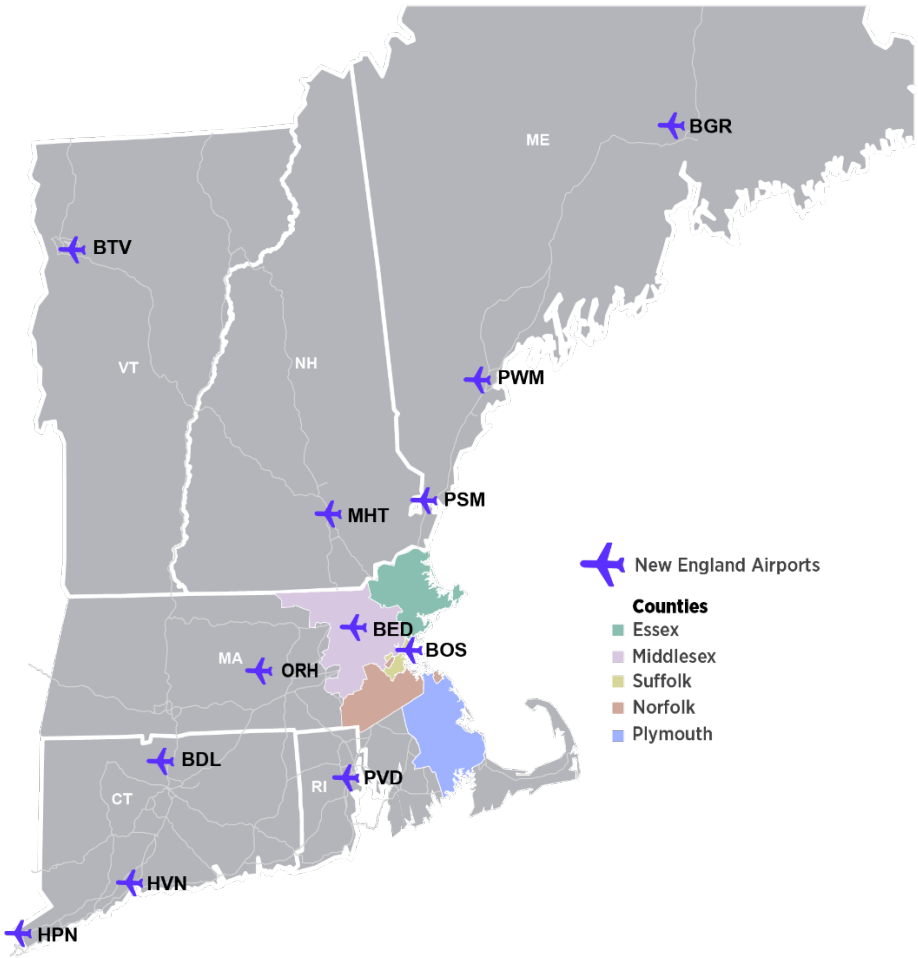
Through the end of 2019, the region surrounding Logan Airport had demonstrated strong economic growth over the last 10 years. This regional economic growth was the primary driver of growth at Logan Airport and demonstrates the close relationship between the regional economy and Logan Airport activity. The most recent Massachusetts Department of Transportation (MassDOT) 2019 Statewide Airport Economic Impact Study reported a 22-percent increase in total dollar economic output at Logan Airport from 2014 to 2019, which reflected increased contributions from visitor spending, airline and general aviation passenger traffic, new on-airport businesses, and returns on strategic investments. The robust regional economy drove Logan Airport's inbound and outbound passenger and cargo demand. Logan Airport is the predominant international airport in the region. Logan Airport's air service enables businesses to serve customers outside of New England as well as tourists who use services provided by local businesses. As the region's economy continues to rebound from the negative economic impacts faced during the early stages of the COVID pandemic, and in

5 "Origin and destination" (O&D) traffic refers to the passenger traffic that either originates or ends at a particular airport or market. A strong O&D market like Boston generates significant local passenger demand, with many passengers starting their journey and ending their journey in that market. O&D traffic is distinct from connecting traffic, which refers to the passenger traffic that does not originate or end at the airport but merely connects through the airport en route to another destination.

some cases, exceed pre-pandemic levels, Logan Airport's recovery to pre-pandemic levels has lagged compared to other large-hub airports across the nation. The stay-at-home orders or lockdown restrictions by national, state, and local governments worldwide at different stages of the pandemic, along with airline route planning decisions to cut and add-back capacity, have contributed to the Airport's activity recovery profile as discussed in Chapter 2, *Activity Levels*.

Logan Airport is the largest airport in the six-state New England region, which has a population of approximately 15.1 million residents in 2021 (see **Figure 4-2**). The Airport is located in Massachusetts, which is home to approximately 7.0 million residents, or 46.5 percent of the total population of New England as of 2021. The Airport serves passengers from across New England, with its primary catchment area consisting of five Massachusetts counties: Essex, Middlesex, Norfolk, Plymouth, and Suffolk (which includes the City of Boston). Approximately 4.4 million people reside in this five-county area (see **Table 4-1** and **Figure 4-3**).

Figure 4-2 Boston Logan International Airport Catchment Area



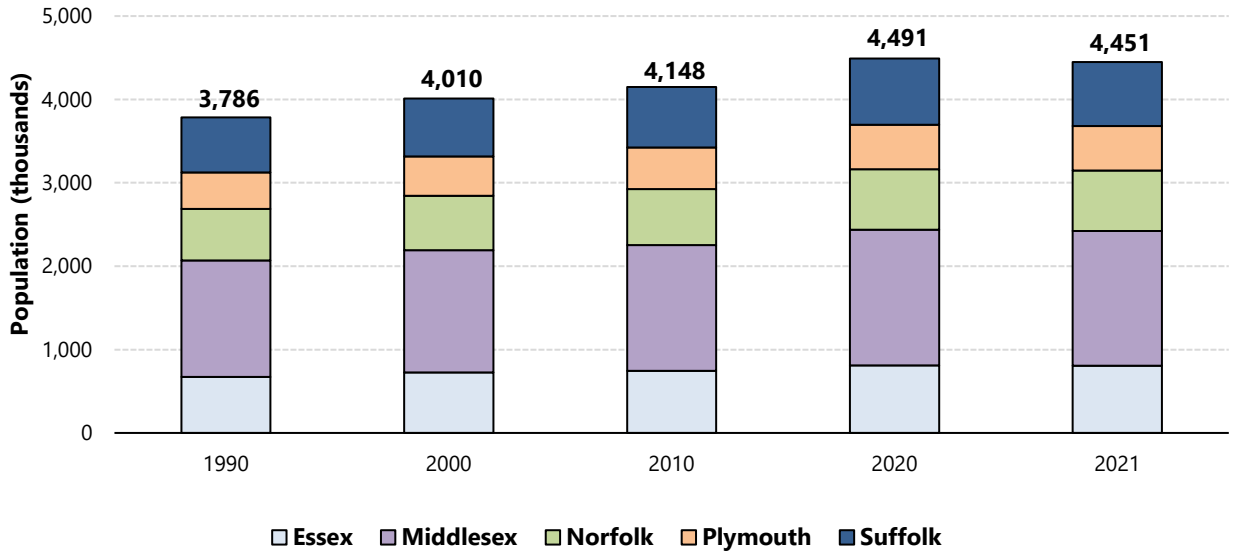
Source: VHB.
Notes: BDL – Bradley International Airport; BED – Lawrence G. Hanscom Field; BGR – Bangor International Airport; BOS – Boston Logan International Airport; BTV - Burlington International Airport; HPN – Westchester County Airport; HVN – Tweed New Haven Airport; MHT – Manchester-Boston Regional Airport; ORH – Worcester Regional Airport; PVD – T. F. Green Airport; PWM – Portland International Jetport.

Table 4-1 Population of Logan Airport Primary Catchment Area, 1990-2021

	Population (thousands)					Compound Annual Growth Rates		
County	**1990**	**2000**	**2010**	**2020**	**2021**	**1990-2000**	**2000-2010**	**2010-2021**
Essex	671	725	745	809	807	0.8%	0.3%	0.7%
Middlesex	1,399	1,467	1,508	1,629	1,615	0.5%	0.3%	0.6%
Norfolk	617	651	673	726	725	0.5%	0.3%	0.7%
Plymouth	436	474	496	531	533	0.8%	0.5%	0.7%
Suffolk	663	693	726	795	771	0.4%	0.5%	0.6%
Boston Catchment Area	**3,786**	**4,010**	**4,148**	**4,491**	**4,451**	**0.6%**	**0.3%**	**0.6%**
Massachusetts	6,023	6,361	6,566	7,022	6,985	0.5%	0.3%	0.6%
New England	13,230	13,950	14,470	15,101	15,093	0.5%	0.4%	0.4%
U.S.	249,623	282,162	309,327	331,501	331,894	1.2%	0.9%	0.6%

Source: Woods & Poole Economics, Inc. 2022. Complete Economic and Demographic Data Source (CEDDS).
Note: Due to rounding, the sums presented in the above figure may not add up precisely. Population data may have changed due to revisions conducted by the U.S. Department of Commerce. Population data shown in 2021 are estimates.

Figure 4-3 Logan Airport Primary Catchment Area Population Growth, 1990, 2000, 2010, 2020, 2021



Source: Woods & Poole Economics, Inc. 2022. Complete Economic and Demographic Data Source (CEDDS).
Note: Population data may have changed due to revisions conducted by the U.S. Department of Commerce. Population data shown in 2021 are estimates.

Although Logan Airport experienced rapid growth through 2019, the height of the COVID pandemic led to disproportionately lower passenger levels at the Airport than a majority of the nation's larger airports. This dramatic drop in both domestic and international travel appears to be the result of several factors including reduced tourism, fewer students attending universities/colleges in the area, restrictions on business/non-essential travel, and the decline in global gross domestic product (GDP). The annualized Massachusetts real GDP declined 43.8 percent in the second quarter of 2020, which was greater than the nation's annualized drop of 32.9 percent (largest in history for both). Massachusetts' GDP declined to a greater extent than in the U.S. as a whole because the Northeast was impacted earlier than other regions within the country[6] and the response of each state has been unique in terms of closures and restrictions to protect public health.

As the aviation industry continued its recovery path, business establishments reopened, and as governments eased and/or lifted border restrictions on non-essential travel, the U.S. GDP improved as the economy began to climb from its sharp decline experienced in the second quarter of 2020. Both the nation and Massachusetts expanded at the fastest pace in the third quarter of 2020, increasing real GDP at an annualized rate of 33.8 and 31.5 percent, respectively. Massachusetts' GDP levels continued to increase in the positive direction when by the third quarter of 2021, economic productivity exceeded pre-COVID levels on an annualized basis. In addition, unemployment rates also declined as businesses re-opened and economic activity improved thereafter.[7]

Prior to COVID-19, the Boston metropolitan area had consistently maintained a lower unemployment rate compared to the Commonwealth and the nation (see **Figure 4-4**). In 2019, the Boston metropolitan statistical area had an unemployment rate of 2.8 percent, which was lower than both the rate in the Commonwealth (3.1 percent) and the country (3.7 percent). Even during the 2008/2009 economic downturn, Boston and the Commonwealth experienced unemployment rates below the national average.[8] Massachusetts recorded a recent historical high unemployment rate of 16.7 percent in April 2020, which was greater than the national unemployment rate of 14.4 percent the same month.[9] After reaching record-high unemployment rates at the height of the pandemic in 2020, the Commonwealth's unemployment rate continued to fall steadily in the remaining months of 2020 and through 2021, falling to 4.1 percent in December 2021.

Logan Airport not only serves a growing population but a high earning one as well. Per capita income in 2020 was estimated at $85,724 (current U.S. dollars) in the Airport's primary service area, 11.3 percent higher than the Commonwealth and 44.9 percent higher than the national average.[10]

6 MassBenchmarks. July 2020.

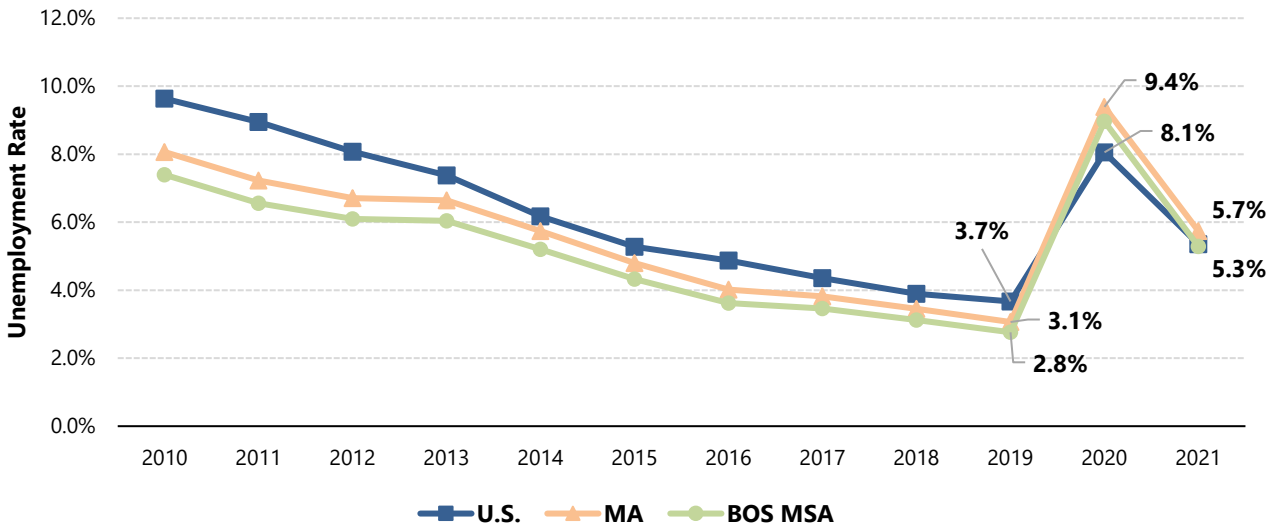
7 U.S. Department of Commerce, Bureau of Economic Analysis. UMass Donahue Institute, December 2021.

8 U.S. Bureau of Labor Statistics. 2020.

9 U.S. Bureau of Labor Statistics.

10 U.S. Department of Commerce, Bureau of Economic Analysis. Latest data for metropolitan statistical area was 2020.

Figure 4-4 Unemployment Rate Comparison: U.S., Massachusetts, and Boston Metropolitan Statistical Area (MSA), 2010–2021 (Annual-basis)



Source: U.S. Bureau of Labor Statistics. 2022.
Note: BOS MSA is represented as the Boston-Cambridge-Nashua, MA-NH Metropolitan NECTA (New England City and Town Area), as defined by the U.S. BLS. Not seasonally adjusted.

Logan Airport remains a key transportation and economic resource in the New England region, the state, and the Boston metropolitan area, which is home to a broad range of industries. The industries accounting for the largest share of employees include: healthcare and social assistance; educational services; and professional, scientific, and technology services (which include Boston's thriving biotechnology industry).[11] According to 2021 rankings, Massachusetts was ranked the #2 state in the U.S. for education, and #2 in healthcare.[12] The contribution of innovation and business start-ups in addition to the strong educational services and healthcare/biotech industries is also evident in the latest economic growth estimates. According to a recent JLL Innovation Geographies report,[13] Boston was ranked #4 for innovation, among other top global markets like Silicon Valley (i.e., San Jose, San Francisco) and Tokyo. The Boston region and Massachusetts as a whole are leaders in the life sciences industry and home to the most life sciences headquarters in the world, with more than 250 companies that each have over $100 million in funding.[14] Furthermore, by year-end 2021, the Massachusetts economy exceeded its annualized GDP from year-end 2019 by 3.0 percent, comparable to the U.S. exceeding its pre-pandemic levels with a growth of 2.3 percent.[15]

The full extent, however, of the ongoing impact of COVID will depend on future developments, including those outside the control of the airlines, related to possible increases in COVID cases and/or new quarantine requirements being imposed in certain jurisdictions or other restrictions on travel, the continued inoculation of

11 U.S. Census Bureau via DataUSA. 2019. Boston-Cambridge, Newton, MA-NH Metro Area Profile. www.datausa.io.

12 U.S. News & World Report 2021. Massachusetts.

13 JLL's Innovation Geographies, "Innovation-oriented industries and talent concentration to drive urban and real estate recovery," 25 January 2022.

14 Boston Business Journal, "Resilience and recovery: What is driving Boston's economy forward?" 21 March 2022.

15 U.S. Bureau of Economic Analysis. 2022. Real Gross Domestic Product by State (All industry total), Fourth Quarter and Annual 2021.

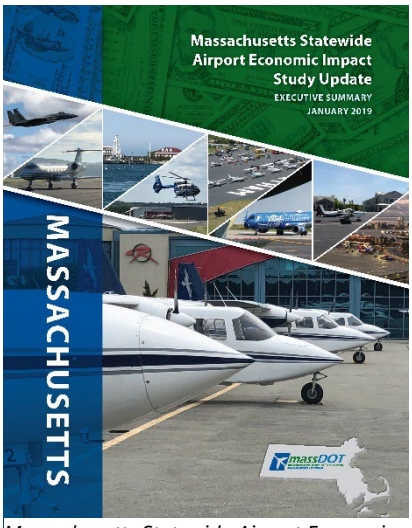
global populations with approved COVID-19 vaccines, and global hostilities (such as the war in Ukraine), all of which have uncertain outlooks. In addition, the impacts of changes in governmental foreign, fiscal, and monetary policies can influence the airline industry.

Massachusetts Aviation Economic Impact Study

In addition to supporting the growth and economic success of the state, Logan Airport and the airport industry are important elements in the state and regional economy. The *Massachusetts Statewide Airport Economic Impact Study Update,* completed by the Aeronautics Division of MassDOT in 2014 and most recently updated in 2019,[16] assesses the contribution of the statewide airport system (the 39 public use airports, including Logan Airport) to the economy of Massachusetts. The analysis found that Massachusetts public use airports generated $24.7 billion in total economic activity (this includes on-Airport businesses, construction, visitor, and multiplier effects).[17] **Figure 4-5** shows the total impact of Massachusetts airports in terms of employment, payroll, and total output. In particular, the analysis noted that Massport's three airports make significant contributions to the regional economy, generating approximately $23.1 billion, or 94 percent of the overall economic benefits generated by the Massachusetts airport system. Specifically, Logan Airport supports over 162,000 direct and indirect jobs, while generating approximately $16.3 billion per year in total economic activity.[18] For every $100 spent by aviation-related businesses, an additional multiplier impact of $56 is created within Massachusetts, according to the study.

While the economic impact of the region's airports was the focus of the study, it also noted qualitative benefits of the state's airports including:

- Providing police support and partnerships with first responders;
- Improving unmanned aircraft systems activities and training curriculums;
- Supporting aerial surveying, photography, and inspection operations;
- Conducting search-and-rescue operations;
- Supporting the U.S. military and other government operations;
- Prompting tenants/private developers to fund new airport infrastructure; and
- Stimulating workforce development challenges in the aviation industry. [19]



Massachusetts Statewide Airport Economic Impact Study Update, Report Cover.
Source: MassDOT

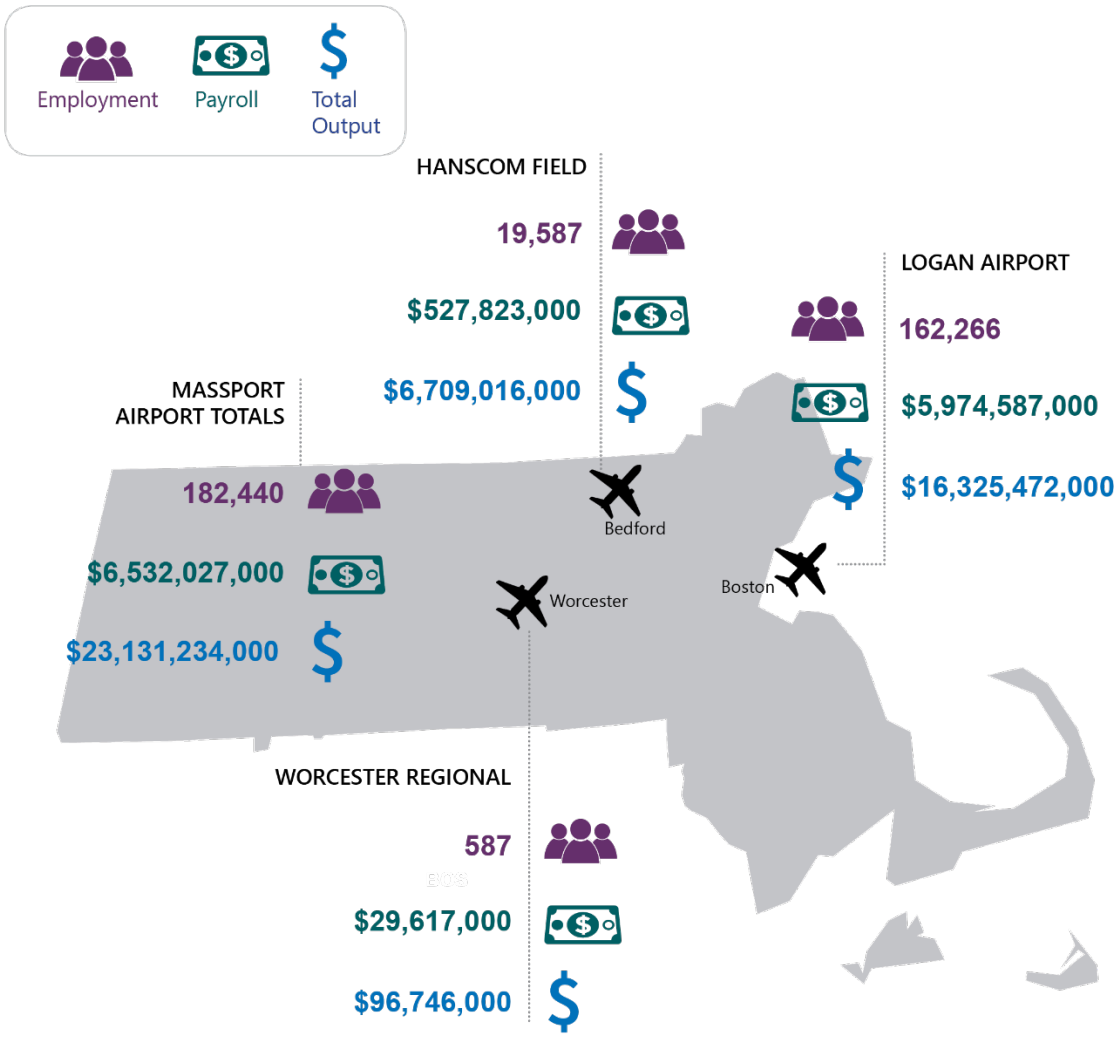
16 MassDOT Aeronautics Division. 2019. *Massachusetts Statewide Airport Economic Impact Study Update.* https://www.mass.gov/files/documents/2019/03/25/AeroEcon_ImpactStudy_January2019.pdf.

17 Multiplier effects refer to the recirculation of money in the local economy after initially being spent by the Airport, its tenants, or tourists. This recirculation increases the overall impact of the Airport's operation in the local economy.

18 MassDOT Aeronautics Division. 2019. *Massachusetts Statewide Airport Economic Impact Study Update.* https://www.mass.gov/files/documents/2019/03/25/AeroEcon_ImpactStudy_January2019.pdf.

19 *Ibid.*

Figure 4-5 Total Economic Impact of Massport Airports (2019)



Source: MassDOT, Massachusetts Statewide Airport Economic Impact Study Update, 2019.
Notes: "Massachusetts Totals" refers to the total economic output of all Massachusetts airports.

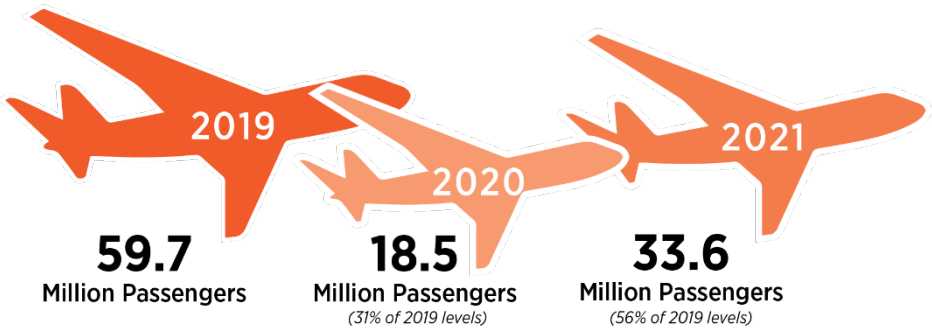
New England Regional Trends

Since 2000, as overall national and regional passenger activity levels have increased, aircraft operation activity levels have declined substantially due to trends of larger aircraft size, higher aircraft load factors, and reduced service in less profitable markets. The total number of aircraft operations at regional airports and Logan Airport declined from 1.6 million in 2000 to approximately 1.0 million in 2019. It fell further, however, due to the impacts of the pandemic in 2020 to 666,700, (or a decline of 35.7 percent versus 2019 levels of 1.04 million aircraft). However, in 2021, the number of aircraft operations increased to 875,500.

Air Passenger Trends

Prior to the pandemic, passenger traffic at the New England airports grew at a faster rate than the overall U.S. air passenger market.[20] New England passenger growth reflected increases at some New England regional airports, including Logan Airport (**Figure 4-6**). However, in 2020, total passenger activity levels across New England's commercial airports declined by 69.0 percent. Passenger traffic at the regional airports, excluding Logan Airport, fell slightly less than Logan Airport's traffic volume by about 65.6 percent. Logan Airport declined 70.3 percent for the same period, with a proportion of its total traffic influenced by international market segments, as discussed in Chapter 2, *Activity Levels*.

Figure 4-6 Passenger Activity at Logan Airport and Regional Airports in 2019, 2020, and 2021



Source: Massport and individual airport data reports.

Logan Airport's passenger activity fell over 70 percent by the end of 2020 compared to the previous year, and reported a year-end total of 12.6 million passengers (compared to 42.5 million in 2019). By year-end 2021, however, Logan Airport continued its passenger recovery and added 10 million annual passengers, reporting slightly over 22.6 million air passengers, which remained about 47 percent below its 2019 annual volume (see **Table 4-2**). Although the other regional airports exhibited stronger passenger recovery, ending 2021 about 35 percent below its 2019 traffic volume, Logan Airport continues to drive the greatest share of regional air passenger traffic, having recorded a share greater than 65 percent since 2012 (see **Figure 4-7**). Recent regional airport performances in 2020 and 2021 are listed below:

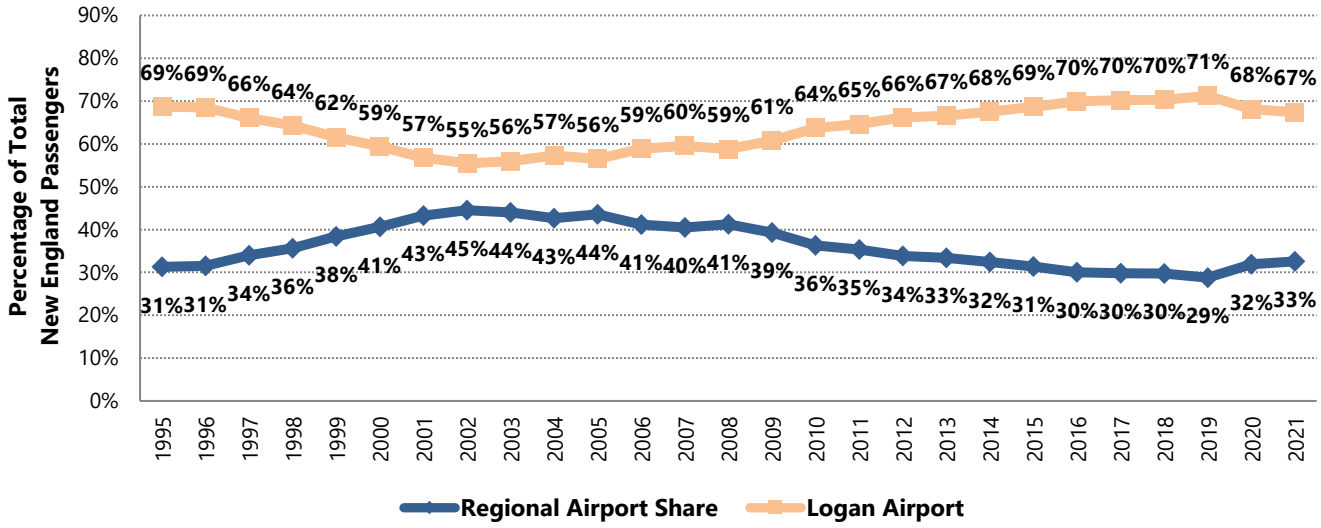
- In 2020 and 2021, the 10 regional airports accounted for a total of 5.9 and 11.0 million passengers, respectively, compared to 17.2 million passengers in 2019.
- In terms of market share, the 10 regional airports represented 31.9 percent share of total New England passengers in 2020 and 32.6 percent in 2021. In 2019, its regional share was 28.8 percent (see **Figure 4-7**). The gain in regional market share between 2020 and 2021 was primarily driven by fewer passengers at Logan Airport during the same years, particularly in the international segment.

Contrary to the recent upticks in passenger share at the regional airports, the growth of non-stop services offered by both low-cost carriers (LCCs) and ultra-low-cost carriers (ULCCs), and Delta Air Lines' and jetBlue

20 U.S. DOT. 2017. Bureau of Transportation Statistics for Total U.S. Scheduled Passenger Traffic.

Airways' continued hub strategy focus at Logan Airport, have contributed to traffic growth. On the other hand, new ULCC entrants like Allegiant Air, Avelo Airlines, Breeze Airways, Spirit Airlines, and Sun Country Airlines commenced operations at secondary and tertiary airports to capture pandemic-induced leisure demand promoting direct point-to-point service while mainline carriers have reduced industry-wide regional jet capacity. Between 2009 and 2019, passenger traffic at secondary airports grew at a slower average annual rate of 2.5 percent than Logan Airport, which increased 6.1 percent per year during the same time period. As a result, the regional airport passenger share decreased from 32.4 percent in 2014 to 28.8 percent in 2019 as Logan Airport widened its domestic and international route network and low-fare options became available while the regional airports offered more limited services, primarily to domestic markets.

Figure 4-7 Logan Airport's and Regional Airports' Share of New England Passengers, 1995-2021



Source: Massport and individual airport data reports.

Apart from Hanscom Field and Worcester Regional Airport, the regional airports closest to Logan Airport are Rhode Island T.F. Green International Airport in Warwick, Rhode Island and Manchester-Boston Regional Airport in Manchester, New Hampshire. Because of their proximity to Logan Airport and overlapping market areas, these airports are convenient choices for some passengers in the Greater Boston Area.

Logan Airport is well-positioned in terms of access, competitive airfares, and available air services to meet the demands of the core Boston air passenger market. Passenger traffic at Rhode Island T.F. Green International Airport and Manchester-Boston Regional Airport peaked in 2005. After the 2005 peak, there was an industry-wide trend of airline service reductions at smaller airports. Prior to the pandemic, the number of passengers at Rhode Island T.F. Green International Airport reached approximately 4.0 million in 2019 while at Manchester-Boston Regional Airport, the total number of passengers was approximately 1.7 million. Both airports as of 2021 have recovered to 58.5 percent and 56.5 percent of their 2019 levels, respectively. Rhode Island T.F. Green International Airport and Manchester-Boston Regional Airport, however, remain well situated to serve their own catchment areas.

Table 4-2 Passenger Activity at New England Regional Airports and Logan Airport (2000, 2010, 2015-2021)

	Passenger Levels (millions)[1]									Percent Recovery vs 2019 Levels	
Airport	**2000**	**2010**	**2015[2]**	**2016[2]**	**2017[2]**	**2018[2]**	**2019[2]**	**2020[2]**	**2021[2]**	**2020**	**2021**
Bradley International, CT	7.34	5.34	5.93	6.06	6.44	6.67	6.75	2.36	4.62	35.0%	68.4%
Rhode Island T.F. Green International, RI	5.43	3.94	3.57	3.65	3.94	4.30	3.99	1.31	2.33	32.9%	58.5%
Portland International Jetport, NH	1.34	1.71	1.73	1.79	1.86	2.13	2.18	0.79	1.70	36.4%	78.1%
Manchester-Boston Regional, NH	3.17	2.81	2.08	2.02	1.97	1.80	1.70	0.62	0.96	36.4%	56.5%
Burlington International, VT	0.90	1.30	1.19	1.21	1.18	1.32	1.37	0.40	0.60	29.1%	43.5%
Bangor International, ME	0.38	0.39	0.54	0.55	0.55	0.67	0.65	0.27	0.50	41.2%	76.5%
Portsmouth International, NH	0.07	0.00	0.09	0.13	0.19	0.17	0.23	0.08	0.15	34.3%	62.4%
Tweed-New Haven Regional, CT	0.08	0.07	0.07	0.06	0.06	0.08	0.10	0.02	0.06	24.2%	59.9%
Worcester Regional, MA	0.11	0.07	0.12	0.12	0.11	0.15	0.19	0.04	0.03	21.9%	14.3%
Hanscom Field, MA[4]	0.16	0.00[3]	0.00[3]	0.00[3]	0.00[3]	0.01	0.02	0.01	0.02	57.3%	104.1%
Regional Subtotal	**18.98**	**15.63**	**15.30**	**15.58**	**16.30**	**17.31**	**17.18**	**5.91**	**10.96**	**34.4%**	**63.8%**
Logan Airport	**27.73**	**27.43**	**33.45**	**36.29**	**38.41**	**40.94**	**42.52**	**12.62**	**22.68**	**29.7%**	**53.3%**
Total	**46.71**	**43.06**	**48.77**	**51.87**	**54.71**	**58.25**	**59.71**	**18.52**	**33.64**	**31.0%**	**56.3%**

Source: Massport and individual airport data reports. Non-Massport airports may be based on U.S. Department of Transportation (DOT), T-100 Database for scheduled and non-scheduled services, if direct airport records were unavailable.

Notes: Data for Logan Airport includes domestic, international, and general aviation passengers.
Numbers in parentheses ( ) indicate negative numbers. All calculations may not properly sum due to rounding.

1 All passengers in millions. Passenger levels are enplaned plus deplaned passengers (where available from airport records) or FAA enplaned passengers times two.

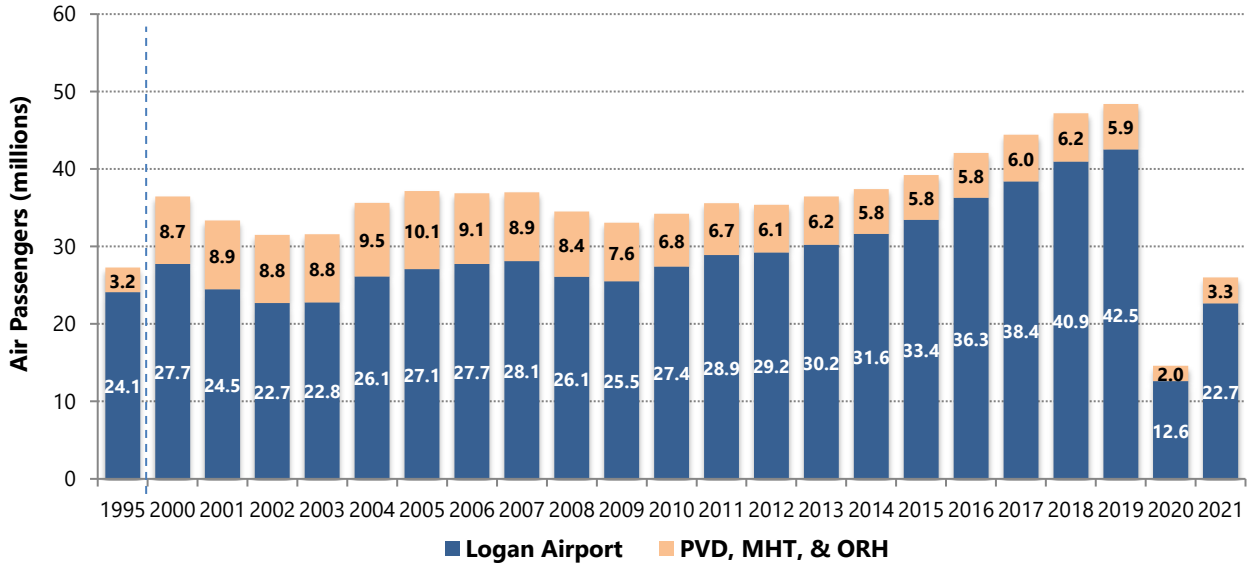
2 Reflects most updated passenger statistics for Manchester-Boston Regional, Portland International Jetport, and Portsmouth International airports based on latest available airport records accessed as of May 2022.

3 Indicates fewer than 7,000, but more than zero scheduled commercial passengers.

4 Hanscom Field also reported annual non-scheduled passengers above 9,000 between 2011 and 2021 via U.S. DOT T-100.

As of 2021, Rhode Island T.F. Green International Airport, Manchester-Boston Regional Airport, and Worcester Regional Airport served 12.8 percent (or 3.3 million) of the combined passengers at the three main regional commercial airports serving the Greater Boston area, slightly higher from 12.2 percent (5.9 million) in 2019, but remains significantly less than its recorded high share of approximately 28 percent (8.8 million) in 2002. **Figure 4-8** depicts the historical distribution of air passengers using Logan Airport, Rhode Island T.F. Green International Airport, Manchester-Boston Regional Airport and Worcester Regional Airport, which recommenced scheduled commercial services in 2013.

Figure 4-8 Passenger Activity Levels at Logan Airport (BOS), Rhode Island T.F. Green International Airport (PVD), Manchester-Boston Regional (MHT), and Worcester Regional (ORH) Airports, 1995, 2000-2021



Source: Massport and individual airport data reports.

Aircraft Operation Trends

Total aircraft operations in the region in the recent years since 2019 remained well below the region's historical aircraft operation levels seen in 2000. Total aircraft operations declined from about 1.6 million operations in 2000 to just over 1 million operations in 2019, prior to the pandemic. There were similarly large reductions in all three categories of activity: commercial (declined 25 percent in terms of absolute percent change), GA (negative 46 percent change), and military (negative 60 percent change). Several factors contributed to the declining trend in commercial airline operations, including a shift to larger capacity aircraft, higher passenger load factors onboard an aircraft, and a concurrent reduction in airline services at smaller regional airports given airline network strategies evolving. Military operations also declined, consistent with nationwide trends.

Similar to the increase in passenger activity levels at the majority of New England airports given the impact of the global pandemic, aircraft operations across New England in 2021 continued to recover towards pre-pandemic frequencies after experiencing a sharp reduction in flight activity in 2020.

- As shown in **Table 4-3**, total aircraft operations in the New England region (including Logan Airport) decreased in 2020 (666,663 operations) and increased in 2021 to 875,501 operations, when compared to 1,036,917 operations in 2019.
- In 2020, annual aircraft operations at Logan Airport declined year-over-year by 51.6 percent compared to the other 10 regional airports which in aggregate declined 24.6 percent.
- In 2021, total aircraft operations at Logan Airport increased by 59,332 operations between 2020 and 2021 to a total of 266,034, which represented 62.3 percent of Logan Airport's 2019 operation levels while total operations at the other regional airports increased by 149,506 during the same time period, ending the year with 609,467 movements, nearly equivalent to 2019 operation levels of 609,741.
- As a percent of 2019 levels, Logan Airport's total operations recovered 62.3 percent in 2021 while the rest of the region's airports recovered in aggregate to nearly 100 percent. Secondary airports like Burlington, Portsmouth, and Tweed-New Haven, which are located closer to multiple suburban communities outside the Greater Boston area, reported significant recovery growth supported by increased demand in both the GA and business aviation segments during the pandemic.

Although COVID-19 had an overall detrimental impact on the aviation industry, GA and business-related GA travel returned faster to pre-pandemic levels, due to increases in charter activity, recreational flying, and flight training operations. Businesses began to use non-commercial aircraft for employee safety and the promotion of remote working from home provided individuals the opportunity to choose to move outside major urban areas to smaller communities, shifting demand closer to GA airports. These trends contributed to increased GA activity in New England. On the other hand, commercial operations in the New England region increased from 2020 to 2021 as airlines gradually resumed nonstop scheduled services to routes that were temporarily suspended during the height of the pandemic. Combined GA operations in the New England region exceeded 2019 levels in 2021 by approximately 113 percent (401,230 operations) compared to 2019 with 353,981. In 2021, New England airports with commercial activity recovered about 66.8 percent of its 2019 operations. During this period, new market pairs were added along with new airline entrants at Logan Airport and the other regional airports. Overall, airlines returned and added capacity to high demand markets that generate favorable airline revenue, such as the Boston Metropolitan Area.

Crude oil prices in 2019 through 2021 declined affecting aviation AvGas and Jet-A fuel prices. Fuel costs usually account for a significant portion of GA aircraft operating costs compared to commercial airlines, and therefore the oil market can contribute to GA flying costs. It is worth noting that at the end of 2021, crude oil prices had surpassed pre-pandemic prices, and have continued to rise above $100 per barrel through 2022. GA operations continue to be the dominant type of aircraft activity at the regional airports. GA represented 6.7 and 9.0 percent of aircraft activity at Logan Airport in 2020 and 2021, respectively, which primarily accommodates the region's domestic and international commercial airline operations.

Overall, the regional airports accommodated a much greater share of the region's aircraft operations than their share of air passengers due to high levels of GA traffic. In 2021, the regional airports accounted for 32.6 percent of the region's passenger traffic, but 69.6 percent of aircraft activity. On average, there were approximately 13 passengers per aircraft operation at the regional airports in 2020, which increased to 18 in 2021, about 36 percent less than its 2019 average of 28 passengers, compared to 100 (2019), 61 (2020), and 85 (2021) passengers per operation at Logan Airport in their respective years, largely reflecting aircraft sizes.

Table 4-3 Aircraft Operations by Classification for New England's Airports (2019, 2020, 2021)

	2019				2020				2021			
Airport	**Commercial [1]**	**GA [2]**	**Military [2]**	**Total**	**Commercial [1]**	**GA [2]**	**Military [2]**	**Total**	**Commercial [1]**	**GA [2]**	**Military [2]**	**Total**
Bradley International	76,352	12,652	2,379	91,383	44,420	10,872	2,850	58,142	56,187	13,312	3,308	72,807
Rhode Island T.F. Green International	46,393	23,017	351	69,761	25,510	20,243	600	46,353	32,296	23,342	608	56,246
Portland International Jetport	35,855	21,731	646	58,232	21,559	16,832	937	39,328	30,955	21,822	964	53,741
Manchester-Boston Regional	34,965	15,762	412	51,139	24,153	13,892	655	38,700	25,520	19,795	678	45,993
Burlington	28,413	40,894	3,963	73,270	14,852	37,241	4,466	56,559	19,519	63,070	6,533	89,122
Bangor	17,678	17,117	10,805	45,600	11,184	11,970	11,792	34,946	16,231	13,968	12,740	42,939
Portsmouth International	9,346	28,742	3,457	41,545	7,225	28,656	2,672	38,553	11,272	45,981	5,850	63,103
Tweed-New Haven	6,094	21,853	483	28,430	2,754	27,393	262	30,409	3,600	36,025	406	40,031
Worcester Regional [5]	5,554	17,186	745	23,485	2,486	14,109	651	17,246	2,087	16,929	1,903	20,919
Hanscom Field [3 4]	426	127,670	575	128,671	231	98,925	569	99,725	448	122,944	1,174	124,566
Subtotal	**261,076**	**326,624**	**23,816**	**611,516**	**154,374**	**280,133**	**25,454**	**459,961**	**198,115**	**377,188**	**34,164**	**609,467**
Logan Airport	398,254	28,922	0	427,176	192,844	13,858	0	206,702	241,992	24,042	0	266,034
Total	**659,330**	**355,546**	**23,816**	**1,038,692**	**347,218**	**293,991**	**25,454**	**666,663**	**440,107**	**401,230**	**34,164**	**875,501**

Table 4-3 Aircraft Operations by Classification for New England's Airports (2019, 2020, 2021) (Continued)

	Percent Recovery (2020 vs 2019)				Percent Recovery (2021 vs 2019)			
Airport	**Commercial [1]**	**GA [2]**	**Military [2]**	**Total**	**Commercial [1]**	**GA [2]**	**Military [2]**	**Total**
Bradley International	58.2%	85.9%	119.8%	63.6%	73.6%	105.2%	139.1%	79.7%
Rhode Island T.F. Green International	55.0%	87.9%	170.9%	66.4%	69.6%	101.4%	173.2%	80.6%
Portland International Jetport	60.1%	77.5%	145.0%	67.5%	86.3%	100.4%	149.2%	92.3%
Manchester-Boston Regional	69.1%	88.1%	159.0%	75.7%	73.0%	125.6%	164.6%	89.9%
Burlington	52.3%	91.1%	112.7%	77.2%	68.7%	154.2%	164.8%	121.6%
Bangor [5]	63.3%	69.9%	109.1%	76.6%	91.8%	81.6%	117.9%	94.2%
Portsmouth International	77.3%	99.7%	77.3%	92.8%	120.6%	160.0%	169.2%	151.9%
Tweed-New Haven	45.2%	125.4%	54.2%	107.0%	59.1%	164.9%	84.1%	140.8%
Worcester Regional	44.8%	82.1%	87.4%	73.4%	37.6%	98.5%	255.4%	89.1%
Hanscom Field	54.2%	77.5%	99.0%	77.5%	105.2%	96.3%	204.2%	96.8%
Subtotal	**59.1%**	**85.8%**	**106.9%**	**75.2%**	**75.9%**	**115.5%**	**143.4%**	**99.7%**
Logan Airport	48.4%	47.9%	n/a	48.4%	60.8%	83.1%	n/a	62.3%
Total	**52.7%**	**82.7%**	**106.9%**	**64.2%**	**66.8%**	**112.8%**	**143.4%**	**84.3%**

Sources: Federal Aviation Administration (FAA) tower counts; Massport and individual airport data reports.

Notes: Ranked by commercial operations. FAA tower counts used for all airports except Logan Airport and Portsmouth International.
Numbers in parentheses ( ) indicate negative numbers. GA – General Aviation.

1 May include some Air Taxi operations by fractional jet operators. FAA tower counts combine some fractional jet operations with small regional/commuter airline operations.

2 Includes itinerant and local operations at the regional airports. Military operations at Logan Airport are negligible and not included in Massport counts.

3 Value represents non-scheduled commercial activity.

4 Values sourced from *2017 L. G. Hanscom Field Environmental Status & Planning Report* reflect updated CY 2017 based on FAA tower counts since the publication of the *2017 ESPR*.

5 Reflects updated CY 2019 aircraft operation statistics based on updated FAA tower counts and includes Part 139 operations not recorded by Tower (2100 local – 0630 local) since the publication of the *2018/2019 EDR*.

Airline Passenger Service in 2020 and 2021

Airlines can adjust service at an airport or on a specific route in two ways: by increasing or decreasing the number of flights operated and/or changing the size of the aircraft flown on the route. Changes in flight frequency and in aircraft size affect the number of seats available to passengers, also known as seat capacity. Airline services are therefore discussed in terms of seat capacity as well as the number of flight departures.[21] This section examines changes in airline departures and seat capacity and provides an overview of new and discontinued routes at the regional airports in 2020 and 2021.

In response to industry-specific challenges created by the pandemic, the U.S. Treasury provided assistance to passenger air carriers, cargo air carriers, aviation contractors, and national security businesses, under the Coronavirus Aid, Relief and Economic Security (CARES) Act, the Consolidated Appropriations Act, 2021, and the American Rescue Plan Act of 2021 (ARP). Sections 4005 and 4114(b) of the CARES Act also authorized the U.S. Department of Transportation (DOT) to require an air carrier receiving CARES Act funding to maintain scheduled air transportation. This included the Air Carrier Worker Support Program (ACWSP), which supported payroll efforts to passenger airlines and certain airline contractors to maintain employment and avoid involuntary furloughs and job layoffs through September 2020. The Final Order issued required the air carriers receiving financial assistance under the CARES Act to maintain minimum air services on a nationwide basis, with some exceptions.[22] Parameters for continued U.S. air connectivity were based on a passenger carrier's overall domestic market share to a covered point prior to March 2020. The assistance program was further extended via the creation of the Payroll Support Program Extension (PSP2, which was set to expire on March 31, 2021; and PSP3, where funds were exhausted by September 30, 2021).[23] Passenger air carriers receiving payroll support greater than $100 million were required to provide financial instruments as appropriate compensation to the U.S. Government for the provision of the financial assistance. Not all carriers that participated in the first round(s) of financial assistance, however, applied for subsequent rounds.

Service Developments at the Regional Airports

In 2020, a total of 14 airlines and in 2021, a total of 15 airlines provided scheduled passenger service from the 10 regional airports.[24] In 2021, three new carriers commenced operations out of the regional airports, including Breeze Airways, Boutique Air, and Avelo Airlines.

All of the New England regional airports except for Worcester Regional Airport and Manchester-Boston Regional Airport saw an increase in scheduled commercial departing seat capacity between 2020 and 2021. Seat capacity at Worcester Regional Airport declined an additional 36.5 percent in 2021 compared to the prior

21 A departure is an aircraft take-off at an airport. While aircraft operations include both departures and arrivals, airline services are typically described in terms of departures, as the number of scheduled departures generally equals the number of scheduled arrivals. Changes in departures translate to changes in overall operations.

22 U.S. DOT. "U.S. Department of Transportation Issues Final Order on Service Obligations for Air Carriers Receiving Financial Relief Through CARES Act", 7 April 2020.

23 U.S. Department of the Treasury. Data current as of 10 February 2022.

24 Includes Allegiant Air, which served Bangor International Airport (Orlando/Sanford and St. Petersburg/Clearwater service), Rhode Island T.F. Green International Airport (Cincinnati, Punta Gorda, and Savannah service), and Portsmouth International Airport (Savannah, Myrtle Beach, Punta Gorda, and Orlando/Sanford service).

year after seat capacity fell 63.2 percent in 2020. Most carrier services have been restored at Worcester as of the date of this report.

Prior to the pandemic in 2020, the steep airline service cuts seen after 2007 due to the 2008/2009 economic recession and high fuel prices had largely come to an end, however, airlines continued to be conservative in growing capacity, resulting in reduced frequencies on less profitable routes or introducing larger aircraft with greater seat counts onboard (i.e., "up-gauging" aircraft size) for particular routes. Most of this recent growth was lost in early 2020.

Worcester Regional Airport (ORH)

Worcester Regional Airport is located in Worcester and Leicester (central Massachusetts), approximately 50 miles west of Logan Airport. Worcester Regional Airport is an important aviation resource that accommodates both corporate GA activity and limited commercial airline services. Massport assumed operation of Worcester Regional Airport in 2000 and later acquired the airport from the City of Worcester in June 2010.

jetBlue E-190 aircraft at Worcester Regional Airport. Source: Massport.

Massport continues to invest in Worcester Regional Airport by modernizing the airport to better serve the commercial airline travel demands of the central Massachusetts region. Together with the City of Worcester and the Federal Aviation Administration (FAA), Massport have made more than $100 million investments to revitalize and attract commercial operations to Worcester Regional Airport. Massport, in conjunction with the City of Worcester and other community stakeholders, actively promoted the reintroduction of scheduled airline service at Worcester Regional Airport and successfully secured new service provided by jetBlue Airways, including non-stop service to Orlando International and Fort Lauderdale-Hollywood airports. This service has proven to be popular, with jetBlue Airways achieving consistently high load factors (over 78 percent between 2017-2019)[25] and handling 132,800 passengers in 2018 and 150,200 passengers in 2019 representing a year-over-year growth of over 13 percent.

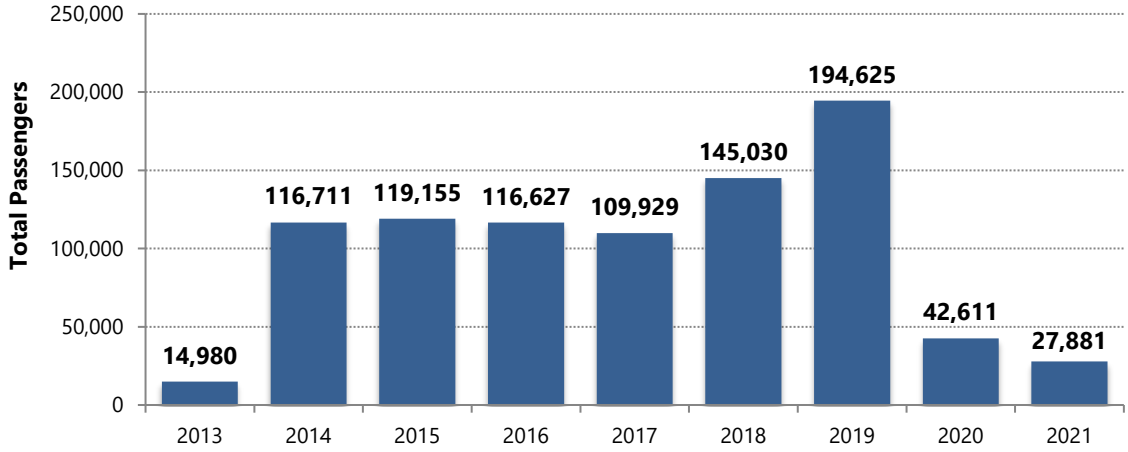
Passenger and Operation Trends

Worcester Regional Airport had experienced consecutive commercial passenger growth at an average rate of 30 percent per year between 2013 and 2019, serving a cumulative total of 817,057 commercial air passengers (**Figure 4-9**). From 2020 to 2021, Worcester Regional Airport saw passenger numbers decline by approximately 78 percent from 194,625 passengers in 2019 to 42,611 in 2020, followed by a further decline of approximately 35 percent to 27,881 in 2021.

25 jetBlue Airways services at Worcester Regional Airport had an average load factor of 84 percent in 2015, 81 percent in 2016, and 78 percent in 2017-2019 (U.S. DOT, T-100 Database).

Although commercial air passenger numbers have fallen, GA and military operations at Worcester Regional Airport have exceeded levels seen in 2019 **(Table 4-3**), by approximately 8.4 percent and 171.5 percent, respectively.

Figure 4-9 Passenger Activity at Worcester Regional Airport, 2013–2021



Source: Massport.

Service Developments

In 2019, Worcester Regional Airport was served by jetBlue Airways, American Airlines, and Delta Air Lines. jetBlue offered non-stop service to Fort Lauderdale and Orlando. Prior to the entry of jetBlue Airways in 2013, Worcester Regional Airport was served only by Direct Air, which operated regularly scheduled charter services from 2008 to 2012. When Direct Air filed for Chapter 7 bankruptcy in April 2012, Worcester Regional Airport no longer provided commercial service. After Direct Air ceased operations, Worcester Regional Airport returned to commercial service, with two daily scheduled departures operated by jetBlue Airways.

Massport, in conjunction with the City of Worcester and other community stakeholders, actively promoted the reintroduction of scheduled airline service at Worcester Regional Airport and successfully secured new service provided by jetBlue Airways. In November 2013, jetBlue Airways commenced non-stop services to Orlando International and Fort Lauderdale-Hollywood airports using 100-seat Embraer 190 aircraft. Five years later, American Airlines began offering flights to Philadelphia International Airport in October 2018 and Delta Air Lines initiated flights to Detroit Metropolitan Airport beginning in August 2019.

In response to COVID-19, all three airlines temporarily suspended service in and out of the Worcester Regional Airport between October 2020 and July 2021. By August 2021, Worcester Regional Airport welcomed back nonstop service to New York John F. Kennedy International Airport (JFK), which grew to twice daily by December 2021. jetBlue also restarted operations to Fort Lauderdale in October 2021. American Airlines and Delta Air Lines re-commenced daily service to New York LaGuardia and Philadelphia, respectively, in November 2021. Although Delta previously operated flights to its hub in Detroit prior to the pandemic, according to published OAG schedules,[26] there remains to be no nonstop service between the two airports in 2022.

26 Published schedules as of September 2022.

Facility Improvements

Massport, in collaboration with the City of Worcester and with the use of federal grants, initiated a 10-year, $100 million investment to revitalize and increase commercial operations at Worcester Regional Airport. Massport is committed to the long-term support of Worcester Regional Airport as demonstrated by the following initiatives:

- Massport completed construction of Worcester Regional Airport's Instrument Landing Category (CAT) III Instrument Landing System in 2018, which has significantly improved operational conditions and enhanced safety to a level equal to that of all other commercial airports in New England. These improvements allow aircraft to land on Runway 11 during virtually all weather conditions. The CAT III system became fully operational after FAA certification in March 2018.
- This project included upgrading the Runway 11 Instrument Landing System from a CAT I to a CAT III system, and its associated required infrastructure and navigation aids, along with a partial parallel taxiway. This project significantly improves Worcester Regional Airport's all-weather reliability.
- Massport received a federal grant for two jet passenger boarding bridges through the FAA's Airport Improvement Program. The jet bridges will include ground power and preconditioned air for Gates 3 and 4 in the commercial terminal building, which add environmental benefits by reducing air and greenhouse gas emissions and conserving fuel.

CAT III Instrument Landing System.
Source: Massport.

- Rectrix Commercial Aviation Services, Inc. (Rectrix)—which was recently acquired by Ross Aviation[27] in February 2019 - developed a state-of-the-art aircraft hangar and office space. The project included 27,000 square feet of hangar and office space that house large corporate jets and a regional aircraft maintenance facility. Ross Aviation offers private jet charters and fixed base operator (FBO) services, including transient aircraft parking and fueling services, from the new facility. A replacement fuel storage center ("fuel farm") commenced in 2019 and became operational in 2020. Located near the hangars, the new fuel farm makes the availability of fuel for airlines and private jets more reliable.
- In 2020, planning for Phase II of the Ross Rectrix Aviation redevelopment proceeded with the focus on siting of replacement hangars.
- In 2021, Massport began work on the rehabilitation and safety enhancement project on the northern end of Taxiway B, which runs parallel to Runway 15-33, costing $2.1 million, and is funded by a grant from the FAA. The project is not expected to impact flights.

27 Ross Aviation already has fixed-base operations at airports in Alaska, California, Arizona, New York, and the Cayman Islands. Ross-Rectrix Aviation is now the fixed-base operator at Worcester Regional Airport, Hanscom Field, Westfield-Barnes, and Barnstable Municipal Airports in Massachusetts.

Hanscom Field (BED)

Located in Bedford, Massachusetts, approximately 20 miles northwest of Logan Airport, Hanscom Field is New England's premier facility for business/corporate aviation. Hanscom Field is a full-service GA airport that serves a critical role as a GA reliever airport for Logan Airport by accommodating a wide variety of GA activities, including corporate aviation, private flying, commuter air services, as well as charters and light cargo. Hanscom Field is a joint commercial-military facility and also home to the Hanscom Air Force Base and the 66th Air Base Group. Over 99 percent of air traffic is non-military.

Hanscom Field accommodated 98,925 GA operations in 2020 and 122,944 operations in 2021 which is greater than five times the number of GA operations reported at Logan Airport. Hanscom Field was not impacted as severely as Worcester Regional Airport and Logan Airport because its operations are mainly comprised of private jets and non-commercial airlines as mentioned previously. Consistent with Hanscom Field's role as a premier corporate airport, new and replacement hangars are being built to accommodate the need for corporate jet services. In addition to its role as a GA facility, in the past, Hanscom Field has also accommodated niche scheduled commercial airline services, but in general offers limited to no commercial service.

Passenger and Operation Trends

Passenger activity[28] at Hanscom Field is currently limited to non-scheduled passenger service, primarily because of charter flight operations. Total passenger activity has remained relatively consistent since 2013 (**Table 4-2**). Overall, aircraft operations decreased from 128,671 in 2019 to 99,725 in 2020 but increased to 124,566 in 2021, which represents an approximately 97 percent recovery to 2019 levels.

Facility Improvements

Massport continues to invest in Hanscom Field to improve and upgrade facilities and maintain a safe, secure, and efficient airport. Past and future capital investments ensure that Hanscom Field can continue to serve its role as a GA reliever to Logan Airport as well as a premier business aviation facility for the region. These airport improvement projects are summarized in the annual reports on *The State of Hanscom*.[29] According to the proposed Fiscal Year (FY) 2019-2023 Capital Program, Massport invested over $34.7 million in completed and ongoing projects, with $17.3 million categorized under proposed projects.

Massport's recently completed and ongoing capital investment projects at Hanscom Field include:

- Rehabilitation of East Ramp and replacing outdated taxiway light fixtures with Light-Emitting Diode (LED) fixtures on Taxiway Juliet, south of Taxiway Tango;
- Ongoing removal of vegetation obstructions on all four runway ends using recommendations prescribed in the 2019 to 2023 *Vegetation Management Plan* updates;
- Construction of a new Airport Rescue and Firefighting Facility (ARFF) and U.S. Customs and Border Protection (CBP) permanent facility, which opened in May 2019;

28 Passenger activity reports on "non-scheduled" passenger enplanements. There was no "scheduled" service or passenger activity at Hanscom Field.

29 Massport. March 2020. *The State of Hanscom*. https://www.massport.com/media/xxnhegbv/state-of-hanscom-2019.pdf.

- Continued implementation of all aspects of Massport's *Wildlife Hazard Management Plan* for Hanscom Field;
- Continued annual program to replace sections of perimeter fencing and implementation of the SAFE e-badging program at Hanscom Field to develop a streamlined and standardized system across all airports;
- Replacement of the field maintenance garage roof, which had reached the end of its useful life;
- An Airfield Geometry Study; and
- A new Boston MedFlight Leadership in Energy and Environmental Design (LEED®) certified hangar.

Upcoming projects at Hanscom Field include:

- Periodic replacement of T-Hangars in the terminal area;
- Improvements to airfield drainage;
- Rehabilitate Taxiways, West Ramp, and Runway 5-23;
- Replacement of salt storage enclosure, airfield snow equipment and fire protection infrastructure; and
- Updates to aging infrastructure, including new corporate hangars, and replacement of the Pine Hill T Hangars with Box Hangars on the North Airfield (ongoing).

In addition to Massport's investments, the Authority solicits third-party development of facilities that support and enhance Hanscom Field's role in the regional transportation system. Many of the hangars at Hanscom Field are owned or leased by tenants who are responsible for maintaining them. Ongoing third-party projects at Hanscom Field are listed below.

- In 2017, Massport was working with General Services Administration (GSA) to acquire a parcel of land north of the airfield, which was at that time owned by the U.S. Navy. In April 2018, Massport declined the transfer of the Navy property and the land was sold to Runway Reality Ventures, LLC for $9 million in a GSA auction. As of summer 2022, negotiations are underway with Massport in regards to a land swap that would trade frontage land along Taxiway Romeo in exchange for land east and west of the existing hangar.
- Massport issued a Request for Proposals (RFP) in February of 2018 for redevelopment of a site immediately west of the Navy Hangar. An Environmental Assessment (EA) for development of the property was filed for up to 110,000 square feet of corporate hangar development at this location. No bids were received at this time.
- In March 2019, Massport issued a RFP for design services associated with replacement of the Pine Hill T-Hangars to a 7-acre site west of the Navy Hangar. Replacement of three T-Hangar rows was completed in 2019 and plans to relocate the Pine Hill T-hangars from its current site to the North Airfield area were finalized. Construction of replacement T-Hangars and supporting taxiways started in the spring of 2021 and is expected to last approximately 18 months.
- In August 2021, Massport re-issued the RFP for the development of approximately 28 acres of the North Airfield. In 2022, Massport accepted a proposal by Runway Reality Ventures, LLC for redevelopment of this area. Concept plans are currently in development.

Bradley International Airport (BDL)

In 2011, the Connecticut Airport Authority (CAA) was established to oversee the operation and development of Bradley International Airport. The CAA, a quasi-public agency consisting of an 11-member board, manages day-to-day operations at Bradley International Airport, as well as at five GA airports in Connecticut (Danielson, Groton/New London, Hartford Brainard, Waterbury-Oxford, and Windham airports). The goal of the CAA is to transform Bradley International Airport and the five GA airports into economic drivers for the state. Bradley International Airport was previously run by a board under the Connecticut Department of Transportation (ConnDOT).

Passenger and Operation Trends

Passenger activity at Bradley International Airport was increasing steadily up until 2019 which marked the eighth straight year of passenger traffic growth since 2012. However, the passenger traffic dropped to 2.36 million in 2020 due to the impact of COVID-19 pandemic. Its traffic has shown positive signs of revival in 2021 having recovered 68 percent of its 2019 traffic levels **(Table 4-2)**. Similarly, aircraft operations at Bradley International Airport decreased to 58,142 in 2020, and then revived up to 72,807 in 2021, representing a 79.7 percent recovery as compared to 2019 flight volumes (**Table 4-3**). The steady revival in 2021 operations is also attributed by Breeze Airways launching new nonstop services connecting Charleston, Columbus, Norfolk, Pittsburgh to Hartford. Breeze Airways is set to expand their services to Nashville, Tennessee; Akron/Canton, Ohio; Savannah, Georgia; Richmond, Virginia; Jacksonville, Florida; and Sarasota/Bradenton, Florida which are scheduled to commence June 2022. In addition to Breeze Airway's ultra-low cost entrance, Sun Country Airlines commenced services to Minneapolis and Orlando while Southwest Airlines offered connections to Nashville as well in 2021.

Facility Improvements

The ongoing capital improvement program includes the following projects:

- A consolidated rental car facility;
- Ground Transportation Center (opened in July 2022);
- Demolition of the Murphy Terminal;
- Roadway demolition and re-alignment;
- Utility relocation; and
- Airfield improvements.

In March 2019, the airport published a $1.4-billion master plan that proposed a range of near-term (2017-2022), mid-term (2023-2027) and long-term (2028-2037) projects, which includes the following initiatives:

- New passenger Terminal B building;
- Reconfiguration of Schoephoester Road;
- Taxiway enhancement;
- New Baggage inspection/federal inspection service facility; and
- Additional parking.

Rhode Island T.F. Green International Airport (PVD)

Rhode Island T.F. Green International Airport, located in Warwick, Rhode Island, is the first state-owned and operated airport in the U.S. Rhode Island T.F. Green International Airport is owned by the Rhode Island Airport Corporation (RIAC). In May of 2021, RIAC changed the airport's name to include Rhode Island and International to better support Rhode Island's economy and tourist sector.

Passenger and Operation Trends

Passenger traffic declined by approximately 65 percent in 2020 to 1.31 million passengers and in 2021, reported 2.33 million passengers, which represents an approximately 59 percent recovery of its 2019 levels of approximately 4.0 million passengers (**Table 4-2**). Prior to the pandemic, passenger traffic also declined by approximately 7.2 percent from 2018 to 2019. Aircraft operations declined to 46,353 in 2020 from 69,761 in 2019 (**Table 4-3**); although commercial and GA activity saw a reduction, military operations were an exception and increased by approximately 70 percent in 2020 and remained steady in 2021. In 2021, GA operations exceeded 2019 activity levels by approximately 1.4 percent whereas the commercial flights have recovered to 69.6 percent. Rhode Island T.F. Green International Airport remains well situated to serve its own catchment area.

In terms of scheduled seat capacity, Rhode Island T.F. Green International Airport has attracted new domestic service from jetBlue Airways in 2020 (added two destinations to Florida) and Breeze Airways in 2021 (added three destinations, similar to the first markets launched at Hartford: Charleston, Norfolk, and Pittsburgh).

Facility Improvements/Master Plan Update

In April 2019, RIAC announced a $1.3-million update of the Airport's Master Plan to focus on defining plans to accommodate forecasted demand over a 20-year period. Initial workshops were held in June 2019. The long-range forecast evaluated passenger growth from 1.9 million annual passengers to 3.7 million annual passengers and growth in annual aircraft operations from 72,000 to 89,000. In 2020, RIAC announced that it is getting a $4.7 million grant to modernize the terminal, acquire land, upgrade the runways, and study effective noise reduction strategies. RIAC finalized and submitted the Rhode Island T.F. Green International Airport's Master Plan to the FAA in early 2021. The report included essential inputs gathered from public meetings and workshops involving key stakeholders within the Technical Advisory Committee (TAC). The committee conceptualized airside, terminal, landside, and cargo/general aviation developments based on upon the forecast needs. The TAC is comprised of various governmental agencies, airlines, concessions, and private businesses.

Manchester-Boston Regional Airport (MHT)

Manchester-Boston Regional Airport is in Manchester, New Hampshire, less than 50 miles north of Boston, Massachusetts. The airport is owned by the City of Manchester with airport management consisting of a five-member board. By 2005, over 4 million passengers were using Manchester-Boston Regional Airport. However, the passenger level has been declining for the past few years. In 2018, Manchester-Boston Regional Airport served approximately 1.85 million passengers, and approximately 1.70 million passengers were served in 2019. However, the traffic decreased to 0.62 million in 2020 due to the effects of the COVID-19 pandemic.

Passenger and Operation Trends

Passenger activity at Manchester-Boston Regional Airport has shown signs of recovery having regained 56.5 percent of total traffic volumes in 2021 as compared to 2019 levels. The airport experienced an average annual decline in passenger traffic over the last decade (**Table 4-2**). Overall, aircraft operations have also declined to 38,700 in 2020 from 51,139 in 2019. Military operations, however, exceeded its 2019 levels of 412 movements by 59 percent in 2020 (655 movements), and continued to grow in 2021 to approximately 65 percent higher than 2019 levels (678 movements). Total aircraft operations increased in 2021 to 45,993 in 2021, or 89.9 percent of 2019 flight levels, led mainly by the recovery in GA operation movements which exceeded 2019 levels by over 25 percent (**Table 4-3**).

Facility Improvements

Manchester-Boston Regional Airport completed its most recent Airport Master Plan Update in 2011. The Airport Master Plan Update provides a blueprint for development and improvement of airport facilities and infrastructure through 2030. Recent and ongoing improvement projects at the airport include:

- Demolition of structures in the runway protection zone (RPZ)[30] of Runway 06 to remove buildings with usages deemed non-compatible with RPZs, as defined by the FAA. Elements of the project include demolishing the Highlander Inn and Conference Center and associated buildings.
- Upgrades to the terminal building heating, ventilation, and air conditioning (HVAC) systems to address certain deficiencies in the terminal cooling system and provide significant improvements to customer comfort levels within areas of the terminal building.
- Parking Lot A access improvements.
- Overlay of a portion of Taxiway M.
- Reconstruction of Taxiway H pavement of approximately 1,200 feet.
- Relocation of Taxiway B stub to meet design standards.

Manchester-Boston Regional Airport has completed a number of construction projects to enhance its customers' and employees' experiences at the Airport. These include a parking garage maintenance project and escalator replacement project. Some other improvement and development projects include:

30 An RPZ enhances the safety of the area beyond the end of the runway in the event of a landing or crash beyond the runway end. Only compatible land uses are permitted within an RPZ. Land uses prohibited from an RPZ include residences and places of public assembly.

- Cargo Facility Project where tenant Aeroterm will build a new cargo facility and Manchester-Boston Regional Airport will be responsible for constructing the new cargo apron that will connect the new facility to its airfield. Aeroterm has entered into a ground lease to develop a multitenant cargo facility at the Airport over the next three years. The FAA has also rewarded to the airport $7.9 million the help fund the facility as it is expected to support e-commerce demand.
- Restroom modernization project with new designs and technology to make the restrooms completely touch-free.
- Communications Center Modernization project where the plan is to expand the footprint of the existing Airport Communications Center by adding new technology and creating a new layout of the center that is more ergonomic.

Portland International Jetport (PWM)

Portland International Jetport, located in Portland, Maine, is owned by the City of Portland. Before the COVID pandemic, both passenger activity and operations increased each year between 2014 and 2019 with an increase in seat capacity from jetBlue Airways, United Airlines, Southwest Airlines, and Delta Air Lines. However, the passenger traffic had a dramatic decrease in 2020 because of the pandemic.

In 2018, Portland International Jetport published its Sustainable Master Plan. This master plan update was developed to "evaluate the airport's capabilities and role, to review forecasts of future aviation demand, and to plan for the timely improvement of facilities that may best meet that demand and maintain compatibility with the environs." The airport master plan is intended to "provide guidelines for the airport's overall development, maintenance, and operation for the next 20 years." In addition to new environmental goals, the plan outlines a program of airside and landside improvements, including new passenger gates, expansion of parking, enhanced aircraft parking and de-icing facilities, cargo, and GA improvements.[31]

Passenger and Operation Trends

Passenger activity at Portland International Jetport declined in 2020 due to the impact of the COVID pandemic with a drop of approximately 64 percent from 2019 levels reaching 0.79 million. However, the airport had a rapid recovery in 2021, with passenger traffic reaching 1.70 million (approximately 78 percent of 2019 levels) (**Table 4-2**). Overall, aircraft operations decreased to 39,328 in 2020 followed by an increase in 2021 to 53,741 which signifies more than 90 percent recovery as compared to 2019 operations levels .

Burlington International Airport (BTV)

Burlington International Airport, located in Burlington, Vermont, is owned by the City of Burlington. It is a joint-use civil-military airport. While Burlington International Airport experienced an overall increase in passenger traffic, operations, and available seat capacity from 2017 to 2019, the airport experienced a significant decrease in all passenger traffic in 2020 due to the COVID-19 pandemic, having declined 70.9 percent year-over-year. In August 2020, the airport celebrated its 100th anniversary.

31 Portland International Airport. Sustainable Airport Master Plan. 2018. https://portlandjetport.org/sites/default/files/files/PWM_MasterPlan_R.pdf

Burlington International Airport began the process of updating its Airport Master Plan, previously approved in 2012. The *2021 Master Plan Update*, which commenced in 2018 and was published[32] in 2021, provides an inventory of current facilities, presents forecasts of growth, assesses the need for additional development or rehabilitation of facilities, considers alternatives for future improvements, and provides a capital improvement plan (CIP). The Airport established two working committees that participated and guided the *2021 Master Plan Update* development, a Technical Advisory Committee and a Regional Advisory Committee. As outlined in the Master Plan's Financial implementation Analysis, funds sourced for the CIP will contribute to various short-term projects through 2025, a few of which include the terminal expansion and integration plan, South Apron expansion, a new glycol treatment system for the terminal apron, and better and improved passenger boarding, as well as commercial spaces.

Passenger and Operation Trends

Although the passenger activity at Burlington International Airport increased by approximately 11.7 percent from 2017 to 2018, and 4.3 percent in 2019, it witnessed a drastic decline in 2020 reaching 0.40 million and 0.60 million the following year. (**Table 4-2**). In 2020, total aircraft operations experienced a slump, decreasing 22.8 percent compared to 2019, resulting in 56,559 movements. Declines in commercial movements were a result of reduced Delta, jetBlue, and American Eagle frequencies to their hub markets (i.e., Atlanta for Delta, New York JFK for jetBlue, and Chicago O'Hare, Philadelphia, and Washington National for American Eagle). Total aircraft operations, however, increased in 2021 to 89,122, driven mainly by increased GA and military operations **(Table 4-3)**. Boutique Air introduced a new service to Logan Airport in 2021 while United and American Eagle introduced new but limited nonstop connectivity to Washington Dulles and Dallas/Fort Worth, respectively.

Bangor International Airport (BGR)

Bangor International Airport is located in Bangor, Maine and is owned by the City of Bangor. While Bangor International Airport's overall passenger activity remained fairly stagnant between 2018 and 2019, its total aircraft operations increased during the same time period, for each segment category (commercial, GA, and military). Both passenger activity and aircraft operations fell in 2020, by approximately 59 and 23 percent, respectively. However, in 2021, Bangor International Airport's seat capacity exceeded pre-pandemic 2019 levels by 7.4 percent. During that same year, American Airlines added new routes to Charlotte and Dallas/Fort Worth, and Delta Air Lines commenced Atlanta nonstop. In terms of infrastructure projects, there is a major runway rehabilitation project occurring at the airport.

Passenger and Operation Trends

Passenger activity at Bangor International Airport declined to 0.27 million passengers in 2020 from 0.65 million in 2019. The passenger traffic is steadily increasing with more than 75 percent recovery in 2021 as compared to 2019, reaching 0.50 million passengers. (**Table 4-2**). Overall, aircraft operations decreased to 34,946 operations from 45,600 operations in 2019 and revived to 42,939 in 2021. Bangor International Airport saw a gain in

32 Burlington International Airport. BTV Master Plan. 2021. https://btvmasterplan.com/public-information/.

military operations between 2019 and 2021, however GA and commercial remained below 2019 levels (**Table 4-3**).

Tweed-New Haven Airport (HVN)

Tweed-New Haven Airport, located in New Haven, Connecticut, is managed by a six-member board and is operated by the Tweed-New Haven Airport Authority. The passenger levels rose 22.7 percent in 2019 compared to the previous year, along with total frequencies, which grew 14.7 percent year-over-year. However, there was a stark decrease in passenger volumes of 75.8 percent in 2020 due to the pandemic. In November 2021, Avelo Airlines inaugurated operations to five destinations including Tampa, Fort Myers, Fort Lauderdale, Orlando, and West Palm Beach. Tweed-New Haven Airport has been established as the airline's main East Coast operating base. The airport also announced an expansion in 2021 which includes a new four-gate, 74,000 square-foot terminal and daily service from a new airline.

Passenger and Operation Trends

Passenger activity at Tweed-New Haven Airport decreased to 23,171 passengers in 2020 from 95,931 passengers in 2019 as American Eagle reduced its Philadelphia service by about two-thirds. The airport recovered nearly 60 percent in 2021 reporting 57,459 passenger via U.S. DOT T-100, which included Avelo Airlines passengers and primarily GA passengers (**Table 4-2**). The aircraft operations, however, increased from 28,430 in 2019 to 30,049 in 2020 and then 40,031 in 2021 (**Table 4-3**). The continuous increase in aircraft operations is mainly attributed by greater GA activity from 21,853 in 2019 to 36,025 in 2021, which represents an almost 165 percent increase compared to 2019 activity.

Portsmouth International Airport (PSM)

Portsmouth International Airport, located in Portsmouth, New Hampshire, is operated by the Pease Development Authority. There have been $85 million in airfield infrastructure improvements in the past 15 years and a newly reconstructed 5.3-acre terminal apron.

Passenger and Operation Trends

Passenger activity at Portsmouth International Airport decreased from 232,930 in 2019 to 79,919 in 2020, owing to the pandemic. Passenger volumes picked up to 145,426 in 2021, as scheduled and charter passenger activity recovered to 34.3 percent and 62.4 percent of 2019 levels in 2020 and 2021, respectively (**Table 4-2**). Although, total aircraft operations decreased not as significantly as other regional airports in 2020 to 38,553 (or negative 7.2 percent year-over-year compared to 2019), Portsmouth International Airport's 2021 operations exceeded 2019 levels by 51.9 percent, to 63,103 as compared to 41,545 operations in 2019 (**Table 4-3**). This was attributed by growth and recovery in GA operations and corporate travel demand. In terms of scheduled commercial services, Allegiant operated to three destinations in 2020, offering year-round nonstop service to both Punta Gorda and Orlando/Sanford, and provided summer seasonal flights to Myrtle Beach. In 2021, Allegiant dropped Myrtle Beach, and added seasonal services to Nashville and Tampa/St. Petersburg.

Local and Regional Long-Range Transportation Planning

A balanced regional intermodal transportation network reduces reliance on Logan Airport as the region's primary transportation hub and provides New England travelers with a greater range of viable transportation options. This section highlights efforts to promote an integrated, multimodal regional transportation network through cooperative transportation planning among transportation agencies and stakeholders.

Massport plays a fundamental role within the transportation systems of the Boston metropolitan area and New England and supports an integrated multimodal transportation policy to improve the efficient use of transportation infrastructure on both a metropolitan and a regional scale. Logan Airport functions as New England's premier commercial airport, providing an essential connection between the New England states and the global economy. Recent studies have indicated that there is a significant lack of usable aviation capacity in the coastal mega-regions[33] (although not in Boston itself) and identified a need for access to alternative forms of short-distance travel across these regions.[34]

Because the construction of a second major Boston airport has been deemed impractical, high-speed rail is increasingly viewed as a potential complement in the regional transportation system and aviation planning.[35] Given the comparable travel times, proximity of service to downtown Boston, and the potential for highly efficient electrified propulsion, high-speed rail could provide intercity connectivity for city-pairs in a corridor up to 600 miles long that would be competitive with air travel.[36] Boston's South Station is undergoing planning and design for expansion that would support current and future rail mobility in Massachusetts and along the Northeast Corridor (NEC), including future high-speed rail.

Boston and Statewide Long-Term Transportation Vision

The following sections describe long-term transportation initiatives that are part of the Boston and statewide transportation vision. Where applicable, these sections highlight Massport's commitment to and involvement in the regional transportation system.

Long-Range Transportation Plan of the Boston Region Metropolitan Planning Organization (MPO)

In August 2019, the Boston MPO adopted its current Long-Range Transportation Plan (LRTP), *Destination 2040*, to help the region address challenges related to increased congestion, stressed transportation infrastructure, and climate change to the long-term vitality of the region. New funding opportunities as part of *Destination 2040* includes transit modernization, dedicated bus lane infrastructure, and climate resiliency.

33 The coastal mega-regions are the continuously urbanized areas along the east and west coasts of the U.S. (Washington, D.C., Philadelphia, New York City, Hartford, and Boston).

34 Federal Aviation Administration. 2007. *Capacity Needs in the National Airspace System 2007-2025* (commonly referred to as FACT-2). https://www.faa.gov/airports/resources/publications/reports/media/fact_2.pdf; Transportation Research Board. 2010. *ACRP Report 31: Innovative Approaches to Addressing Aviation Capacity Issues in Coastal Mega-regions.* http://rsginc.com/files/publications/24.RSG_ACRP_Report31.pdf.

35 Transportation Research Board. 2015. *ACRP 03-23: Integrating Aviation and Passenger Rail Planning*. https://crp.trb.org/acrp0715/acrp-report-118-integrating-aviation-and-passenger-rail-planning/.

36 America 2050. 2009. *Where High-Speed Rail Works Best.* http://www.america2050.org/pdf/Where-HSR-Works-Best.pdf.

The plan focuses on six goals: safety; preservation of the existing system; capacity management/mobility; clean air/clean communities; transportation equity; and economic vitality. It envisions the use of new technology and prioritizes safety, equitable access, mobility, and varied transportation options.

The plan also envisions the Boston metropolitan region as a continuing economic, educational, and cultural hub that contributes to a high quality of life. A high quality of life is supported by a well-maintained transportation system with safe, healthy, affordable, efficient, and varied transportation options, which in turn increase access to educational opportunities, jobs, and services. Increased opportunities to use active or high-occupancy modes of transportation can also reduce emissions of greenhouse gases and other pollutants, improving air quality and reducing the overall environmental impact attributable to the transportation sector. This vision is possible through attentive maintenance, cost-effective management, and strategic investment in the region's transportation system. Public input through in-person and online public outreach are to be part of the process, where the MPO staff ask people about transportation needs and other inputs on proposed goals, projects and programs. Altogether, stakeholder needs are considered to shape the MPO's vision, described earlier, and to also identify capital investments and research studies to support that vision.

Between August and October 2020, the MPO approved a set of new policies to better define the types of large-scale projects that qualify for funding as part of the Major Infrastructure (MI) program. Going forward, projects funded under the MI program in the rolling five-year capital plan, Transportation Improvement, must meet at least one of the following criteria:

- Projects that improve facilities that are important to regional travel, which include Interstate Highways; Principal Arterial Freeways and Expressways; or all sections of roadways classified as Principal Arterial "Other" that have fully or partially controlled access.
- Projects that add new connections to or extend the rail or fixed guideway transit network or the bus rapid transit network.
- Projects that cost $50 million or more.

As a member of the MPO board, Massport is an active participant in the development of the Boston MPO's long-range transportation plan. The plan's vision is broad-based; more specifically for the Airport, the long-range vision finds that support for interconnected ground transportation systems and access to the Airport and air cargo are critical.

The next LRTP, *Destination 2050*, will be adopted in 2023. Destination 2050 will be deigned to address the forces and uncertainties that will shape the Boston region between the current environment and 2050.

Focus40

Focus40 is the 25-year investment plan for the Massachusetts Bay Transportation Authority (MBTA) to meet the needs of the Boston Region through the year 2040. The *Focus40* plan was released in draft form in March 2019 which considered inputs from stakeholder engagement that were updated and to be addressed in its final form. The plan considers all rapid transit, commuter rail, bus, ferry, and paratransit services.[37] The plan developed "a long-term investment strategy that recognizes both today's infrastructure challenges as well as

37 Transportation for persons with disabilities to supplement public transportation systems.

the shifting demographics, changing climate, and evolving technologies that may collectively alter the role the MBTA will play in the Greater Boston of the future."[38] To better plan for 2040 and given the onset of the COVID pandemic, the *Focus40* process considers what the world may look like in 2040. To address this, the MBTA looked at multiple potential scenarios of how the trends outside of its control, such as the speed and adoption of technology, the impact of climate change, municipal land use policies, demographic shifts, and mobility preferences, will take shape.[39] A list of the MBTA projects and planning efforts currently underway to position the MBTA to meet the needs of the Greater Boston region in 2040 can be found in the following link: http://www.mbta.com/projects/.

Other plans and processes that have informed *Focus40* include the following MassDOT/MBTA initiatives:

- 2019-2023 Capital Investment Plan;
- Better Bus Project;
- Commuter Rail Vision;
- Everett Transit Action Plan; and
- MBTA Strategic Plan.

Massport actively participated in the *Focus40* planning process to provide input on the role of Logan Airport and other Massport assets.

Massachusetts State Freight Plan

In 2016, MassDOT began the process of preparing a new, comprehensive *Massachusetts State Freight Plan* to look at the near-term and long-term vision for the freight system in Massachusetts. MassDOT released a final draft plan, which was approved by the Federal Highway Administration in 2017.[40] The new plan will include all freight modes, including air, rail, truck, and maritime. This plan will help document and guide Massport's freight planning work at Logan Airport, the Port of Boston, and Massport's other assets. The plan includes the designation of new miles of Critical Urban and Rural Freight Routes to the National Highway Freight Network, and improving connections to Logan Airport and Massport maritime facilities. The *Massachusetts State Freight Plan* will also assist in identifying cargo trends and supporting urban supply chains. For example, the *2010 Massachusetts State Freight Plan*[41] found that air freight shipping will grow more quickly than any other shipping mode. Massport was actively engaged in the *Massachusetts State Freight Plan* public process as a member of the leadership Freight Advisory Committee.

Massachusetts State Rail Plan[42]

In 2010, MassDOT developed the first State Rail Plan to guide planning and investment in freight, commuter, and passenger rail services across Massachusetts. The current plan, which was issued in Spring 2018, lays out a

38 MassDOT. 2022. *Focus40*. https://www.mbtafocus40.com/.
39 MassDOT. 2022. *Focus40*: Planning in the Face of Uncertainty. https://www.mbtafocus40.com/region-in-2040.
40 MassDOT. Rail and Transit Division, Freight Plan. https://www.mass.gov/service-details/freight-plan/.
41 MassDOT. September 2010. *State Freight Plan*. https://www.mass.gov/service-details/freight-plan.
42 MassDOT. 2018. *State Rail Plan*. https://www.mass.gov/service-details/rail-plan.

20-year vision and a four-year action plan describing policies, planning, infrastructure, and investment to guide the state's rail system. Massport advised and supported MassDOT on this plan.

Regional Cooperative Planning Efforts

Massport participates in regional transportation planning efforts, which are listed below.

New England Regional Airport System Plan (NERASP)[43] – Commercial Service Airports

In fall of 2006, the FAA New England Region, in concert with the New England Airport Directors and New England State Aviation Directors, completed the *NERASP*.[44] The results of this study describe the foundation of a regional strategy for the air carrier airport system to support the needs of air passengers through 2020. To date, the development of that strategy has been instrumental in facilitating the investment and development of the primary commercial airport system in New England.

New England Regional Airport System Planning – General Aviation (NERASP-GA)

While preparing the 2006 NERASP study, the group recognized that a similar evaluation of GA would provide a greater understanding of infrastructure investment, as well as a common understanding of state airport systems in relation to the New England region as a whole. New England and state aviation officials, in partnership with the FAA, conducted a study of the GA airport system in New England, which includes primary commercial service airports that provide a GA service component. Assisted by this information, the FAA will be better positioned to make decisions regarding priority capital investments in the context of rising airport and aircraft operational costs, declining operational activity, aging infrastructure, and limited state funds to address improvements. The 2015 study, *The Evolving Role of our General Aviation Airports and Their Significance to New England* can be found at https://www1.maine.gov/mdot/aviation/docs/neraspgasummarybrochure.pd.pdf.[45]

Local Planning Efforts

At a local level, Massport engages with municipalities, particularly the City of Boston, to coordinate on transportation planning and land use issues. Three recent plans, released by the City of Boston and discussed below, provide a relevant policy framework.

Imagine Boston 2030[46]

Imagine Boston 2030, the City of Boston's comprehensive plan, commenced in the fall of 2015 and was published in July 2017. This latest citywide plan provides a policy framework for future development in Boston, addressing key themes including: housing, mobility, climate adaptation, open space, equity, arts and culture, design and placemaking, health, and transportation. Many themes addressed in this plan will inform Massport's

43 Information on the NERASP-GA study can be found at https://www.faa.gov/airports/new_england/planning_capacity/airport_system_plan/.

44 The NERASP, which was published by the FAA in 2006, includes Logan International Airport and these 10 regional airports: Bangor International, Bradley International, Burlington International, Hanscom Field, Manchester-Boston Regional, Portland International, Portsmouth International, Rhode Island T.F. Green International Airport , Tweed-New Haven, and Worcester Regional airports.

45 The Evolving Role of our General Aviation Airports and Their Significance to New England - A Profile of the New England General Aviation Airports: Phase 1 Summary of Findings, September 2015, prepared for New England State Aviation Directors by Louis Berger, Airports Solutions Group, and ICF International.

46 City of Boston. *Imagine Boston 2030*. https://www.boston.gov/civic-engagement/imagine-boston-2030/.

planning efforts. At the same time, Massport continues to engage with the City of Boston and other stakeholders to shape the implementation of relevant strategies.

The document incorporated input from nearly 15,000 Boston voices and provided implementation planning leads (in the Appendix) that addressed initiatives for each theme. Altogether, the Boston Planning & Development Agency (BPDA) has pinpointed a physical location where *Imagine Boston 2030's* action areas and initiatives are to occur.[47]

GoBoston 2030

The City of Boston's long-range comprehensive transportation plan, *GoBoston 2030*, is intended as both a visioning and action plan to guide transportation planning policy and infrastructure investments through 2030. The plan, released in 2017, expresses three guiding principles: equity, economic opportunity, and climate responsiveness, as well as primary goals and aspirational targets. These targets include expanding access to transportation options, improving safety, reducing commute times, and promoting mode shift where all residents have better and more equitable travel choices. Below are the six identified aspirational targets set forth by the City:

- Improving safety (reduce and eliminate traffic fatalities and severe injuries in Boston);
- Expanding access (increase exposure of Bostonians to be within a 10 minute multimodal walkshed);
- Ensuring reliability (decrease average commute to work time by 10 percent);
- Reducing car use (reduce drive alone to work rates by 50 percent and increase transit use by 33 percent);
- Reducing emissions (carbon neutrality by 2050); and
- Increasing affordability (reduce transportation costs for low income households).

To meet these aspirational targets, the plan prioritizes capital investments in transportation improvements. Many of these transportation planning initiatives will impact Massport's facilities and include projects for which Massport is a key stakeholder.

As of May 2022, 30 projects are in implementation; 11 projects are in design; and 17 projects have not yet started. In 2019, the Transportation Department established its first ever Transit Team and in 2018, the City committed to a capital improvement project to improve street safety.

Climate Ready Boston

Climate Ready Boston is an ongoing initiative to guide Boston toward a more affordable, equitable, connected, and resilient future. Components of the Climate Ready Boston plan include: updating climate projections (e.g., extreme temperatures, sea level rise, flooding, and precipitation); completing vulnerability assessments; identifying impacts to focus areas; and creating more climate resiliency initiatives through policy, planning, and

47 Map of the planning initiatives set forth by the BPDA can be found via this link: http://www.bostonplans.org/planning/imagine-boston-2030-implementation/.

financial initiatives. Climate Ready Boston is coordinated with *Imagine Boston 2030* and *Go Boston 2030*. In December 2016, the study report was released and followed by neighborhood implementation strategies.

The City has developed a pilot tool to track its progress in implementing the citywide report recommendations from the Climate Ready Boston Outline of Actions.[48]

Conference of New England Governors (CONEG) and the Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP)

The CONEG is a formally established body that coordinates regional policy programs in the areas of economic development, transportation, environment, energy, and health, among others. The CONEG also provides secretarial support to the separate NEG/ECP. The latter coordinates policies of common interest across borders including infrastructure, energy, the environment, economic development, and trade. The CONEG offers a forum for policy on aviation and intercity passenger rail, particularly in the northeastern coastal mega-region, as part of a larger transportation system that needs modal balance. Efficient use of this multi-state network affects the overall viability of the highway, aviation, freight, and commuter rail transportation networks that serve the region and the nation. Improved planning coordination between airports and intercity passenger rail services and related ground transportation offers the potential to achieve complementary investments in airport and rail capacity and services.

MassDOT has a representative on the NEG/ECP Transportation and Air Quality Committee, which covers regional transportation issues and infrastructure development, use, and efficiency. The NEG/ECP and other policy decision makers throughout the region have been able to utilize strategies and information developed in the NERASP, which provides a framework for integrated regional aviation policy and planning. This organization helps to achieve a greater balance between air, rail, and auto trips, and ultimately increase overall transportation capacity without overburdening Logan Airport and the New England aviation system.

In 2015, the NEG/ECP passed and implemented the *Climate Change Action Plan,* which provided direction on reducing greenhouse gas emissions and a target range of at least 35 to 45 percent below 1990 levels by 2030.[49] Since 1973, the six New England states and the five Eastern Canadian provinces have worked cooperatively to address their shared interests across the border. Through the annual conferences of governors and premiers and discussions of joint committees, NEG/ECP encourages cooperation by:

- Implementing adaption strategies;
- Building resilience into infrastructure;
- Developing networks and relationships;
- Taking collective action;
- Engaging in regional projects;
- Undertaking research; and

48 City of Boston Progress Summary & Details. 2022. https://www.boston.gov/departments/environment/climate-ready-boston-progress/.

49 Conference of New England Governors and Eastern Canadian Premiers. August 30, 2015. *Resolution 39-1, Resolution Concerning Climate Change*.

- Increasing public awareness of shared interests.

Among the topics recently addressed by the governors and premiers are:

- Ensuring a clean, efficient, and reliable energy future for the region;
- Invoking energy innovation for a competitive economy via energy diversification and storage;
- Changing global energy markets and the region's energy landscape;
- Encouraging business-to-business programming;
- Cross-border partnerships for economic development and trade liberalization;
- Transportation and air quality;
- Climate change action plans and greenhouse gas emission reduction strategies;
- Energy-efficient vehicle and infrastructure technologies; and
- Cross-border mutual aid in emergency planning.[50]

Regional Rail Transportation Initiatives

This section reports on recent developments and current rail service originating in Boston, the status of air-rail linkages in the NEC, and the expanding Pilgrim Partnership, which provides commuter rail between Massachusetts and Rhode Island. While information in the following subsections reflects conditions as of 2021, current conditions and ridership may differ because of service adjustments and changes in demand due to the COVID pandemic.

Amtrak Northeast Corridor (NEC)

Amtrak's NEC is an intercity rail line that operates between Boston-South Station and Washington, D.C. via New York City. Other major destinations served by the route include Providence, Rhode Island; New Haven, Connecticut; Philadelphia, Pennsylvania; and Baltimore, Maryland. Logan Airport passengers can connect directly to Boston-South Station via Silver Line bus rapid transit (BRT) service or via taxi or other unscheduled mode. Amtrak operates two services between Boston and Washington, D.C.: the Acela Express (high-speed, limited-stop service) and the Northeast Regional (lower-speed service that makes local stops along the route). Travel times on the Acela Express range from approximately 3.75 hours from Boston to New York to approximately 6.75 hours from Boston to Washington, D.C. Travel times on the Northeast Regional range from about 4.25 hours from Boston to New York to approximately 8.00 hours from Boston to Washington, D.C. On weekdays, a total of 18 daily departures are offered from Boston-South Station to New York-Penn Station, of which about half are Acela Express. On Saturdays and Sundays, a total of 12 departures and 14 departures are offered from Boston-South Station to New York, respectively.[51] Most trips continue south to Washington, D.C, and a smaller number of Northeast Regional trains continue further south to Central and Eastern Virginia.

50 Coalition of Northeastern Governors. 2019. *New England Governors/Eastern Canadian Premiers*. http://www.coneg.org/negecp.

51 Amtrak. 2022. Train Schedules and Timetables. https://www.amtrak.com/train-schedules-timetables.

System-wide Amtrak ridership was 16.8 million trips in FY 2020 and 12.2 million trips in FY 2021.[52, 53] In FY 2020, the NEC carried 6.1 million trips on its Acela Express and Northeast Regional services, down about 51 percent from FY 2019. Acela Express accounted for nearly 1.7 million trips, while the Northeast Regional accounted for approximately 4.4 million trips. In FY 2021, the NEC carried 4.4 million trips on those services, down about 28 percent from the prior year. Acela Express accounted for nearly 0.9 million trips, while the Northeast Regional accounted for approximately 3.5 million trips. Amtrak's share of the Northeast total passenger market has increased substantially since the introduction of Acela Express service in 2000. This share may rise as Amtrak introduces new rail cars into service over the next few years, replacing the old "Amfleet I" cars on the NEC with contemporary rail equipment.[54] Amtrak will also introduce next-generation Acela rail cars (scheduled to enter service in 2023), which will increase the number of seats per train by approximately 25 percent.[55]

Northeast Corridor Capital Investment Program, Next-Generation High Speed Rail Plan, and Connect NEC 2035

The *Northeast Corridor Infrastructure Master Plan*, a regional rail planning study, was released in May 2010. The Master Plan[56] documents NEC growth needs through 2030, including expanded capacity and improvements in Boston-New York and New York-Washington intercity travel times. Forecasted growth and corresponding investment needs over the 20-year study period include: a 76 percent increase in rail ridership from 13 million to 23 million,[57] a 36 percent increase in train movements from 154 average weekday to 210 average weekday, and $52 billion in additional capital investment.

To follow up on the release of the *Northeast Corridor Infrastructure Master Plan*, Amtrak also unveiled a next-generation high-speed rail proposal in September 2010, titled *A Vision for High-Speed Rail in the Northeast Corridor*. The proposal outlines a brand-new 427-mile two-track corridor running from Boston to Washington, D.C, offering high-speed rail service with sustained maximum speeds of 220 mph. Operations simulations estimate 83-minute trip times between Boston and New York by 2040 and 3-hour and 23-minute trip times between Boston and Washington, D.C. Under this next-generation high-speed rail plan, the New York City – Boston market would see a further shift in demand from auto and air to rail due to the dramatic improvements in rail travel times, and the air market between the two city-pairs is projected to be nearly eliminated by 2050.[58] This plan states that traveler's shift to high-speed rail would reduce delays on competing modes (air and auto) and the shift away from shorter and smaller intraregional flights would free up air transport capacity for higher-value transnational and international flights.[59]

52 Amtrak. *FY 2021 Company Profile.* https://www.amtrak.com/national-facts.

53 Amtrak. *FY2020 Company Profile.* https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/nationalfactsheets/Amtrak-Company-Profile-FY2020-041921.pdf

54 Amtrak. "*Amtrak Five Year Equipment Asset Line Plan: Base (FY 2019) + Five Year Strategic Plan (2020-2024),*" https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/businessplanning/Amtrak-Equipment-Asset-Line-Plan-FY20-24.pdf.

55 Amtrak. "The Next Generation of Acela," https://www.amtrak.com/next-generation-acela-express.

56 The NEC Master Plan Working Group. 2017. *The Northeast Corridor Infrastructure Master Plan*. https://railroads.dot.gov/elibrary/northeast-corridor-infrastructure-master-plan

57 Includes ridership on Amtrak and state rail lines but excludes ridership on commuter rail lines.

58 Amtrak. September 2010. *A Vision for High-Speed Rail in the Northeast Corridor*. amtrak-vision-for-the-northeast-corridor-july-2012.pdf

59 *Ibid.*

An update to the *Northeast Corridor Infrastructure Master Plan* and *A Vision for High-Speed Rail in the Northeast Corridor* was released in July 2012. Since these two documents were released, the two programs have been integrated into a single coherent service and investment program, called the Northeast Corridor Capital Investment Program. The Northeast Corridor Capital Investment Program would advance the near-term projects outlined in the Master Plan to benefit the NEC, while incrementally phasing improvements to the Acela Express high-speed service to support the proposed next-generation high-speed rail.[60] The near-term NEC improvements, which include new equipment for high-speed trainsets, are identified to occur between 2012 and 2025, and the long-term Next-Generation High-Speed Rail improvements are identified to occur between 2025 and 2040. The publication of the 2012 update is the first step in "improving the NEC for all users in order to sustainably support the population and economic growth facing the Northeast over the next 30 years," but a considerable amount of additional planning work is required by all stakeholders.[61]

The Federal Railroad Administration (FRA) prepared a comprehensive plan for the NEC, entitled NEC FUTURE. The FRA has worked closely with NEC states, railroads, stakeholders, and the public to define a long-term vision for the corridor's future. In July 2017, the FRA issued the Record of Decision for NEC FUTURE, which describes the vision.[62] The FRA will work with the NEC Commission, as well as states and railroads, on service development planning in support of this vision. Released in 2021, *Connect NEC 2035* (C35) is the most recent reinvestment program for the NEC, and advances the first phase of the NEC FUTURE plan. C35 includes a 15-year service development and infrastructure plan and aims to address the NEC's backlog of state-of-good-repair needs while planning for future expansion and growth through a detailed sequence of infrastructure investments. The total investment needed for C35's 15-year program is approximately $117 billion dollars in 2020.[63]

In 2017, the Rhode Island Department of Transportation (RIDOT) and Amtrak completed work on the Kingston Station Capacity Expansion project. The project included construction of a third track at Kingston Station, enabling higher speed Acela trains to safely bypass regional trains.[64] The project supports improvements to train operations and the passenger experience along the Rhode Island stretch of the Northeast Corridor.

RIDOT was awarded a FRA State of Good Repair Grant to make improvements to Providence Station. RIDOT and Amtrak are currently collaborating to advance design plans and begin construction. This project is set to be completed in 2024.[65]

Northern New England Intercity Rail Initiative

Completed in 2016, the Northern New England Intercity Rail Initiative is an interstate, interagency collaboration between MassDOT, the Vermont Agency of Transportation, and ConnDOT "to examine the benefits, opportunities, and impacts of more frequent and higher speed intercity passenger rail service on two major rail

60 Amtrak. July 2012. *The Amtrak Vision for the Northeast Corridor: 2012 Update Report*. amtrak-vision-for-the-northeast-corridor-july-2012.pdf

61 *Ibid.*

62 Available online at: https://www.fra.dot.gov/necfuture/project_docs/reports.aspx.

63 Northeast Corridor Commission. July 2021, *CONNECT NEC 2035 PLAN*. http://nec-commission.com/connect-nec-2035/#download

64 Amtrak. *Kingston Station Capacity Expansion.* https://nec.amtrak.com/content/kingston-station-capacity-expansion.

65 RIDOT. Providence Station State of Good Repair Project. https://www.dot.ri.gov/projects/PVDStation/index.php

corridors."[66] The studied corridors are the Inland Route (between South Station and Western Massachusetts via Worcester and Springfield) and the Boston to Montreal Route. The study evaluated ridership, environmental impacts, and service plans of the 470 miles along these two corridors.

Boston-South Station Expansion

In support of the Northeast Corridor Capital Investment Program, MassDOT is planning to expand Boston's South Station Rail Terminal capacity and related layover capacity to meet current and anticipated future (2035) high-speed, intercity, and commuter rail services needs on the NEC and on the MBTA's South Side commuter rail system. At present, South Station operates above its design capacity for efficient train operations and orderly passenger queuing. Operating with only 13 tracks, South Station constrains the current and future rail mobility within Massachusetts and throughout New England and the NEC.[67] The proposed South Station Expansion Project will result in a number of benefits to rail mobility, including:[68]

- Growth in passenger rail transportation along the NEC and within Massachusetts;
- Improved service reliability through updates to rail infrastructure and related layover capacity;
- Improved passenger capacity and experience of using South Station;
- City-building in a key area of Boston; and
- Reopening of Dorchester Avenue for public use and enjoyment for the first time in decades.

The Massachusetts Environmental Policy Act (MEPA) environmental review process for this project concluded with the issuance of a Secretary's Certificate on August 12, 2016 on the Final Environmental Impact Report (FEIR).[69] The National Environmental Policy Act (NEPA) environmental review process for this project concluded with the issuance of a Final Environmental Assessment (EA) and Section 4(f) Determination, and Finding of No Significant Impact (FONSI), on October 27, 2017.[70] Prior to issuance of the Final EA, FRA and MassDOT had collected comments on the Draft EA and Draft Section 4(f) Determination for a 30-day public comment period, which concluded May 27, 2017. The draft document was circulated to agencies, project stakeholders, and individuals on the project distribution list for review and comment. Written responses to comments were provided in the FONSI.

In August 2019, the U.S. DOT awarded MassDOT a grant to improve South Station's Tower 1 interlocking, critical infrastructure that distributes trains to and from the station.[71] This early action project will provide immediate operating benefits once completed and will improve reliability and resiliency.

66 MassDOT. Northern New England Intercity Rail Initiative. https://www.mass.gov/files/documents/2018/05/24/NNEIRI_StudySummary.pdf

67 MassDOT. *About this Project.* https://www.mass.gov/lists/south-station-expansion-documents.

68 MassDOT. October 2017. *South Station Expansion Final Environmental Assessment and Section 4(f) Determination.* https://www.mass.gov/lists/south-station-expansion-final-environmental-assessment.

69 MassDOT. June 2016. *South Station Expansion Final Environmental Impact Report.* https://www.mass.gov/lists/south-expansion-final-environmental-impact-report.

70 MassDOT. October 2017. *South Station Expansion Final Environmental Assessment and Section 4(f) Determination and Finding of No Significant Impact.* https://www.mass.gov/lists/south-station-expansion-documents.

71 MBTA. *South Station Tower One Interlocking Project.* https://www.mbta.com/projects/south-station-tower-one-interlocking-project .

Separate from the South Station Expansion Project, the station is currently undergoing improvements as part of the South Station Air Rights Project. Through a collaborative effort between BPDA, the private developer, and the MBTA, this project will improve South Station's rail and bus terminals in addition to constructing a new tower with office and residential space. Once complete, the improvements will expand the outdoor Commuter Rail concourse area, increase bus terminal capacity by more than 50 percent, and provide more convenient connections between the bus and rail terminals. Construction began in early 2020 with projected completion in 2025.[72]

North-South Rail Link

Boston is served by two commuter rail systems, one extending to the north of the city, the other to the south. They are disconnected from each other, limiting north to south connectivity for the MBTA commuter rail system as well as Amtrak's intercity rail system. The North-South Rail Link is a proposed pair of rail tunnels that would connect North and South Stations in downtown Boston. MassDOT completed a Draft Environmental Impact Report (DEIR) between 1995 and 2003, but the project was not pursued at that time. MassDOT recently completed a Feasibility Reassessment for the North-South Rail Link Project to update the prior work and inform MassDOT's and state policy makers' decisions about appropriate next steps for the proposed project. The North-South Rail Link Feasibility Reassessment Final Report was released in January 2019.[73]

East-West Passenger Rail Study

MassDOT conducted a study to examine the costs, benefits, and investments necessary to implement passenger rail service from Boston to Springfield and Pittsfield, with the speed, frequency, and reliability necessary to be a competitive option for travel along this corridor. The study assessed six alternatives, which featured a range of approaches including high speed rail and potential infill stations.[74] MassDOT released the final study report in January 2021. In November 2021, MassDOT released the Massachusetts Intercity Rail Governance White Paper to understand governance options for passenger rail in Western Massachusetts.

Commuter Rail Services

The Pilgrim Partnership is an arrangement between the MBTA and RIDOT, under which RIDOT allocates some of its federal funding to the MBTA in return for commuter rail service between Boston and Rhode Island, and new equipment purchases and improvements to facilities in Massachusetts. The Pilgrim Partnership provides residents in the greater Boston area with improved access to jobs located in Providence. On weekdays, 20 round trips are provided between Boston and Providence. On weekends, nine round trips are provided between Boston and Providence.[75] Expanded weekday commuter rail service to Rhode Island T.F. Green International Airport in Warwick, Rhode Island was introduced in December 2010, which provides more options for inter-city travel for Boston residents and costs passengers $12.75 each way. Travel time between Boston and Warwick is approximately 1.3 to 1.7 hours. On weekdays, 10 of the 20 daily outbound trips from Boston to Providence currently continue to Warwick as well as Wickford, Rhode Island. Expanded weekday service to

72 MBTA. *South Station Transportation Center Improvements.* https://www.mbta.com/projects/south-station-transportation-center-improvements

73 Available online at: https://www.mass.gov/lists/north-south-rail-link-feasibility-reassessment-study-documents.

74 Available online at https://www.mass.gov/east-west-passenger-rail-study.

75 MBTA. 2022. Providence/Stoughton Timetable. https://www.mbta.com/schedules/CR-Providence/timetable?date=2022-0821&schedule_direction%5bdestination%5d=&schedule_direction%5bdirection_id%5d=0&schedule_direction%5borigin%5d=

Wickford, Rhode Island commenced in 2012, with a potential extension further into South County as service in the state expands and ridership grows. Additionally, RIDOT, in cooperation with the City of Pawtucket, is currently investing in construction of a $63 million (partially federally funded) new commuter rail station in Pawtucket, Rhode Island, which will serve MBTA commuter trains. Construction for this project is ongoing and scheduled to open at the end of 2022.[76]

The expansion of commuter rail service into Rhode Island enhances ground access options from the Boston metropolitan area to Rhode Island T.F. Green International Airport. The passenger catchment areas of Rhode Island T.F. Green International Airport and Logan Airport overlap, and this commuter rail service has the potential to attract passengers in the overlapping catchment area who live along the MBTA's Providence Line to Rhode Island T.F. Green International Airport.

Massachusetts officials cleared funding hurdles in April 2019 to begin expansion of MBTA commuter rail service to major cities like New Bedford and Fall River (located within approximately 50 miles of Boston and without regular commuter rail service to the capital) via the South Coast Rail corridor. This two-phase, $3.42-billion construction will extend the existing Middleborough Line from Boston and bring six new stations and two new layover facilities, with a target date for operational service for Phase 1 ($1.05 billion) by late 2023.[77] The first phase includes reconstruction of existing tracks and upgrades to the Middleborough Secondary track. The second phase of the project will provide service to the South Coast through the Town of Stoughton. Phase 1 service is currently scheduled to begin in 2023, with remaining portions of the project expected to reach completion with the implementation of the Full Build.[78]

In October 2019, the MBTA launched a one-year pilot to test weekday commuter rail service to Foxboro. The MBTA operated 10 daily round-trips as part of the Service Pilot, with 500 parking spaces available at Foxboro Station. The MBTA suspended the service pilot in 2020 as part of service changes across the commuter rail system as a result of the COVID pandemic. This pilot was relaunched in 2022.

MBTA Rail Vision

The MBTA's Rail Vision planning study identified cost-effective strategies to transform the MBTA's existing Commuter Rail system to better support improved mobility and economic competitiveness in the Boston region. The study evaluated how best to serve riders and determined which investments support the final vision. The project identified and evaluated six alternatives for a future MBTA rail system to understand the costs, ridership potential, and operational feasibility of these alternatives. The results of this evaluation were presented at a public meeting in late 2019, and the Rail Vision study was completed in early 2020.[79] While the study was completed pre-pandemic and reflects pre-pandemic mobility patterns, the MBTA has advanced planning for elements of a Regional Rail Transformation. The Regional Rail Transformation has resulted in schedule changes beginning in spring 2021 to implement all-day bi-directional service on all lines, and hourly

76 RIDOT. *Pawtucket/Central Falls Transit Center*. http://www.dot.ri.gov/projects/PCF/index.php.

77 Chris Lisinski, State House News Service, for WBUR. 2019. "Permit, Funding Hurdles Cleared for South Coast Rail." https://www.wbur.org/bostonomix/2019/04/23/south-coast-commuter-rail-permit-funding.

78 MassDOT. *South Coast Rail.* https://www.mass.gov/south-coast-rail.

79 MBTA. Rail Vision. https://www.mbta.com/projects/rail-vision.

clock face service on some lines. The Regional Rail Transformation has also continued planning for "No Regrets" investments and electrification of some parts of the system. [80]

Other Regional Cooperative Planning Efforts

Recognizing that Logan Airport is a substantial trip generator and key transportation resource in the metropolitan area, Massport participates in several interagency transportation planning forums that strive to enhance a variety of travel modes.

South Boston Waterfront Transportation Plan

Massport, the City of Boston, MassDOT, and the Massachusetts Convention Center Authority all participate in and manage the new sustainable transportation plan for the South Boston Waterfront. The resulting plan, featuring an unprecedented collaboration of the private and public sectors, is a blueprint for improving the growth of the Waterfront, proposing solutions to meet the growing and changing transportation needs of the district, and improving the public realm of the area, all while preserving the quality of life for the surrounding neighborhoods. The plan benefitted from the input of area stakeholders through five community meetings and more than 50 outreach meetings throughout the process. Massport continues to engage in implementation of recommendations from this plan, in collaboration with other agency partners.

The City of Boston published the *Coastal Resilience Solutions for South Boston* report in October 2018. This plan presents near-term and long-term visions for reducing risk due to sea level rise and coastal flooding in South Boston. This is the second neighborhood coastal resilience plan to come out of the Climate Ready Boston initiative.

In Spring 2019, the City of Boston, jointly led by the BPDA and the Boston Transportation Department, is developing the *South Boston Strategic Transit Plan* to improve the operations, capacity and connectivity of the transit network serving the South Boston Seaport. Virtual meetings have been held through 2022, where plan recommendations and received feedback are presented. Massport, along with other partner agencies including the MBTA, MassDOT, Massachusetts Convention Center Authority and Seaport Transportation Management Association (TMA) are key team members with roles in implementing the recommendations for the anticipated rapid growth in the Seaport District (residential, commercial and institutional destinations).

Water Transportation Advisory Council and Ferry Study

Massport participates in planning for water transportation in the Boston region as a member of the Water Transportation Advisory Council, convened by MassDOT. Massport also participated in a comprehensive study of commuter, recreational, and landside access needs to support water transportation in Boston Harbor, which was completed in April 2019. The study identified three potential corridors for water transportation service and developed business plans to assess ridership and implementation feasibility. Massport served on the steering committee for this study led by Boston Harbor Now with support from MassDOT and other stakeholders.

80 MBTA. *Regional Rail Transformation Update.* June 23, 2022.

Boston MPO

Massport supports multimodal transportation planning and improved integration of its facilities with Boston area transportation through its permanent voting membership on the Boston MPO and by providing input on the Boston MPO's policy and programming decisions.

MPOs are established in large metropolitan areas and are responsible for conducting a federally required cooperative, comprehensive, and continuous metropolitan transportation planning processes. Based on this planning, MPOs determine which surface transportation system improvements will receive federal capital (and occasionally, operating) transportation funds. The Boston MPO´s mission is to establish a vision and goals for transportation in the region and then develop, evaluate, and implement strategies for achieving them.

Massport plays an active role on the MPO's decision making board, participating in policy decisions related to the *Long-Range Regional Transportation Plan,* and project programming for the Transportation Improvement Program. The MPO also guides the work conducted by Central Transportation Planning Staff (CTPS) via its Unified Planning Work Program. CTPS also supports Massport's ground transportation planning initiatives.

Metropolitan Area Planning Council (MAPC) Metro Future/MetroCommon

Massport is also an ex-officio member of the Executive Committee of MAPC, a regional planning agency that serves the people who live and work in the cities and towns of Metropolitan Boston. The MAPC mission is to promote smart growth and regional collaboration, which includes protecting the environment, supporting economic development, encouraging sustainable land use, improving transportation, ensuring public safety, advancing equity and opportunity among people of all backgrounds, and fostering collaboration among municipalities. MAPC membership includes 101 municipal government representatives, 21 gubernatorial appointees, 10 state officials (including Massport), and three City of Boston officials. A staff of approximately 40 individuals supports the Council and its Executive Committee of 25 selected members.

MetroFuture is a 30-year plan to better the lives of the people who live and work in Metropolitan Boston which calls for smart growth and regional collaboration. The MAPC was awarded a $4 million Sustainable Communities Grant from the U.S. Department of Housing and Urban Development in 2010 to support implementation of *MetroFuture* through local planning efforts, tools and data, and capacity building for local residents and leaders. As of 2021, a new regional plan is in the process of being updated called *MetroCommon 2050*. Building upon the existing plan, *MetroCommon* will require focused efforts to enact change in five, interrelated topics ("Action Areas") which include: [81]

- Inclusive Growth & Mobility;
- Homes for Everyone;
- Equity of Wealth & Health;
- Dynamic & Representative Government; and
- Climate Change Mitigation & Resiliency.

81 Metropolitan Area Planning Council, MetroCommon x 2050. https://metrocommon.mapc.org/.

Governor's Commission on the Future of Transportation

Signed in January 2018, Executive Order No. 579 established the Commission on the Future of Transportation in the Commonwealth to advise on future transportation needs and challenges. The Commission will explore anticipated changes in technology, climate, land use, and the economy to determine likely impacts on transportation between 2020 and 2040. This work is being conducted through the development of future scenarios and formulation of recommendations for the Governor, Lieutenant Governor, and other key decision makers. The Commission met monthly and provided a report by December 2018 on the analysis of members and made recommendations to help the administration tackle dynamic issues facing the Commonwealth. The Commission made 18 recommendations grouped into five thematic categories for how to best prepare Massachusetts' transportation volume for 2040. The five key areas[82] are listed below:

- Modernize existing state and municipal transit and transportation assets to more effectively and sustainably move more people throughout a growing Commonwealth;
- Create a 21st century "mobility infrastructure" that will prepare the Commonwealth and its municipalities to capitalize on emerging changes in transportation technology and behavior;
- Substantially reduce greenhouse gas (GHG) emissions from transportation sector in order to meet Commonwealth's Global Warming Solutions Act (GWSA) commitments, while also accelerating efforts to make transportation infrastructure resilient to a changing climate;
- Coordinate and modernize land use, economic development, housing, and transportation policies and investment in order to support resilient and dynamic regions and communities throughout the Commonwealth; and
- Make changes to current transportation governance and financial structures in order to better position Massachusetts for the transportation system that it needs in the next years and decades.

The second volume of the report also represented 10 months of research, learning from a range of academic, industry, and advocacy sources. The report detailed demographic, social, technology, and climate-related trends which branched to include Active Transportation, Mobility Services, Autonomous and Connected Vehicles, Climate Change and Resilience, and Transportation Electrification.

82 Mass.gov, Governor's Press Office. 2018. https://www.mass.gov/orgs/commission-on-the-future-of-transportation/.

This Page Intentionally Left Blank.

5

Ground Access to and from Logan Airport

This *2020/2021 Environmental Data Report (EDR)* was filed during the recovery of the COVID-19 worldwide pandemic. Flights in and out of Boston Logan International Airport (Logan Airport or the Airport) were dramatically reduced and 2020 passenger levels dropped over 70 percent when compared to 2019. As a result, there were far fewer aircraft operations and passengers and a dramatic drop in overall Logan Airport activity during that time. While activity levels began a slow recovery in late 2020, the ongoing waves of COVID-19 cases have resulted in continued low levels of activity, with a full recovery not expected in the near term. As of the end of December 2021, passenger levels were still about 47 percent lower than 2019 pre-pandemic levels.

During 2020 and 2021, the pandemic effects resulted in fewer passengers and employees traveling to and from Logan Airport and less roadway congestion both in Boston and the metropolitan area. In addition, the public's interest in using high-occupancy vehicle (HOV) transportation services like buses, rapid transit and commuter rail, is still diminished by concerns about COVID-19 and reduced service or service disruptions. Within that context, Massport continues to evaluate and plan for the recovery of air passenger activity and remains committed to implementing the broad range of ground access and trip reduction strategies that are outlined throughout this chapter. Massport continues to carefully review both on and off-Airport activity levels and will adjust its ground access programs to align with air passenger levels. The schedule for HOV and ground access improvements have and will continue to be adjusted due to current conditions. Massport remains committed to implementing project-related mitigation strategies, as documented in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*.

Key Findings for 2020 and 2021

- Post pandemic, it is anticipated that Boston Logan International Airport (Logan Airport or the Airport) will continue to be one of the top U.S. airports in terms of high-occupancy vehicle (HOV) and transit mode share. Massport remains committed to promoting numerous HOV, transit, and shared-ride options to improve on-Airport roadway and curbside operations, alleviate constraints on parking, and improve customer service. Key initiatives include:
  - Continuing to promote Logan Express ridership by expanding parking, frequency, and facility upgrades;
  - Massport is purchasing eight Massachusetts Bay Transportation Authority (MBTA) Silver Line buses as part of a forthcoming (spring 2023) MBTA procurement; and
  - Implementation of a RideApp (e.g., Uber and Lyft, previously referred to as transportation network companies [TNCs]) management plan to reduce congestion on-Airport, including a focus on ride rematch[1] and shared-ride.

- Average weekday on-Airport vehicle miles traveled (VMT) decreased by about 75 percent from approximately 209,900 in 2019 to 52,794 in 2020. Between 2020 and 2021, average weekday on-Airport VMT increased to 118,937. The change in average daily traffic in 2021 can be attributed primarily to a post lock-down rebound in air passenger activity, increase in passenger drop-off/pick-up, cargo, and non-aviation related Airport uses. Based on more recent data, Airport activity and on-Airport VMT is trending higher in 2022 due to the reduction in air travel restrictions and social distancing impacts of COVID-19. A new air passenger survey conducted in 2022 will provide early post-pandemic trends related to HOV mode shift. Results of the air passenger survey will be presented in the *2022 Environmental Status and Planning Report (ESPR)*.

- RideApp transactions dropped significantly from more than 7 million in 2019 to just over 2 million in 2020 due to travel restrictions from COVID-19 and potential health safety concerns associated with sharing vehicles. As passenger levels increased in 2021, the number of rideshare users also increased. However, the number of riders is still significantly lower than pre-COVID (2019 and prior) levels.

- Due to the impacts of COVID-19, the number of black car limousines and scheduled van seats coming to the Airport dropped by nearly 64 percent from 2019 to 2021. Taxi dispatches declined about 80 percent in 2020 compared to 2019 and increased by about 66 percent between 2020 and 2021. MBTA Blue Line ridership decreased by approximately 58 percent between 2019 and 2020 but increased in 2021 compared to 2020.

- In 2017, the Logan Airport Parking Freeze was amended to allow for an increase of up to 5,000 on-Airport commercial parking spaces, which was the first step in allowing for the construction of additional parking to reduce drop-off/pick up modes and alleviate constrained on-Airport parking conditions. In January 2020, Massport received the Final Environmental Impact Report (FEIR) certificate from the Secretary of the Executive Office of Energy and Environmental Affairs (EEA), completing the environmental review process for the construction of 5,000 additional parking spaces. While the project has completed the environmental review process, construction of these additional parking spaces has been deferred.

- Massport has a goal of reaching 35.5 percent HOV mode share by 2022 and 40 percent by 2027. Based on the results of the *2019 Logan International Airport Air Passenger Ground-Access Survey*, HOV mode share reached 40.4 percent, exceeding both near-term and longer-term goals. COVID-19 has had a range of impacts on ground transportation, particularly on the use of ground-access HOV modes. While it is anticipated that the HOV mode share will drop as a result of COVID-19 over the short term, Massport is striving towards the HOV mode share goals going forward.

Introduction

Massport has a comprehensive, multi-pronged, trip reduction strategy to diversify and enhance ground transportation options for passengers and employees traveling to and from Logan Airport. The ground transportation strategy is designed to offer passengers traveling to and from Logan Airport with a choice of HOV, transit, and shared-ride options that are convenient and reliable, and that reduce environmental and community impacts.

The strategy also aims to provide sufficient on-Airport parking for air passengers choosing automobile access modes and/or who have limited HOV options. Improving the multimodal connectivity of the Airport can provide traffic congestion and environmental benefits by reducing vehicle trips, vehicle miles traveled (VMT), and greenhouse gas (GHG) emissions associated with travel to and from Logan Airport. The cost, speed, convenience, safety, and reliability of all modes of transportation connecting to the Airport affect how passengers and employees choose among these access modes. Offering a range of ground access options also improves customer service for air passengers, employees, and other Airport users.

Along with reducing congestion and limiting impacts to the environment:

- Massport continues to invest in and operate Logan Airport with a goal of increasing the HOV mode share—the number of passengers (and Airport employees) arriving by transit or other HOV and shared-ride modes. Measures implemented by Massport to increase HOV use include initiatives related to pricing (incentives and disincentives), service availability, service quality, infrastructure improvements, marketing, and traveler information.
- Massport aims to reduce the total number of vehicles that access Logan Airport and, in particular, reduce the associated environmentally undesirable drop-off/pick-up modes, which generate up to four vehicle trips instead of two and contribute to greater terminal area roadway congestion.[2]
- Massport actively manages parking supply as another strategy to reduce drop-off/pick-up modes by promoting long-term rather than short-term parking (thus reducing the number of daily trips to Logan Airport); supporting efficient use of parking facilities; providing good customer service; and complying with the provisions of the Logan Airport Parking Freeze.[3]

In addition to highlighting more recent changes to ground transportation services, operations, and pricing, this chapter reports on ground access conditions and activity levels in 2020 and 2021, which are compared to past conditions. Activity levels include measures of ridership on various ground access modes and traffic volumes. The chapter provides an overview of parking demand and its impacts under Logan Airport's constrained parking supply. Regional transportation efforts related to the Airport, as well as planning efforts

1 Rematch allows drivers who are dropping off to immediately pick up another passenger without needing to circle the Airport or leave without one or more passengers.

2 If an air passenger is dropped off when departing on an air trip and is picked up upon return, that single air passenger generates a total of four ground access trips: two for the drop-off trip (one inbound to Logan Airport, one outbound from Logan Airport) and two for the pick-up trip (one inbound to Logan Airport, one outbound from Logan Airport). The air passenger may be dropped off and picked up in a private vehicle, taxi, RideApp, or a black car limousine and the vehicle may not carry a passenger during all segments of travel to and from Logan Airport.

3 310 Code of Massachusetts Regulations 7.30; 40 Code of Federal Regulations 52.1120.

to diversify transportation options in the New England region (primarily through high-speed, commuter, and passenger rail), are discussed in Chapter 4, *Regional Transportation*.

Ground Transportation Modes of Access to Logan Airport

The Logan Airport EDRs and Environmental Status and Planning Reports (ESPRs) provide over four decades of tracking and reporting on ground access and ground transportation at the Airport. Air passengers have a variety of options for getting to Logan Airport, including:

- Public transit (Massachusetts Bay Transportation Authority [MBTA] Blue Line subway, Silver Line bus rapid transit, other MBTA buses, and water transportation);
- Logan Express scheduled bus service;
- Scheduled buses and vans;
- Courtesy shuttle buses;
- Charter buses;
- Private automobiles;
- Unscheduled private black car limousines and vans;
- Taxis;
- Rental cars; and
- RideApps, such as Uber and Lyft.

Mobile ride application (RideApps) services, such as Uber and Lyft, are increasingly becoming a mode of choice for ground access at airports throughout the country. To address the substantial shift to RideApp services, Massport provided a comprehensive plan to address associated impacts in the *2017 ESPR*, and a status update of that plan is provided later in this chapter.

Transit, HOV, and shared-ride modes are designed for efficient transport of multiple travelers. With a higher occupancy and bi-directional transport of air passengers (arriving at and departing from the Airport), the number of vehicle trips per passenger for these modes is comparatively low. On the other hand, private vehicles that park at the Airport (or an off-Airport lot) generate a single vehicle trip to the Airport for the departing air passenger and a single vehicle trip from the Airport for the arriving air passenger. Even less desirable, vehicles that do not remain on the Airport for an air passenger's trip duration, such as those private vehicles that have dropped off an air passenger at the curb, generate a trip to and a trip from the Airport for a departing air passenger and an additional two trips for the arriving passenger. Taxis, RideApps, and black car limousines also produce deadhead trips when they depart Logan Airport empty after dropping off an air passenger (particularly in the morning) or arrive at the Airport empty to pick up air passengers. As **Figure 5-1** shows, when measured in terms of vehicle trips generated, the most environmentally desirable mode is HOV (transit and shared-ride), followed by drive-and-park, with the least desirable modes being drop-off and pick-up.

Figure 5-1 Ground Access Mode Choice Hierarchy

Source: VHB.
Notes: Short-term parking is included under "Drop-off/Pick-up."
Rental cars are included in the "Long-Term Parking" category.

2020/2021 On-Airport Vehicle Traffic: Volumes and Vehicle Miles Traveled (VMT)

This section reports on Logan Airport's traffic-related activity for 2020 and 2021, specifically:

- Gateway traffic volumes; and
- Estimated On-Airport VMT.

Massport's leadership in and commitment to developing, promoting, and providing alternative means of ground transportation for access to and from Logan Airport are key to reducing gateway traffic volumes and on-Airport VMT. The diverse range of environmentally responsible ground transportation modes by which air travelers, employees, and other Airport users can access the Airport reduces reliance on automobile travel, minimizes traffic congestion, and contributes to improvements in air quality.

Gateway Traffic Volumes

Gateway roadways are defined as access points to and from Logan Airport, which primarily include Route 1A to and from the north, the Sumner and Callahan Tunnels (Route 1A to and from the south), the Interstate-90 Ted Williams Tunnel ramps (east/west), and Frankfort Street/Neptune Road. **Figure 5-2** shows the roadway infrastructure at Logan Airport in 2020 and 2021.

Data Collection and Annual Average Daily Calculation Method

All of the Airport's gateway roadways are equipped with permanent traffic count stations, as part of the Airport-wide Automated Traffic Monitoring System (ATMS). These stations provide data to calculate:

- Annual average daily traffic (AADT);
- Annual average weekday daily traffic (AWDT); and
- Annual average weekend daily traffic (AWEDT).

Since these data are automatically collected continuously throughout the year, seasonal adjustment factors are only necessary when significant gaps in the data occur (typically due to equipment failure/malfunction or construction activity). Seasonal adjustment factors, when used, are generally based on a combination of the monthly variation of counts from other ATMS stations or of the same station in the previous year.

FIGURE 5-2 Logan Airport Roadway Network | **2020/2021 Environmental Data Report**

Parking Garages

Terminal Buildings

Airport Roadways

0 450 900 1800 Feet

Annual Average Daily Activity Levels

Table 5-1 summarizes the average daily gateway traffic volumes at Logan Airport for the years 2011, 2017 (the two most recent ESPR submission years), and 2018 through 2021. A full table with average daily gateway traffic volumes data for years 2010 through 2021 is found in Appendix G*, Ground Access to and from Logan Airport*. It includes AADT, AWDT, AWEDT, and annual air passengers, for reference.

The AADT entering and departing Logan Airport via its gateway roadways decreased by 59.5 percent and increased by 58.5 percent between 2019 and 2020 and between 2020 and 2021, respectively. The change in average daily traffic can be attributed primarily to the impacts of COVID-19 and a slow recovery:

- A 70.3 percent decrease in air passenger activity between 2019 and 2020 and a 79.7 percent increase in air passenger activity between 2020 and 2021;
- The impact of RideApps, whose activity decreased by 60 percent between 2019 and 2021; and
- A decrease in drop-off/pick-up activity by private and commercial automobiles.

Due to the impacts of COVID-19, the daily traffic volumes on the Airport roadway system decreased significantly in 2020. While the traffic volumes began recovering in 2021, traffic volumes recorded in 2021 are still significantly lower than pre-pandemic levels. In 2021, air passenger volumes were approximately 22 percent lower than in 2011[4]; while AADT volumes were approximately 10 percent lower over the same time period. This mismatch is likely related to the health and safety effects of the pandemic. It is anticipated that as conditions further recover, AADT and passenger growth will once again align. This trend is beginning to be realized in early preliminary data available for 2022. Massport continues to promote HOV ground access as a primary way to access the Airport.

The decline in gateway traffic volumes is also partially attributable to decline in non-air passenger activity such as air cargo, aviation services, and other Airport activities due to the effects of the pandemic.

4 2011 represents an ESPR analysis year and the last time major changes to VMT methodology were implemented. As such, it is the earliest year in which a direct comparison is relevant.

Table 5-1 Logan Airport Gateways: Annual Average Daily Traffic, 2011, 2017–2021

	AADT		AWDT		AWEDT		Annual Air Passengers	
Year	Volume	Percent Change	Volume	Percent Change	Volume	Percent Change	Level of Activity	Percent Change
2011	99,449		104,863	6.0%	85,879		28,907,938	
2017	124,646	4.1%	130,601	3.9%	109,723	5.0%	38,412,419	5.9%
2018	131,432	5.4%	137,105	5.0%	117,425	7.0%	40,941,925	6.6%
2019	137,331	4.5%	143,189	4.4%	122,678	4.5%	42,522,411	3.9%
2020	**55,668**	**(59.5%)**	**57,210**	**(60.0%)**	**51,744**	**(57.8%)**	**12,618,128**	**(70.3%)**
2021	**88,238**	**58.5%**	**90,185**	**57.6%**	**83,371**	**61.1%**	**22,678,499**	**79.7%**

Source: Massport.
Notes: Numbers in parentheses ( ) indicate negative numbers. Gateway roadways include access to/from: Route 1A (including the Sumner and Callahan tunnels), I-90/Ted Williams Tunnel, Frankfort Street/Neptune Road, and Maverick Street.
AADT Annual average daily traffic.
AWDT Annual average weekday daily traffic.
AWEDT Annual average weekend daily traffic.

On-Airport VMT

On-Airport VMT is calculated based on the total number of miles traveled by all vehicles on the Logan Airport roadway system. VMT is an important metric because it is used to calculate motor vehicle air quality emissions. It is also one indication of the level of traffic on roadways in specific areas and at specific times. As discussed in the *2018/2019 EDR*, Massport has migrated from the previous VISSIM[5] microsimulation model to a new spreadsheet-based volumetric model to estimate on-Airport VMT. This model takes advantage of the data available through Massport's various transportation and transaction-based data collection systems.

Estimated VMT Calculations and Modeling Results

Consistent with previous years, the following specific time periods were analyzed for 2020 and 2021:

- Morning peak hour;
- Evening peak hour;
- Highest consecutive 8-hour (High 8-Hour); and
- Average weekday VMT.

Table 5-2 summarizes the VMT estimates for Logan Airport-related traffic from 2020 and 2021 and provides 2011 and 2017 to 2019 data for historical context. Absent any major shift in traffic volumes entering the gateways, the change in VMT is expected to generally mirror the change in traffic volume. In 2020 and 2021, mode shift due to the pandemic altered this general trend. But as discussed above, preliminary 2022 data

5 PTV America. 2011. Verkehr In Städen Simulationsmodell – VISSIM version 5.40 [computer software].

suggest the trend is returning as Airport operations and passenger behavior begin to normalize. The decrease in average weekday VMT between 2019 and 2020 was approximately 74.8 percent, while gateway volumes decreased by 59.5 percent. Weekday VMT increased significantly between 2020 and 2021, compared to the increase in gateway traffic volume. The increase in 2021 can be attributed to an increase in three primary factors: increased air passenger demand, increased commercial and private drop-off/pick-up activity by passengers, and a change in general travel patterns to and from and within the Airport over the last year. Details of the 2020 and 2021 VMT modeling results are presented in Appendix G*, Ground Access to and from Logan Airport*.

Table 5-2 Airport Study Area Vehicle Miles Traveled (VMT) for Airport-Related Traffic, 2011, 2017-2021

Analysis Year[1]	AM Peak Hour	PM Peak Hour	High 8-Hour	Average Weekday	Average Weekday Percent Change
2011	8,391	10,978	76,920	167,647	-
2017	9,844	12,009	86,678	196,503	11.1%
2018	9,452	12,447	91,450	205,344	4.5%
2019	9,477	12,577	91,336	209,900	2.2%
2020	**2,904**	**3,394**	**24,072**	**52,794**	**(74.8%)**
2021	**5,993**	**7,424**	**53,180**	**118,937**	**125.3%**

Source: VHB and Massport.
Notes: Numbers in parentheses ( ) indicate negative numbers.
1 Data provided for 2011 and 2017 used the previous VISSIM model. Data from 2018 to 2021 used the new VMT model discussed above.

2020/2021 Ground Transportation Ridership and Activity Levels

This section of the chapter:

- Provides an overview of transportation services available to Logan Airport users from the Boston metropolitan area;
- Reports on 2020/2021 ridership levels and recent historical trends;
- Reports on Massport's progress in meeting ground access goals; and
- Describes Massport's cooperative planning with other transportation agencies in Massachusetts.

Logan Express, MBTA Transit, and Water Transportation Modes

Annual ridership levels for HOV, transit, and shared-ride transportation modes serving Logan Airport are summarized in **Table 5-3**. A discussion of the services follows.

Table 5-3 **Annual Ridership and Activity Levels on Logan Express, MBTA, and Water Transportation Services, 2011, 2017–2021**

	MBTA Transit		Logan Express Bus			Water Transportation[1]	
Year	Blue Line[2]	Silver Line	Air Passengers	Employees	Total	MBTA Ferry	Private Water Taxis
2011	2,277,311	900,359	649,609	536,513	1,186,122	33,403	58,879
2017	2,197,783	N/A	1,140,235	695,504	1,835,736	7,424	83,689
2018	2,295,250	N/A	1,182,097	750,574	1,932,671	6,609	77,813
2019	1,635,147	N/A	1,381,700	824,084	2,205,784	7,467	61,071
2020	**1,041,968**	**395,465**	**347,440**	**314,982**	**662,422**	**938**	**4,080**
2021	**1,361,036**	**512,872**	**514,702**	**266,062**	**780,764**	**1,760**	**19,363**
Percent Change (2019-2020)	**(36%)**	**n/a**	**(75%)**	**(62%)**	**(70%)**	**(87%)**	**(93%)**
Percent Change (2020-2021)	**31%**	**30%**	**48%**	**(16%)**	**18%**	**88%**	**375%**

Source: Massport.
Notes: Numbers in parentheses ( ) represent a decrease in annual ridership.
N/A Not available.
1 MBTA Ferry includes the Harbor Express F2/F2H service, Hingham/Hull-Logan and Long Wharf. Service from Quincy Fore River was suspended in 2013. Private water taxis include: Boston Harbor Cruises Water Bus and Boston Water Taxi.
2 Airport Station fare gate entrances facing Logan Airport only. Station activity is not limited to only Airport-related passengers.

Logan Express Bus Service

Due to COVID-19, Massport temporarily suspended bus service to Logan Airport for air passengers and employees from suburban park-and-ride facilities in Peabody and Woburn. During this same time, Logan Express operated under reduced (hourly) schedules for the Braintree and Framingham lines. In 2021, Massport improved headways to 30 minutes on the Braintree and Framingham lines and restored the Woburn Line at 30 minute headways. In February 2022, Massport restored the Peabody line. Service to and from Back Bay, which has been suspended since March 2020, restarted in October 2022. Full-service bus terminals and secure parking are provided at all four suburban locations. No customer parking is provided at the Back Bay location. In 2021, Massport approved a new rate schedule that reduced the cost of Logan Express bus trips from $12 to $9 each way with online ticket purchases. **Figure 5-3** depicts Logan Express bus locations with respect to the regional transportation network.

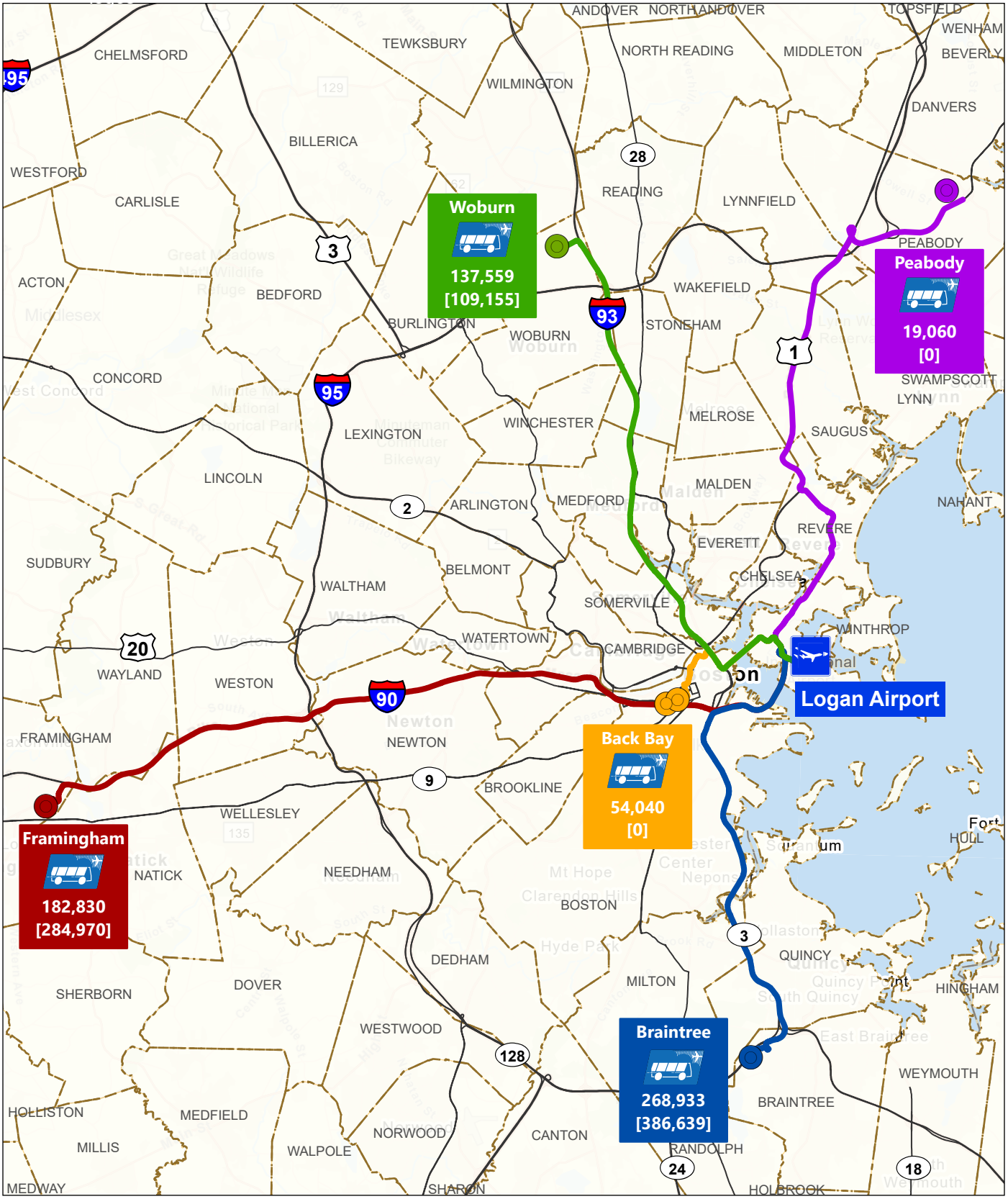


FIGURE 5-3 **Logan Express Bus Service Locations, Routes, and 2020/2021 Ridership**

2020/2021 Environmental Data Report

Logan Airport

Main Roads

Massachusetts Municipalities

2020 [2021] 2020 Ridership [2021 Ridership]

Logan Express Stations

- Back Bay
- Braintree
- Framingham
- Peabody
- Woburn

Logan Express Routes

- Back Bay
- Braintree
- Framingham
- Peabody
- Woburn

0 10000 20000 40000 Feet

Table 5-3 compares 2020 and 2021 ridership on Logan Express to the previous respective years. Logan Express passenger ridership from suburban park-and-ride locations decreased by 70 percent between 2019 and 2020 and increased by 18 percent between 2020 and 2021. A detailed breakdown of Logan Express ridership is presented in Appendix G, *Ground Access to and from Logan Airport*.

Massport continues to evaluate and plan for the recovery of air passenger activity and remains committed to implementing the broad range of ground access strategies that were outlined in the *2017 ESPR*. The schedule for those services and planned improvements has, however, been adjusted due to the continuing operational constraints and revenue reductions. Massport continues to carefully review both on and off-Airport activity levels and will adjust its ground access programs to align with passenger levels. Future EDRs will provide detailed updates on all service adjustments and activity levels.

Massport continues to promote Logan Express ridership through a series of initiatives, thereby reducing VMT, congestion, and air quality emissions. At suburban locations, Massport proposes the following action plan:

- Increase Braintree Logan Express service from two to three trips per hour (implemented in May 2019 but reduced to hourly service in March 2020 due to the impacts of COVID-19. In July 2021, service resumed to every half hour service).
- Add approximately 1,000 additional spaces to the Framingham garage (permitting completed in 2020; however construction is deferred. Massport is pursuing federal funding.).
- Marketing to support Logan Express strategy and increase ridership.
- Implement Logan Express electronic ticketing (completed in March 2021).
- Evaluate new Logan Express suburban locations, with a plan to open at least one new site. Peabody Logan Express relocated in February 2022. Massport is evaluating opportunities for further expansion of capacity and service.
- Explore RideApp Last Mile connections.
- Continue to monitor parking capacity at all Logan Express sites.

Until March 2020, the Back Bay Logan Express operated daily trips between the hours of 5:00 AM and 10:00 PM. Riders with a current, valid MBTA pass received a reduced fare. Massport implemented a number of improvements to the service with a focus on boosting urban Logan Express ridership and is considering the following additional services:

- Change pick-up/drop-off location from Copley to Back Bay Station (implemented in 2019);
- Discount one-way fare from $7.50 to $3.00 (implemented in 2019);
- Provide free service from Logan Airport (implemented in early 2019);
- Pilot priority security line status for riders (implemented in 2019, suspended in 2020, and resumed in October 2022);
- Marketing campaign to support increased ridership (ongoing);
- Implement Logan Express electronic ticketing (implemented upon reopening in October 2022); and
- Explore a second urban Logan Express service.

The service enhancements implemented at Back Bay reversed the downtrend in ridership at this location. In March 2020, the Back Bay Logan Express service was suspended due to the drop in ridership but restarted in October 2022.

Rapid Transit

Table 5-3, previously shown, compares 2020 and 2021 ridership on rapid transit to prior years. Almost 15 percent of passengers with trip origins in Boston, Cambridge, Brookline, and Somerville used MBTA public transit to travel to the Airport via the Blue Line or Silver Line. Both services are important for reducing automobile travel to the Airport; as past survey results show, over three quarters of users of the Blue Line and Silver Line indicated that their alternative mode of travel to Logan Airport would have been a taxi or RideApp service, or that they would have been dropped off at the Airport by private vehicle. **Figure 5-4** illustrates the public transportation options to access Logan Airport.

The data indicate that overall ridership on the Blue Line has decreased by 36 percent between 2019 and 2020 and increased by 31 percent in Blue Line fare gate activity between 2020 and 2021. As noted in previous reports, fare gate data do not distinguish between Airport related riders and East Boston users, nor do they distinguish between Logan Airport air passengers and employees. Therefore, Airport passenger ridership levels on the Blue Line cannot be directly identified.[6] However, the decline in 2020 on the Blue Line activity can be attributed to reduced Airport activity and the effects of the COVID-19 pandemic that altered the passengers' numbers of trips and mode choice.

On the Silver Line, bus service from Logan Airport is free (as are transfers to the Red Line at South Station), eliminating the need for fareboxes. Eliminating fare collection allows all three doors to be used for boarding, thus improving Logan Airport's curb operations and schedule adherence, and reducing idling. But as a result of that change, passenger boarding data were no longer available. Starting in 2020, the MBTA was again able to provide Silver Line boarding data. While no pre-pandemic comparison is available, the number of passengers for the Silver Line increased by 30 percent between 2020 and 2021, indicating a level of service recovery.

6 Based on automated fare gate entrance counts, approximately 50 percent of entrances occur via the Bremen Street Park fare gates at Airport Station. Based on Massport curbside observations, approximately 45 percent of Airport Station entrances are attributable to Airport users.

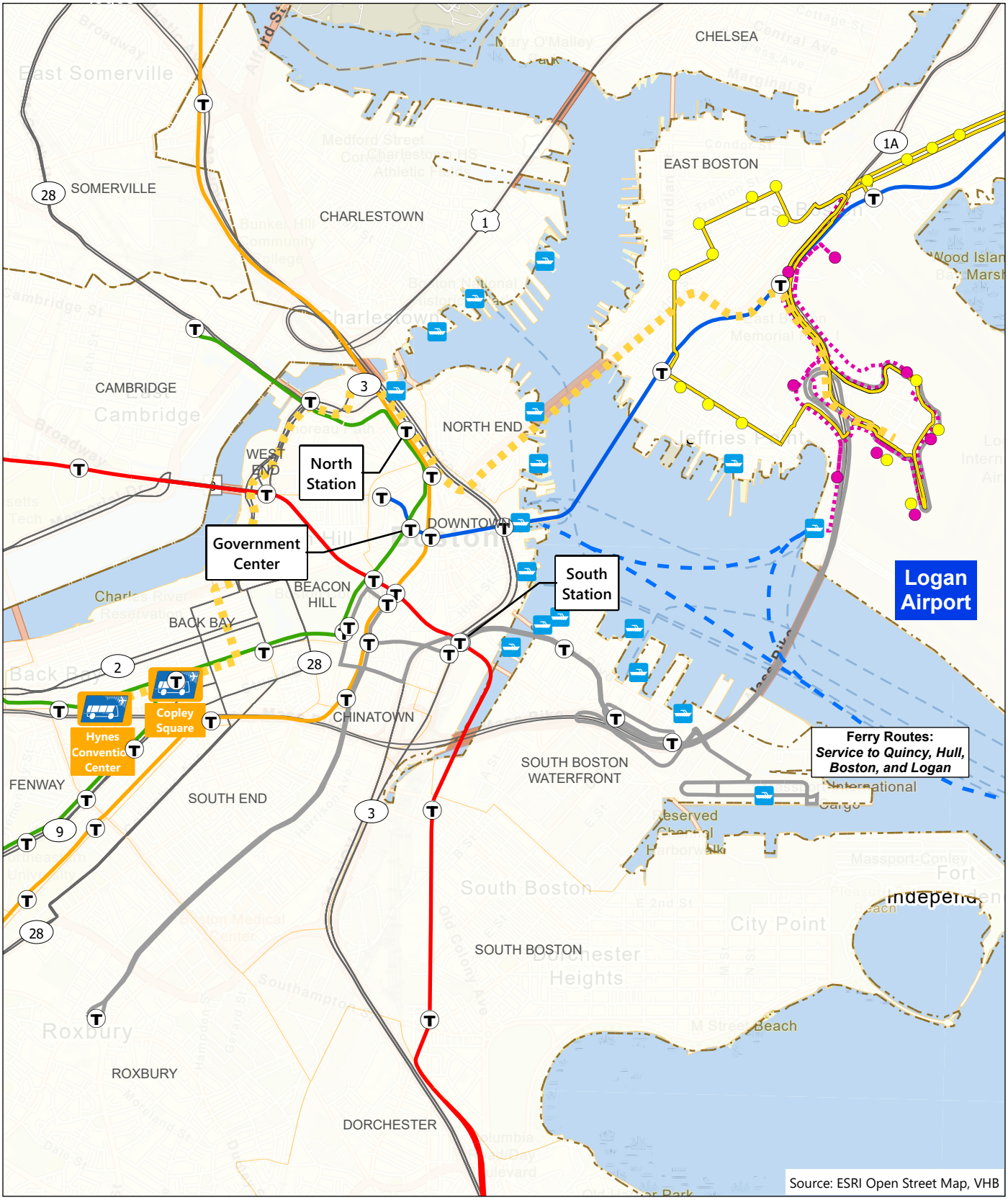


FIGURE 5-4 Public Transportation Options | **2020/2021 Environmental Data Report**

- Water Taxi
- Silver Line Stop at Airport Terminals
- MBTA Station
- Back Bay Logan Express Pick Up Locations
- Sunrise Shuttle Routes with Stops
- Airport Shuttle Routes with Stops
- Ferry Route
- Blue Line
- Green Line
- Orange Line
- Red Line
- Silver Line

0 1500 3000 6000 Feet

Water Transportation

Table 5-3 above compares 2020 and 2021 ridership on water transportation to prior years. Three companies provide water transportation within the Boston area: Boston Harbor Cruises Water Bus, Boston Water Taxi, and MBTA Harbor Express. Collectively, these companies serve numerous destinations throughout the Boston Inner Harbor. The water taxi landing locations include: Long, Rowes, and Central wharfs in downtown Boston; the World Trade Center and the Moakley Courthouse in South Boston; and stops in the North End, Charlestown, Chelsea, and East Boston. A new stop opened in 2019 at Lovejoy Wharf near North Station. The MBTA Harbor Express provides services to Long Wharf and destinations outside of the Inner Harbor, including Hingham and Hull.[7] The water transportation services stop at the Logan Airport dock on Harborside Drive. Massport provides a shuttle bus service between the Logan Airport dock, the MBTA Airport Station, and all Airport terminals. Massport also provides its employees with a subsidy for water transportation modes. Currently, the one-way fare to Logan Airport is $9.75 from Long Wharf and from Hingham/Hull. In 2020, all water transportation services to Logan were temporarily suspended due to the pandemic. Service was restored at the end of 2021.

Other HOV Modes: Scheduled Buses, Shared-Ride Vans, Courtesy Vehicles, and Black Car Limousines

Massport provides priority, designated curb areas at all Airport terminals to support the use of HOV and transit modes, including privately-operated scheduled buses and shared-ride vans and black car limousine services. The majority of scheduled shared-ride carriers use a combination of 15- to 40-passenger vehicles and 40+ passenger coach buses. Scheduled express bus service is offered by several privately-operated carriers from outlying areas of the Boston metropolitan area and neighboring states. Courtesy vehicle services include services between Logan Airport and many hotels in the Greater Boston area. Shared-ride vans also provide service from central and western Massachusetts and other regional points throughout New England.

As shown in **Table 5-4**, the estimated total number of seats provided by these HOV modes decreased by about 68.5 percent in 2020 compared to 2019; and increased by 66.3 percent in 2021 compared to 2020. The increased use of RideApps over the past few years and the impact of COVID-19 has reduced the number of scheduled vans and black car limousines used for Airport transportation.

7 The MBTA ferry from Hingham/Hull to the Logan Airport Ferry Dock runs less frequently and is less consistent than Blue Line and Silver Line services throughout the day. Frequencies between ferries range from one hour to several hours. There are 14 MBTA ferries to and from Logan Airport on weekdays; however, there are no MBTA ferries direct to Logan Airport from the South Shore during morning commuting times.

Table 5-4 Other Scheduled and Unscheduled HOV Modes: Scheduled Buses, Shared-Ride Vans, Courtesy Vehicles, and Black Car Limousines, 2011, 2017–2021

	Estimated Seats			
Year	**Scheduled Buses**	**Scheduled Vans & Limousines**	**Courtesy Vehicles**	**Limousines (unscheduled)**
2011	2,251,480	996,208	1,885,575	1,991,672
2017	2,969,395	385,221	3,057,645	2,528,057
2018	2,856,260	325,032	3,235,875	2,133,060
2019	2,752,970	297,631	3,125,865	1,953,236
2020	**949,960**	**47,976**	**1,091,895**	**467,564**
2021	**2,094,730**	**34,648**	**1,418,745**	**705,904**
Percent Change (2019 - 2020)	**(65%)**	**(84%)**	**(65%)**	**(76%)**
Percent Change (2020 - 2021)	**121%**	**(28%)**	**30%**	**51%**

Source: Massport.
Notes: Numbers in parentheses ( ) represent a decrease in annual seats.

Pedestrian Facilities and Bicycle Parking

Massport provides a significant Airport-wide pedestrian network that links the terminals as well as linking Logan Airport to the neighboring community. Sidewalks along Harborside Drive and Hotel Drive connect to the terminals, where a series of overhead, enclosed walkways provide pedestrian access to the Central and West Parking garages as well as to and from the Hilton Hotel. The sidewalks along Harborside Drive, Transportation Way, North Service Road, and the Harborwalk facilitate pedestrian access to the Airport water shuttle boat dock, MBTA Blue Line Airport Station, and the pedestrian and bicycle pathways at Memorial Stadium Park, Bremen Street Park, and the East Boston Greenway.

Bicycle parking racks are provided at many landside facilities. Generally, these racks are expected to primarily serve employees but are open for use by air passengers as well. Terminal A, Terminal E, the Logan Office Center, Signature General Aviation Terminal, the Economy Parking Garage, the Green Bus Depot, and the Airport MBTA Station all have bicycle racks. The Rental Car Center has sheltered bicycle parking racks for use by both employees and passengers. Shower and changing facilities are provided at the Logan Office Center for Massport employees.

Non-HOV Modes

Logan Airport passengers also access the Airport by a number of automobile modes, including private automobiles, taxis, RideApps, and rental cars.

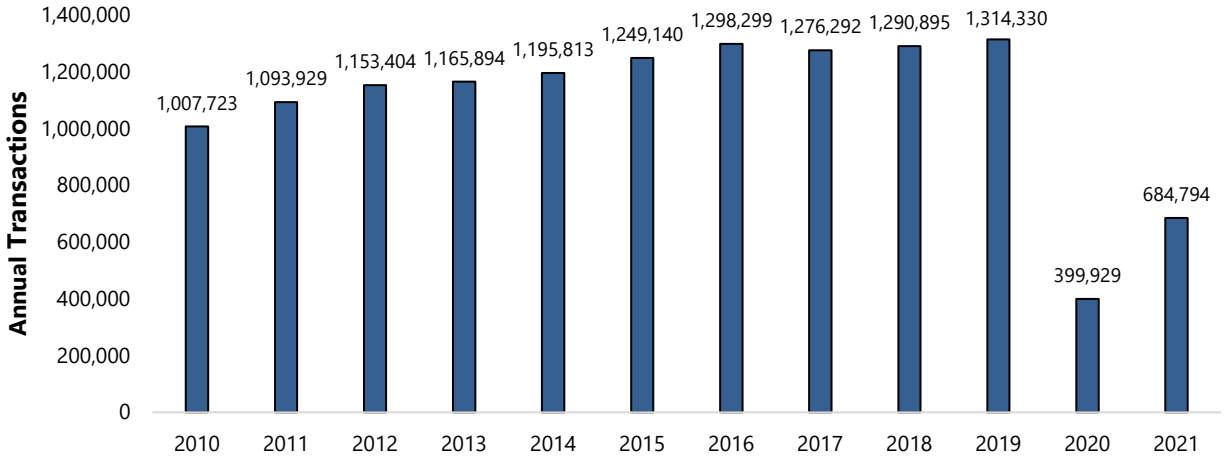
Automobile Access

Private automobile access to the Airport is classified as either curbside drop-off or parked-on-Airport (terminal area or remote/Economy). Volumes and VMT associated with these trips are described in this chapter's section on traffic conditions.

Rental Cars

Eleven rental car brands served Logan Airport in 2020 and 2021: Advantage, Alamo, Avis, Budget, Dollar, Enterprise, Hertz, National, Thrifty, Payless, and Firefly. Zipcar also provides services from the rental car facility. Due to the impact of COVID-19 on air travel, the rental car transactions dropped significantly in 2020 (see **Figure 5-5**). As passenger levels increased in 2021, the rental car transactions also increased. However, the number of transactions are still significantly lower than pre-COVID levels.

Figure 5-5 Annual Rental Car Transactions at Logan Airport, 2010–2021



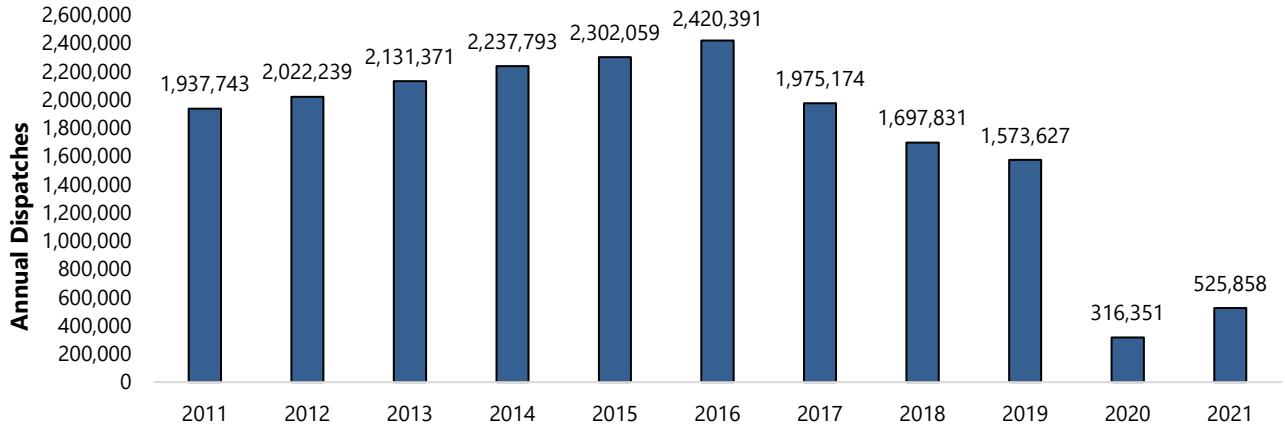
Source: Massport.

Taxis and RideApps

Taxi ridership trends are reflected in the total number of taxis dispatched from Logan Airport (serving outbound passengers). The number of taxis dispatched has generally declined since 2017 (see **Figure 5-6**), attributed to an increase in RideApp operations at the Airport. COVID-19 has had a further impact on taxi ridership, resulting in a drop of approximately 80 percent in 2020 compared to the previous year. As passenger levels increased in 2021, the taxi ridership transactions also increased. However, the number of riders is still significantly lower (about half) than pre-COVID levels.

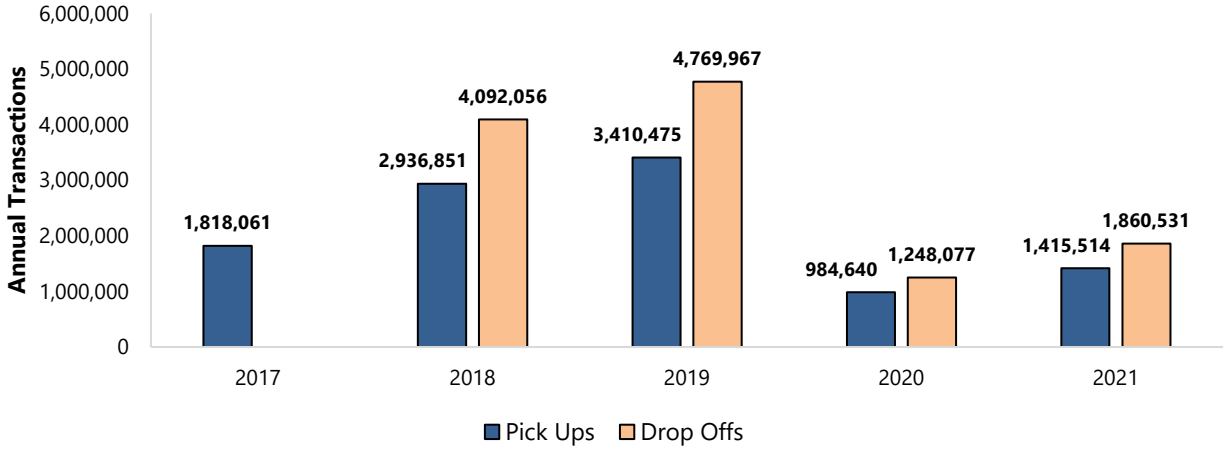
Figure 5-7 presents RideApp transaction data for 2017 through 2021. To address congestion issues caused by RideApps prior to the pandemic, Massport reconstructed the ground floor of the Central/West garage to facilitate passenger drop-off (between the hours of 10:00 AM and midnight) and pick-up (all times). This service change was completed in December 2019. As with other for-hire modes, COVID-19 has had an impact on RideApp activity, resulting in a drop of approximately 70 percent in 2020 compared to the previous year. As passenger levels increased in 2021, the number of ridershare users also increased. However, the number of trips is around one-third of pre-COVID levels.

Figure 5-6 Annual Taxi Dispatches at Logan Airport, 2010-2021



Source: Massport.

Figure 5-7 Annual RideApp Transactions at Logan Airport, 2017-2021



Source: Massport.
Notes:
1 Does not include January 2017.
2 RideApp drop off was first authorized at Logan Airport in 2018.

2020 and 2021 Parking Conditions

Massport manages the on-Airport parking supply at Logan Airport to promote long-term rather than short-term parking (thus reducing the number of daily trips to Logan Airport); support efficient use of parking facilities; provide good customer service; and comply with the provisions of the Logan Airport Parking Freeze. Logan Airport contains multiple parking facilities, including the Central Parking Garage (convenient access to Terminals A, B, C, and E), Terminal B Garage, Terminal E Parking Lots, and Economy Garage (free shuttle bus service to and from the terminals 24 hours a day). Details on 2020 and 2021 parking conditions are presented in the following sections.

Massport has a comprehensive parking monitoring and management program including tracking of:

- On-Airport parking conditions, including parking facilities and supply, demand, and parking rates; and
- Parking programs (including preferred parking for hybrid vehicles and electric car charging stations).

Logan Airport Parking Freeze and On-Airport Parking Availability

The number of commercial and employee parking spaces allowed at Logan Airport is regulated by the Logan Airport Parking Freeze (310 Code of Massachusetts Regulations 7.30), which is an element of the Massachusetts State Implementation Plan (SIP) under the Federal Clean Air Act (42 U.S.C. §7401 et seq. [1970]). As required, Massport submits semi-annual filings to the Massachusetts Department of Environmental Protection (MassDEP) demonstrating Massport's compliance with the Logan Airport Parking Freeze. The full reports for March and September 2020 and 2021 are provided in Appendix G, *Ground Access to and from Logan Airport*. All reports (September 2012 through March 2021) are available online (https://www.massport.com/massport/about-massport/project-environmental-filings/logan-airport/). Total in-service commercial spaces are illustrated in **Figure 5-8**, along with the total number of parking spaces permitted on-Airport and the allocation of those spaces between commercial and employee spaces through 2021. Construction on the Airport and shifting of total spaces from one area to another (as discussed further below) account for the fluctuation of in-service spaces from year to year. Fewer spaces have been available since the onset of the pandemic.

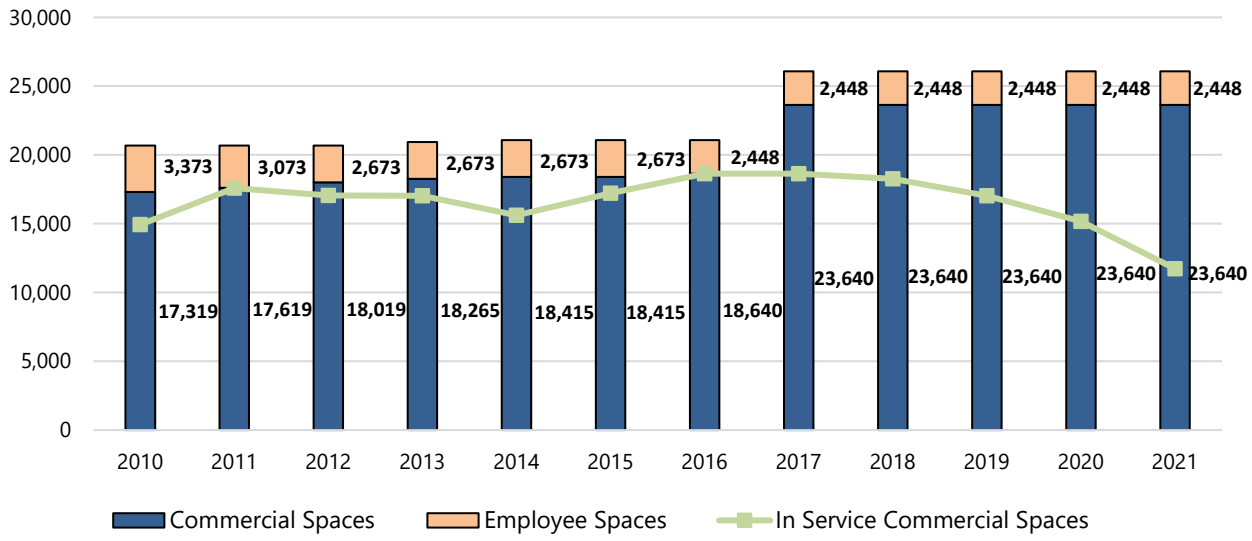
The Logan Airport Parking Freeze sets an upper limit to the supply of commercial and employee parking spaces at Logan Airport. As permitted (and encouraged) by the Parking Freeze provisions, Massport has converted employee spaces to commercial spaces, within the overall limit imposed by the Logan Airport Parking Freeze. Massport has also transferred Airport-related park-and-fly spaces managed under the East Boston Parking Freeze[8] to be managed under the Logan Airport Parking Freeze.

Under the Logan Airport Parking Freeze regulation, Massport must monitor the number of commercial and employee vehicles parked on-Airport and ensure that the total number of parked commercial and employee vehicles does not exceed the Parking Freeze limits. If the number of commercially parked vehicles exceeds the allocated commercial parking limit under the Parking Freeze on any day, those additional vehicles are

8 310 Code of Massachusetts Regulations 7.31.

considered to be using "Restricted Use Parking Spaces." Use of Restricted Use Parking Spaces is allowed under the regulation when Logan Airport experiences "extreme peaks of air travel and corresponding demand for parking spaces" and may be made available for use only at such times, up to ten days in any calendar year. These spaces must be provided free of charge when demand exceeds the limit. Given the pandemic conditions, the parking freeze limits were not exceeded in 2020 or 2021.

Figure 5-8 Allocation of On-Airport Parking Spaces



Source: Massport.

1 In 2011, 700 employee spaces were converted to commercial spaces under the Logan Airport Parking Freeze.

2 In July 2012 and June 2013, Massport acquired property in East Boston that reallocated 396 park-and-fly spaces from the East Boston Parking Freeze area to the Logan Airport Parking Freeze area.

3 In 2016, Massport opened the West Garage Expansion, reallocating 225 employee spaces to commercial and increasing the total number of in-service spaces.

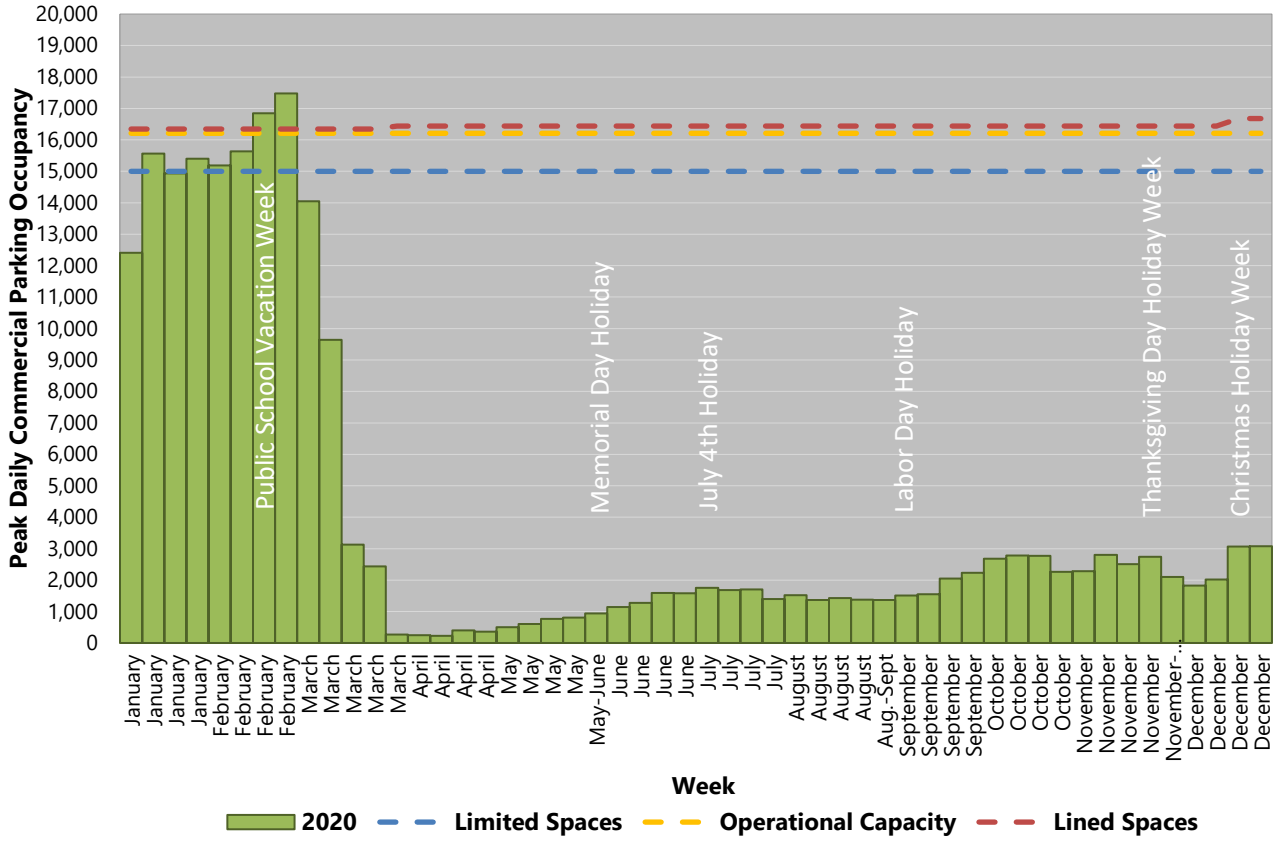
4 In 2017, MassDEP approved an additional 5,000 parking spaces, which are included in the total Parking Freeze count but have not yet been constructed and are therefore not in service.

Daily Parking Occupancy

On-Airport commercial parking occupancy historically peaks mid-week (Tuesday through Thursday) with lower occupancies occurring Friday through Monday. This trend reversed in 2020 and 2021 due to increased leisure share of travel resulting from COVID-19 changes in air passenger activity, particularly business travel. The number of vehicles parked at Logan Airport in commercial spaces over the course of any 24-hour period was obtained from parked vehicle count data for Tuesdays, Wednesdays, and Thursdays, which are collected throughout the year. The peak daily parking occupancy data are presented in **Figure 5-9** and **Figure 5-10** for 2020 and 2021, respectively.

COVID-19 has had an impact on Airport commercial parking activity. Parking exits were approximately 81 percent lower in October 2020 compared to October 2019. As passenger levels increased in 2021, the commercial parking activity also saw an increase. However, the number of commercial parking users are still significantly lower than pre-COVID levels.

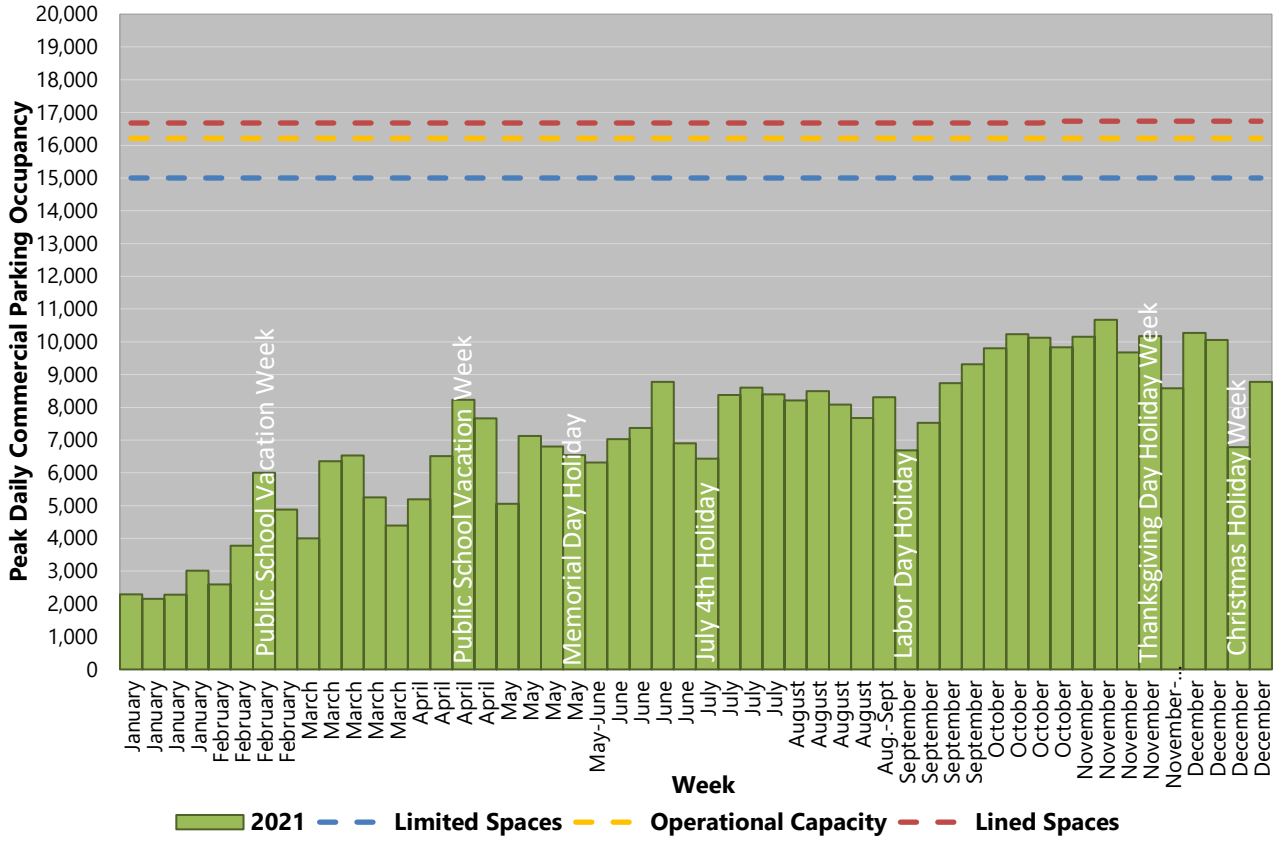
Figure 5-9 Commercial Parking: Weekly Peak Daily Occupancy, 2020



Source: Massport.

Notes: The chart shows the highest daily count for each week in 2020.
At no time in 2020 did the Parking Freeze limit on Restricted Use Spaces exceed the allowed 10 days. Massport was at all times in full compliance with the Parking Freeze regulations in 2020.

Figure 5-10 Commercial Parking: Weekly Peak Daily Occupancy, 2021



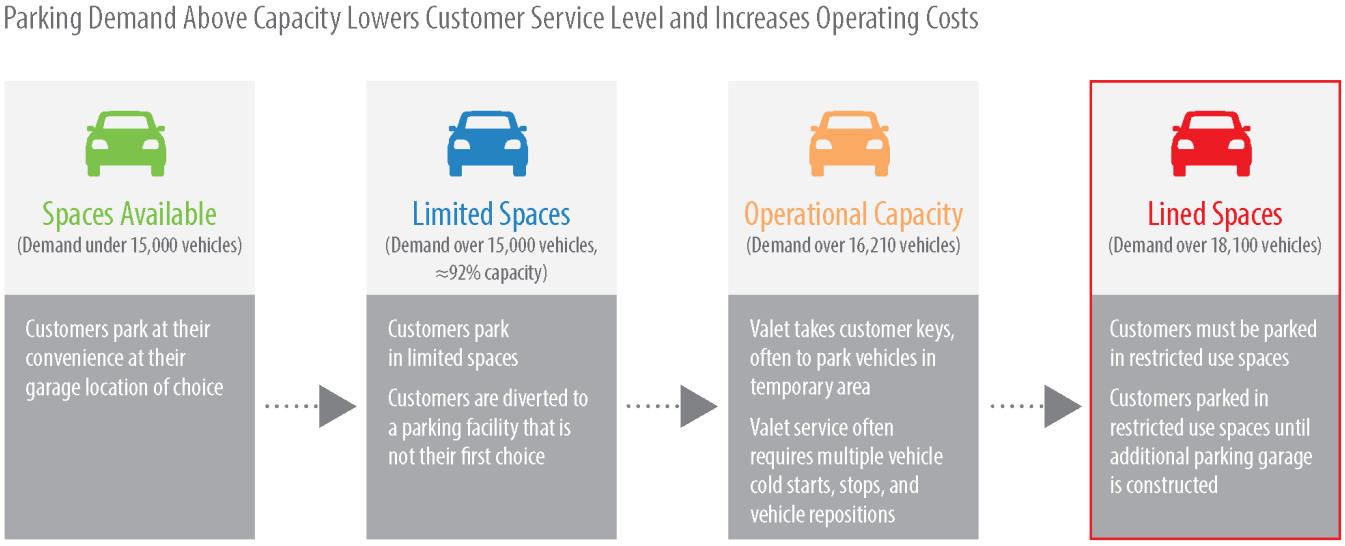
Source: Massport.

Notes: The chart shows the highest daily count for each week in 2021.
At no time in 2019 did the Parking Freeze limit on Restricted Use Spaces exceed the allowed 10 days. Massport was at all times in full compliance with the Parking Freeze regulations in 2021.

Operational Adjustments to Meet Parking Demand

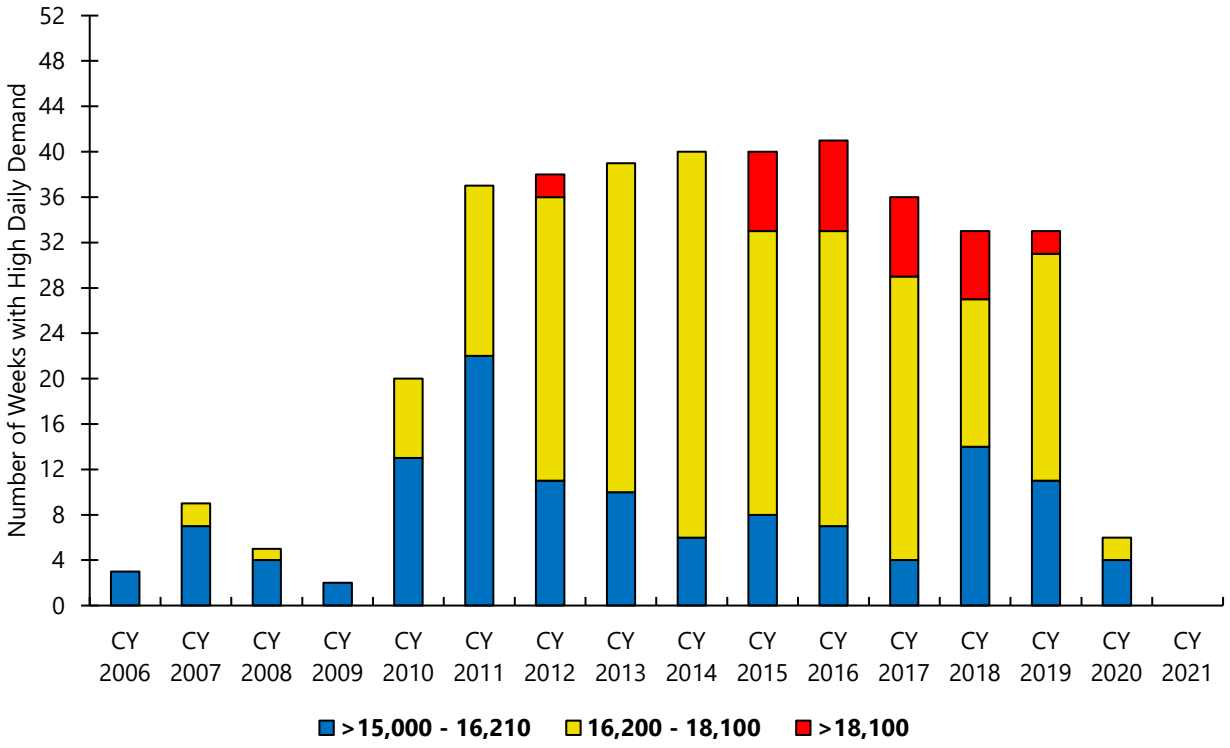
Prior to the pandemic, diversions and valeting had become a regular occurrence at Logan Airport. The inadequate supply of parking causes air passengers to circulate on Airport roadways to find parking. These diversions decrease operational efficiency and compromise customer service; as well as increase on-Airport VMT by generating additional on-Airport trips that would otherwise be unnecessary under uncongested conditions. As shown in **Figure 5-12**, the number of weeks with high demand fell significantly in 2020, and in 2021 parking demand never exceeded 15,000 vehicles.

Figure 5-11 Demand for Parking: Number of Weeks per Calendar Year with High Daily Parking Demand



Source: Massport.

Figure 5-12 2020 and 2021 Parking Demand and Capacity



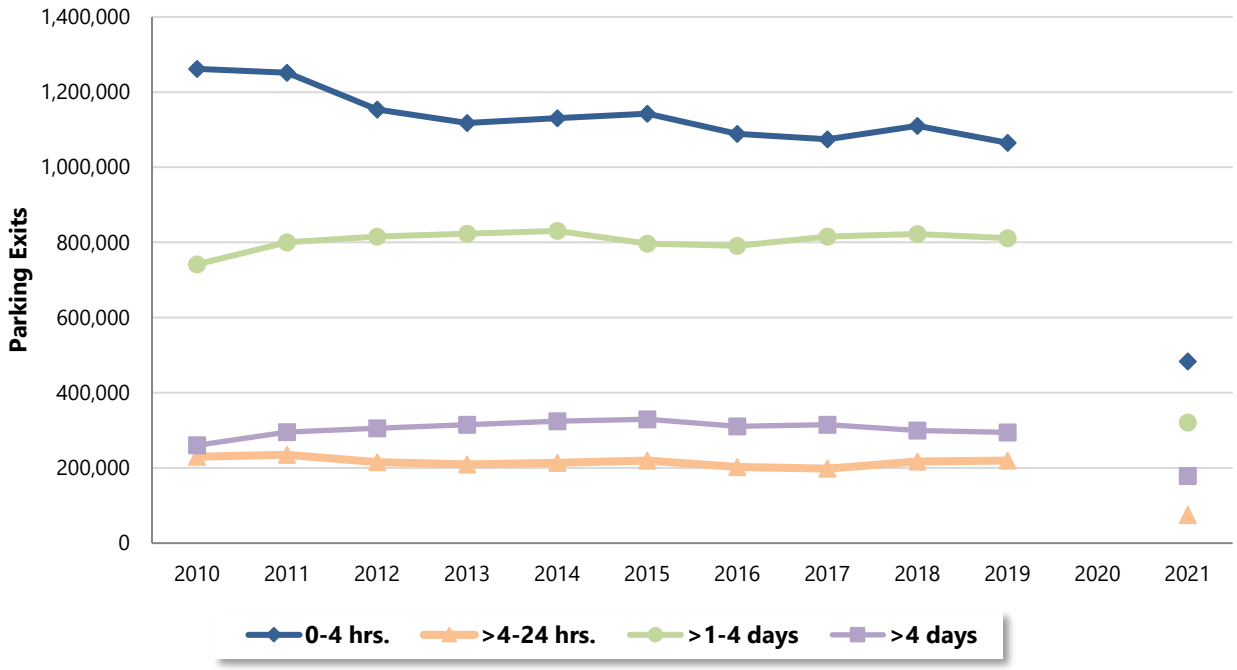
Source: Massport.

Notes: 18,100 represents the total number of lined on-Airport parking spaces allocated in 2020 and 2021. Hotel and general aviation uses, which are included in the Parking Freeze Limit, are excluded from this figure. Current commercial Parking Freeze limit is 23,640. In 2021, parking demand never exceeded 15,000 vehicles

Parking Exits by Duration

As presented in **Figure 5-13**, the total annual parking activity (as defined by revenue parking exits) plummeted during the pandemic. While 2020 data are unavailable due to Massport's migration to a new reporting system, it is anticipated that the 2021 durations reflect recovery similar to other operational services. Overall, short-term parking has been trending down since 2010 and all other parking durations have remained relatively constant, despite unprecedented growth in air passengers. These general trends appear to be maintained in 2021 despite the substantially lower parking activity.

Figure 5-13 Parking Exits by Length of Stay (Parking Duration)



Source: Massport.
Notes: Tickets are representative of revenue parking exits. Previous data reported in 2015 and 2016 have been adjusted down to account for the unintentional inclusion of non-revenue exits. Parking exits in 2020 not available.

2021 Commercial Parking Rates

Massport periodically assesses its parking rate structure to support its ground-access strategy. As detailed in **Table 5-5**, parking rates in the on-Airport garages have not changed since 2019.

With a pay-on-foot system, Massport requires parking fees to be pre-paid at kiosks inside the terminals and at garage access points at the pedestrian walkways, thus improving parking exit flow and reducing vehicle idling and associated emissions at exit plazas. Pay stations are located in the terminals, at the Massport shuttle drop-off/pick-up location in the Economy Garage and at the pedestrian entrances to the Central Garage, Terminal B garage, and Terminal E parking lot.

Table 5-5 On-Airport Commercial Parking Rates, 2019 versus 2021

	Central Parking, Terminal B Garage, Terminal E Lot Rates		**Economy Rates**	
	2019	**2021**	**2019**	**2021**
0 minutes to 1 hour	$8	$8	$8	$8
1 to 2 hours	$21	$21	$20	$20
2 to 3 hours	$26	$26	$22	$22
3 to 4 hours	$30	$30	$25	$25
4 to 7 hours	$34	$34	N/A	N/A
7 to 24 hours	$38	$38	N/A	N/A
4 to 24 hours	N/A	N/A	$29	$29
Additional days 0 to 6 hours	$19	$19	$15	$15
Additional days 6 to 24 hours	$38	$38	$29	$29

Source: Massport.
Note: Most recent rates effective 2021.

Parking Programs and Initiatives

Massport established the following programs and initiatives to support all Logan Airport users, including those picking up travelers who may have time to spare, those traveling to Logan Airport frequently, and those who are driving in environmentally friendly vehicles.

Cell Phone Waiting Lot

The cell phone waiting lot near Terminal E provides approximately 60 parking spaces where drivers waiting for passengers on arriving flights may park. Before the creation of the cell phone waiting lot, drivers who were waiting for arriving passengers either used short-term parking, circulated around the Airport, or dwelled at the curb until asked to move. This facility reduces vehicle emissions by minimizing idling and on-Airport VMT by such motorists. The maximum wait time permitted at this parking lot is 30 minutes, and parking is free of charge.

Parking PASSport and Parking PASSport Gold

Parking PASSport allows users to enter and exit Logan Airport's parking garages and lots with an access card that is linked to an established account for faster payment transactions. Parking fees are automatically charged to a registered credit card and the receipt is emailed to the account holder. Customers in the Parking PASSport programs accounted for approximately 3 percent of parking exits at Logan Airport in 2021. Parking PASSport Gold enrollments have been down substantially throughout the pandemic. Parking PASSport Gold eliminates the need for a motorist to circle the garage looking for available spaces by reserving about 8 percent of spaces in the Central/West Garage and 12 percent of spaces in the Terminal B Garage for customers enrolled in the program. First implemented in 2006, the Parking PASSport Gold program subscribers declined the last two years from 10,466 at the end of 2019 to 6,993 in December 2020 and 5,884 in December 2021.

Parking Reservations

In May 2021, Massport launched a new service that allows customers to make parking reservations in advance of arriving at the Airport. This service offers a limited number of parking spaces but allows the user to guarantee parking up to twelve months in advance. Parking cost is based on the lot chosen and duration of the customer's trip.

Hybrid and Alternative Fuel Vehicle (AFV) Parking

Massport provides 173 hybrid, electric, and AFV only on-Airport parking spaces spread out among the Terminal and Economy Garage in preferred parking locations. Twenty-six of these spaces provide electric charging locations convenient to the terminals. While normal parking rates apply, there is currently no cost for electricity use. Real-time availability of spaces can be found on Massport's website. Currently, there are 101 charging ports installed at Logan Airport and its Logan Express sites.

Ground Access Initiatives

Massport promotes ridership on HOV, transit, and shared-ride modes and maintains efficient transportation access and parking options in and around Logan Airport to reduce the reliance on automobile modes as a means of achieving the HOV mode share goal. Measures implemented by Massport include a blend of strategies related to pricing (incentives and disincentives), service availability, service quality, marketing, and traveler information. Because of the different demographics of Logan Airport air passenger travelers, no single measure alone will accomplish the goal.

Future Passenger HOV Mode Share Goal

In the *2017 ESPR*, Massport presented a new definition of HOV, updating the definition to include the increased knowledge and data from the rapidly changing transportation landscape since the emergence of RideApps. Starting with the *2019 Logan International Airport Air Passenger Ground-Access Survey*, Massport is using an updated definition of HOV that considers vehicle occupancy of taxi, black car limousine, and RideApp modes. Previously, Massport counted all taxis and RideApps as non-HOV and all black car limousines as HOV, regardless of the number of passengers transported. Under the updated definition, taxis, black car limousines, and RideApps that carry two or more air passengers per vehicle are defined as HOV. With this new definition, Massport has a goal of reaching 35.5 percent HOV by 2022 and 40 percent HOV by 2027. Based on the results of the *2019 Logan International Airport Air Passenger Ground-Access Survey*, HOV mode share has reached 40.4 percent, exceeding both near-term and longer-term goals. COVID-19 has had a range of impacts on ground transportation, particularly on the use of ground access HOV modes. While it is anticipated that the HOV mode share dropped as a result of COVID-19 over the short term, Massport expects HOV ridership to recover over time and is striving towards the HOV mode share goals going forward.

RideApp Management Program

Massport initiated RideApp pick-up and drop-off operations in February 2017. RideApp pick-up lots were originally small employee lots that were not intended to handle thousands of daily RideApp pick-ups, contributing to a long wait time for customer and vehicles backing onto terminal-area roadways (causing congestion and delays for customers). **Table 5-6** outlines the policies that Massport has implemented to manage RideApp operations and the status of each. After a drop in RideApp rematch, preliminary 2022 data is indicating that rematch is recovering.

Table 5-6 Massport RideApp Management Plan

Policy	Goal	Status
1. Rematch and Shared Ride	■ Massport has approved changes such that RideApp passengers will be dropped off or picked up at new dedicated areas in the Central Garage through climate-controlled walkways to and from the terminals, facilitating rematch and shared ride.	■ Fully Implemented December 2019
	■ Implement RideApp rematch so drivers dropping off can more easily leave with a passenger.	■ Fully Implemented December 2019
	■ Introduce RideApp shared ride incentives to reduce RideApp vehicles through gateways by increasing vehicle occupancies.	■ Reduced fee for RideApp shared rides; Fully Implemented December 2019
2. RideApp Fee Structure	■ Adopt new RideApp fee structure to support high-occupancy vehicle strategies, encourage shared rides, and reduce gateway congestion.	■ Reduced fee for RideApp shared rides; Fully Implemented December 2019
3. Optimize RideApp Operations On-Airport	■ Introduce RideApp data reporting, new emerging RideApp products, new enforcement tools.	■ Ongoing

Source: Massport.

Long-Term Parking Management Plan

In addition to supporting HOV, Massport actively manages parking supply as another strategy to reduce drop-off/pick-up modes. Massport manages the on-Airport parking supply at Logan Airport to: (1) promote long-term rather than short-term parking (thus reducing the number of daily trips to Logan Airport); (2) support efficient utilization of parking facilities; (3) provide good customer service; and (4) comply with the provisions of the Logan Airport Parking Freeze. Massport has reduced the number of on-Airport employee spaces from over 5,000 to 2,448 spaces to further reduce VMT and promote sustainable transportation options. The 2019 analysis and findings of the *Logan Airport Parking Freeze Amendment Ground Access and Trip Reduction Strategy Studies* can be found on the Massport website: http://www.massport.com/media/3370/final-massport-dep-report.pdf.

The Long-Term Parking Management Plan, which was first included in the *2012/2013 EDR,* lays out a multi-part strategy for efficiently managing parking supply, pricing, and operations—both at Logan Airport and at Massport-controlled off-Airport locations—to maximize HOV, transit, and shared-ride ground access while minimizing both drive-and-park and drop-off/pick-up modes. The Long-Term Parking Management Plan represents Massport's current strategy to manage parking pricing, supply, and demand within the current Logan Airport Parking Freeze.

Table 5-7 describes each parking plan element completed or proposed in the near future, and progress to date. The Long-Term Parking Management Plan sets out the efforts that Massport has undertaken, and will continue to take in the future, to manage the supply, pricing, and operation of parking.

Table 5-7 Long-Term Parking Management Plan Elements and Progress

Parking Plan Element	Progress
Parking Supply:	
■ Add revenue-controlled parking spaces in the terminal area to bring supply up to the maximum number of spaces allowed under the Logan Airport Parking Freeze.	■ As allowed by the amended Parking Freeze and Logan Airport Parking Project (through Massachusetts Environmental Policy Act [MEPA] permitting), Massport is permitted to add 2,000 new commercial spaces in a new garage in front of Terminal E and 3,000 additional spaces through a vertical expansion to the Economy Garage. The Parking Project has been deferred due to the reduction in passenger activity associated with the pandemic.
■ Work to increase the supply of Massport-controlled off-Airport parking at Logan Express sites.	■ Massport plans to add around 1,000 additional spaces to the parking garage at the Framingham Logan Express site. This plan is currently deferred.
Parking Pricing:	
■ Discourage air passengers from driving and parking at Logan Airport by ensuring that the Massport-controlled parking provided at remote Logan Express sites is the least expensive.	■ Massport has reduced parking rates at Logan Express facilities from $11.00 per day to $7.00 per day. The least expensive parking at Logan Airport is $29.00 per day.
■ Encourage more efficient use of available on-Airport parking by maintaining a meaningful price differential between rates at the Economy Parking Garage and terminal-area parking garages.	■ Economy Parking is $29.00 per day in 2021; terminal-area garage and lot rates in 2021 are $38.00 per day.
■ Evaluate increased parking prices for terminal-area parking to encourage Airport passengers and visitors to consider transit and shared-ride alternatives.	■ Parking pricing review is ongoing.
Parking Demand:	
■ Increase the frequency and availability of alternative high-occupancy vehicle (HOV) mode options to decrease use of private vehicles.	■ Massport continues to evaluate opportunities to improve Logan Express service and ridership (specific details are provided elsewhere in this chapter). ■ Massport offers various promotional bus discounts fares at Logan Express. ■ Massport placed signage in all terminals to help promote the use of the regional express bus carriers. ■ Massport continues to sponsor free outbound (from Logan Airport) Silver Line bus service and Back Bay Logan Express service. ■ Massport continues to work with private carriers to provide HOV options to and from Logan Airport.

Table 5-7 Long-Term Parking Management Plan Elements and Progress (Continued)

Employee Parking:	
▪ Continue to work to reduce the number of Airport employees commuting by private automobile and parking at the Airport by providing off-Airport parking both near Logan Airport and at Logan Express sites and implementing measures to enhance employee commuting options.	▪ Massport provides employee parking in Chelsea with free shuttle bus transportation to the Airport. Due to the pandemic, the Chelsea Garage was closed during initial phases of the pandemic but reopened in 2022. ▪ Massport offers reduced employee rates to encourage the use of Logan Express facilities. ▪ Additional early morning and late-night bus service has been added to Logan Express sites to encourage use and better serve Logan Airport employee schedules. ▪ Massport supports the Sunrise Shuttle, which provides early morning bus service for employees from East Boston and parts of Winthrop and Revere prior to the start of Massachusetts Bay Transportation Authority (MBTA) service.

Source: Massport.

Employee Ground Transportation Initiatives

Airport employee transportation has different ground access considerations than passenger transportation. Airport employees often have non-traditional (and often unpredictable) working hours that are difficult to match to typical transit service hours (MBTA service typically runs from 5:00 AM to 1:00 AM). Due to the time-sensitive nature of airline operations, on-time reliability is important for employee transportation, as is flexibility during severe weather or other delays that may extend a typical employee workday or work shift.

Massport strives to reduce the number of Airport employees commuting by automobile, enhance commuter options, and reduce traffic and parking demands at Logan Airport. To help accomplish these objectives, Massport continues to:

- Provide off-Airport employee parking in Chelsea, which is served by frequent free shuttle bus service to the terminals (Route 77) 24 hours a day, seven days a week (due to the pandemic, the Chelsea Garage was temporarily closed and Route 77 was temporarily suspended, while employees were accommodated on-Airport);
- Run free employee shuttle buses between Airport Station and employment areas in the Southwest Service Area and the South Cargo Area locations (Routes 44, 66, and Logan Office Center), the latter of which was temporarily suspended due to COVID-19;
- Operate early morning and late-night Logan Express bus trips for commuters;
- Support the Sunrise Shuttle for early morning bus service from East Boston, Winthrop, and Revere prior to the start of MBTA service;
- Expand and maintain a comprehensive sidewalk/walkway system on Logan Airport to facilitate pedestrian access;
- Provide Massport employee subsidies for water transportation use;

- Provide bicycle racks;[9]
- Advise Airport employers on transit benefits and provide information on available commuting alternatives, ride-matching services, and reduced-rate HOV and transit fare options; and
- Consistent with Logan transportation management goals, Massport contributes $65,000 annually to support the Sunrise Shuttle and other benefits noted above.

Ground Access Goals

Table 5-8 lists each ground access goal and updates on Massport's initiatives associated with each goal. Initiatives are planned, designed, implemented, and continuously refined to account for the changing national, regional, and local conditions that affect Logan Airport and its users.

Table 5-8 Ground Access Planning Goals and Progress (2020/2021)

Goal	2020/2021 Update
Increase air passenger ground-access high-occupancy vehicle (HOV) mode share to 40 percent by 2027	Massport continues to provide and actively promote numerous HOV and shared-ride options to air passengers, including Logan Express bus service, the Silver Line, water shuttle services, and frequent, free shuttle bus service to and from the Massachusetts Bay Transportation Authority (MBTA) Blue Line Airport Station. As transit modes have altered in response to the pandemic, Massport continues to investigate ways to restore and increase HOV mode share. Massport has a goal of reaching 35.5 percent HOV by 2022 and 40 percent by 2027.The *2022 Environmental Status and Planning Report (ESPR)* will provide further updates. Massport continues its partnership with the MBTA to offer free Silver Line boardings at the Airport. The reduced dwell times and faster travel times through the terminal area led Massport to extend the free-fare program indefinitely. Eight Silver Line buses purchased by Massport are operated by the MBTA with Massport paying operating costs for the Silver Line buses. In 2017, Massport funded mid-life rebuilds of four Silver Line buses and rebuilt four additional buses in 2018. The mid-life rebuild extends the useful life of each vehicle by approximately eight years. Massport will purchase eight new Silver Line buses as part of a forthcoming (Spring 2023) MBTA procurement. In 2019, Massport improved Back Bay Logan Express Service by changing the location of the stop at Copley to the MBTA Back Bay Station; discounting one-way fares from $7.50 to $3.00 (return fares from Logan are free); piloting a priority security line status for riders; executing a marketing campaign to support increased ridership; and implementing Logan Express electronic ticketing. While that service was suspended in 2020, the Back Bay route was reinstated in October 2022. Massport is also exploring other opportunities to increase Logan Express capacity and service.

9 Bicycle racks are provided at Terminal A, Terminal E, Logan Office Center, MBTA's Airport Station, Economy Parking Garage (covered), Signature general aviation terminal, the Green Bus Depot (Bus Maintenance Facility), and the Rental Car Center (covered).

Table 5-8 Ground Access Planning Goals and Progress (2020/2021) (Continued)

Goal	2020/2021 Update
Increase air passenger ground-access high-occupancy vehicle (HOV) mode share to 40 percent by 2027	Massport has approvals to add approximately 1,000 additional spaces to the Framingham Logan Express site's garage to encourage growth in this HOV service. These plans are currently deferred due to the pandemic. Massport is evaluating a new urban Logan Express service. This service, if commenced, would be free from Logan Airport and $3 to Logan Airport, and could have three trips per hour. A security line priority status and electronic ticketing are also anticipated.
Reduce employee reliance on commuting alone by private automobile	Massport continues to support the Logan Transportation Management with $65,000 annually (no dues are collected from Airport employers). These funds are used to operate the two early morning Sunrise Shuttle services that serve East Boston, Winthrop, and Revere. Massport continues to provide outreach to employees about commute options. For employees who reside in neighborhoods and communities closer to the Airport, bicycle parking options have increased with bicycle racks offered at Terminal A, Terminal E, the Economy Garage, the Green Bus Depot, the Rental Car Center, the Logan Office Center, and the Signature general aviation terminal. Massport is also investigating ways to improve safer bicycle access to/around Logan Airport facilities.
Reduce congestion related to increasing use of RideApps	As of December 2019, Massport relocated most RideApp drop-off/pick-up activity to the ground floor of the Central Parking Garage complex, with the exception of drop-off at terminal curbs during the 4:00 AM to 10:00 AM peak departure period. Massport provides specific curbside locations at each terminal for drop-off/pick-up accommodations for persons with disabilities.
Increase the overall efficiency of the MBTA through interagency coordination	Massport participates in the Boston Metropolitan Planning Organization (MPO) to promote planning and funding of transportation system options that enhance access to the Airport. Massport and the MBTA have worked together on several initiatives including the renovated Blue Line Airport Station and the Silver Line bus service to Logan Airport. Massport has also partnered with the MBTA, the Massachusetts Department of Transportation (MassDOT), the City of Boston, and the Convention Center Authority in implementing transportation improvement plans recommended in the South Boston Waterfront, including sustainable transportation plans, as a means to improve the MBTA Silver Line access between South Station, the South Boston Waterfront, and the Airport.
Improve management of on-Airport ground access and infrastructure through technology	Massport disseminates ground access and parking information through the Internet (www.massport.com), social media (Twitter and Facebook), a toll-free telephone number (1-800-23-LOGAN), Smartraveler, and in-Airport kiosks. Massport's redesigned website has an interactive tool that helps users access Logan Airport, while providing multimodal options.

Source: Massport.

This Page Intentionally Left Blank.

6

Noise Abatement

This *2020/2021 Environmental Data Report* (EDR) focuses on calendar years 2020 and 2021. Due to the effects of the COVID-19 pandemic, those two years are unusual in comparison to trends seen in the preceding decades. Beginning in March 2020, flights in and out of Boston Logan International Airport (Logan Airport or the Airport) dramatically declined and passenger levels dropped by over 90 percent compared to 2019 levels for much of the spring and summer of 2020. While activity levels began a slow recovery in mid-summer 2020, the ongoing waves of COVID-19 cases resulted in continued low levels of activity for the rest of 2020 and into 2021. For calendar year 2020, total flight operations were only approximately 48 percent of the 2019 activity levels. Calendar year 2021 total flight operations rebounded somewhat, but still reached only approximately 62 percent of the 2019 activity levels.

Due to the pandemic, several airlines accelerated the retirement of older, louder, and less efficient aircraft models such as the Airbus A330-200/300 and A340, Boeing 747, 757, and 767, McDonnell Douglas MD-88, Embraer 190, and the smaller Bombardier CRJ200 regional jet (RJ). The effects of the airline fleet changes on the Logan Airport noise environment started to be seen in 2021 and should be more apparent in following years.

Key Findings for 2020 and 2021

- Annual aircraft operations decreased approximately 52 percent from 427,176 operations in 2019 to 206,702 in 2020 due to the pandemic. Operations increased in 2021 to 266,034 but still well below 2019 (pre-pandemic) levels (approximately 38 percent less).
- The total number of people residing within the 2020 day-night average sound level (DNL) 65 decibel (dB) contour (804 people) represents a decrease of almost 91 percent compared to the 2019 estimate (8,665 people). The 2021 population estimate within the DNL 65 contour totaled 2,497 people, which is about 29 percent of 2019. The primary factor affecting the size of the DNL contours is the reduced number of aircraft operations.
- The 2021 DNL contours are similar in shape to the 2019 DNL contours but reduced in size due to the reduction in operations. The 2020 DNL contours have a slightly different shape and are slightly smaller than 2021 over East Boston and Winthrop. The population within the 2020 DNL 65 dB contour is mainly located in Revere, Winthrop (Point Shirley) and Boston (Orient Heights). Compared to 2020, the 2021 DNL contour includes more homes, and therefore greater population, in each of those areas, as well as some in East Boston (Eagle Hill).
- Massport closed Runway 9-27 for about 75 days in 2020 from late May until mid-August for a runway rehabilitation and safety improvement project, taking advantage of the historically low aircraft operation levels to accelerate the necessary work. Completing the project ahead of the original schedule (originally planned from late August to late October 2020) minimized temporary disruptions to airfield operations and any potential shifts in flight patterns to other runways.
- The fleet mix of aircraft at Logan Airport continues to be composed of aircraft types with newer and quieter engine technology as defined in the Code of Federal Regulations (CFR) Title 14 Part 36, *Noise Standards: Aircraft Type and Airworthiness Certification* (Stage 5 airplanes are the quietest). About 29 percent of 2020 and 2021 operations were conducted in aircraft meeting the requirements for Stage 5 certification, 69 percent meeting Stage 4 certification, and the remaining 2 to 3 percent meeting only Stage 3 certification.
- Nighttime operations represented approximately 13 percent of total operations in both 2020 and 2021. Reflecting the overall drop in operations, total nighttime flights (commercial and cargo) decreased from an average of 195 per night in 2019 to 76 per night in 2020 and 98 per night in 2021. While nighttime operations in commercial passenger aircraft operations decreased, nighttime cargo operations increased from 2019 to 2020, most likely due to an increased demand for shipping during the pandemic. Most nighttime operations (about 86 percent in 2020 and 78 percent in 2021), occurred either before midnight or after 5:00 AM.
- Massport replaced 29 of the 30 monitors in the permanent noise monitoring system surrounding Logan Airport as part of the Noise and Operations Monitoring System (NOMS) upgrade that was started in 2019.
- Massport continues to seek funding for noise mitigation of properties that are eligible to participate in its Residential Sound Insulation Program (RSIP). In 2021, Massport updated its Noise Exposure Map (NEM) and is initiating a new program to sound insulate eligible homes and re-evaluate sound insulation in homes treated prior to 1993. To date, Massport has provided sound insulation for a total of 36 schools and 11,515 residential units with over $170 million invested since the start of the program.
- Massport completed a multi-year effort with Massachusetts Institute of Technology (MIT) and Federal Aviation Administration (FAA) to identify opportunities to reduce noise through changes to performance-based navigation (PBN) procedures and flight performance modifications. This is a first-in-the-nation project between the FAA and an airport operator to better understand the implications of PBN and evaluate strategies to address community concerns.

Introduction

Massport works to minimize the noise effects of Airport operations on its neighbors through a variety of noise abatement programs, procedures, studies, and other tools. At Logan Airport, Massport implements one of the longest-standing and most extensive noise abatement programs of any airport in the nation. Massport's comprehensive noise abatement program includes a dedicated Noise Abatement Office; an industry leading Noise and Operations Monitoring System (NOMS); residential and school sound insulation programs; time of day and runway restrictions for noisier aircraft; ground run-up procedures; and flight tracks designed to optimize over-water operations (especially during nighttime hours). The public can register noise complaints by phone or online through Massport's website.[1]

Massport's Noise Abatement Office is responsible for implementing noise abatement measures and generally monitoring community complaints and other aspects of the noise effects from Logan Airport operations. In addition to the initiatives listed above, highlights of activities that Massport has pursued in 2020 and 2021 as part of its noise program include:

- Encouraging voluntary use of reduced-engine taxiing when appropriate and safe.
- Working with the Federal Aviation Administration (FAA) to upgrade first-generation sound insulation windows through re-evaluation of the windows' effectiveness as part of the re-start of the Residential Sound Insulation Program (RSIP).
- Continuing improvement of the NOMS. Massport upgraded the system in 2019 and continues to invest in maintaining the system including installing new field monitors and infrastructure where needed. The total replacement of noise monitoring equipment at 29 sites around Logan Airport was completed in August 2021.
- Continuing 24-hour prohibitions on the use of Runway 4L for jet departures and Runway 22R for jet arrivals and prohibiting operations departing Runway 4L or arriving on Runway 22R between 11:00 PM and 6:00 AM.
- Continuing efforts to route late-night operations over water rather than over noise-sensitive land uses, including the continued preferential use of Runway 15R for late-night departures and Runway 33L for late-night arrivals.
- Continuing restriction on nighttime engine run-ups and use of aircraft auxiliary power units (APUs).
- Completion of the RNAV (Area Navigation) study which resulted in four procedures being put forth for implementation.

This chapter describes the runway use, fleet mix, level of operations, noise levels, and modeled noise conditions at Logan Airport related to aircraft operations during 2020 and 2021 and compares the findings to those for 2019 and selected prior years.

Noise conditions for 2020 and 2021 were assessed primarily through detailed computer modeling further described below, supplemented by the analysis of measured noise levels from Logan Airport's noise monitoring system. Noise analysis results include annual DNL noise contours and estimates of the population residing

1 Massport. Noise Complaints. http://www.massport.com/logan-airport/about-logan/noise-abatement/complaints/.

within various increments of noise exposure for 2020 and 2021. This chapter also includes a comparison of the modeled results with measured levels for 2020 and 2021 from the noise monitoring system. Supplemental noise metrics include Logan Airport's Cumulative Noise Index (CNI), Time Above (TA) various threshold sound levels, and periods of dwell and persistence of noise levels to provide a better understanding of the noise environment. Massport also provides a progress report on ongoing noise abatement measures and noise abatement initiatives affecting Logan Airport.

Appendix H, *Noise Abatement*, provides details on historical aircraft operations, runway use, the population exposed to DNL 65 dB or greater, and the status of the sound insulation program since 1990. Total runway use from all operations, usage by runway end, and DNL levels at 2020 U.S. Census block group locations are included. Appendix H also contains the *Flight Track Monitoring Report* for 2020 and 2021 and a *Fundamentals of Acoustics and Environmental Noise* section, which provides an overview of acoustics and noise terminology as well as background information relating to the effects of noise on human activity and community annoyance.

Noise Metrics

The common metrics used in this chapter to describe and evaluate aircraft noise are:

- **Decibel (dB)** – dB is the unit of sound pressure level (SPL), the standard measure for sound. It is a logarithmic quantity reflecting the ratio of the pressure of the sound source of interest and a reference pressure. The range of SPL extends from about 0 dB for the quietest sounds that one can detect to about 120 dB for the loudest sounds we can hear without pain. Many sounds in our daily environment have SPL on the order of 30 to 100 dB.
- **"A"-weighted decibel (dBA)** – This metric applies frequency weighting (A-weighting) to the SPL to approximate the sensitivity of the human auditory system. Human hearing is less sensitive to both low and high frequency components of sound and most sensitive to mid-frequency sounds.
- **Day-Night Average Sound Level (DNL)** – The DNL is a measure of the cumulative noise exposure over a 24-hour day. It is the 24-hour, logarithmic (or energy) average. DNL treats nighttime noise differently than daytime noise; for the A-weighted sound pressure levels occurring at night (between 10:00 PM and 7:00 AM), a 10-dB weighting is applied to the nighttime event to reflect the greater sensitivity to nighttime sound. DNL is the FAA's recommended metric for assessing noise and land use compatibility.[2]
- **Time Above (TA)** – The TA metric describes the total number of minutes that instantaneous sound levels (usually from aircraft) are above a given threshold. For example, if 65 dB is the specified threshold, the metric would be referred to as "TA65." The TA metric is typically associated with a 24-hour average annual day but can be used to represent any time period. The TA calculation can use any threshold. For this study, each of the monitoring sites report TA65, TA75, and TA85 results.
- **Effective Perceived Noise Level (EPNL)** – The EPNL calculation uses a time series of "tone corrected" perceived noise levels, reported in units of EPNdB. The tone corrected perceived noise level is determined by measuring the perceived noise level and adding to that value a "pure-tone" correction

2 14 Code of Federal Regulations Part 150, Appendix A to Part 150 Noise Exposure Maps, Sec. A150.101(b).

of up to 6 dB. The EPNdB is an international standard metric for the noise certification of aircraft and is part of the calculation of CNI[3] for this report.

For a more in-depth description of noise metrics, refer to Appendix H, *Noise Abatement*.

In 2015, the FAA began a multi-year research effort to study the relationship between aircraft noise exposure and its effects on communities around airports.[4] This was the most comprehensive study using a single noise survey ever undertaken in the United States, polling more than 10,000 residents living in communities surrounding 20 airports nationwide. The results of this study were released in January 2021.[5] The FAA received over 4,000 public comments. Further details on this study can be found in Appendix H, *Noise Abatement*. The FAA Reauthorization Act of 2018 under Section 188 and 173, required FAA to complete the evaluation of alternative metrics to the DNL standard within one year. The Section 188 and 173 Report to Congress was delivered on April 14, 2020,[6] and concluded that while no single noise metric can cover all situations, DNL provides the most comprehensive way to consider the range of factors influencing exposure to aircraft noise. In addition, use of supplemental metrics is both encouraged and supported to further disclose and aid in the public understanding of community noise impacts. In line with this conclusion, as Massport has historically done, the *2020/2021 EDR* provides DNL noise results along with various supplemental metrics such as CNI, TA, and Time Above Night.

Regulatory Framework

Appendix H, *Noise Abatement,* provides the noise regulatory framework that this *2020/2021 EDR* follows. Regulations discussed include:

- *Logan Airport Noise Abatement Rules and Regulations (Noise Rules)*:[7] The Noise Rules have been in effect since 1986. The Noise Rules place restrictions on certain aircraft and ground operations by time of day and runway, subject to implementation by FAA with regard to airport and airspace safety.
- *Federal Aviation Regulation (FAR) Part 36*: This regulation specifies the metrics, methods, and reporting required for aircraft noise certification.
- *FAR Part 150*: This regulation provides a process and guidance for voluntary FAA-sponsored noise assessment and abatement programs at airports.
- *FAR Parts 91 and 161*: These regulations address noise-related restrictions on aircraft operations.

3 Cumulative Noise Index (CNI) is a metric developed specifically for Logan Airport and defined in the Logan Airport Noise Rules. A description of this metric and the results for 2020 and 2021 are provided later in this chapter and Appendix H.

4 U.S. Department of Transportation, Federal Aviation Administration. Press Release – "FAA To Re-Evaluate Method for Measuring Effects of Aircraft Noise," May 7, 2015, https://www.faa.gov/news/press_releases/news_story.cfm?newsId=18774.

5 U.S. Department of Transportation, Federal Aviation Administration. Analysis of the Neighborhood Environmental Survey, Report No. DOT/FAA/TC-21/4, January 2021, Final Report, updated February 2021.

6 U.S. Department of Transportation, Federal Aviation Administration. *Report to Congress: FAA Reauthorization Act of 2018 (Pub. L. 115-254) Section 188 and Sec 173*, April 14, 2020, https://www.faa.gov/about/plans_reports/congress/media/Day-Night_Average_Sound_Levels_COMPLETED_report_w_letters.pdf.

7 Massachusetts Port Authority, *Logan International Airport Noise Abatement Rules and Regulations*, effective July 1, 1986, codified at 740 Code of Massachusetts Regulations (CMR) 24.01 et seq.

Noise Modeling Process

The sections below provide an overview of the noise modeling methodology and assumptions used in this *2020/2021 EDR*. For this noise assessment, Massport used the FAA-required aviation environmental design tool (AEDT) model, version 3d. The DNL, CNI, and TA noise metrics reported annually by Massport provide a means of understanding and comparing Logan Airport's noise environment from one year to the next. The numbers of operations, types of aircraft operating during the day and at night, use of various runway configurations, and the location and frequency of flight paths to and from the Airport all influence the noise environment. Change in any one operational parameter from one year to the next can cause changes in the values of the noise metrics and alter the shape of the noise exposure contours that represent the accumulation of noise events during an average annual day.

Massport continues to make use of current developments in the noise modeling process each year as technologies improve. The following technologies and techniques were employed for the 2020/2021 noise analysis:

- Massport's NOMS provided all available radar data for modeling and noise measurement data for reporting.[8]
- The flight operations data from the NOMS included detailed information with each flight record, such as aircraft registration numbers, wherever possible, which allowed for the assignment of the modeled AEDT aircraft type based on the specific aircraft and engine combination used on each flight at Logan Airport during 2020 and 2021.
- The modeling process included continued use of U.S. Geological Survey digital terrain data. AEDT uses the detailed terrain data to evaluate each receptor location at its proper elevation, which enhances the accuracy of the results.
- The population data analysis employed Geographic Information System (GIS) technology to calculate proportional estimates from 2020 U.S. Census[9] block group data, refining the accuracy of those counts.
- A proprietary AEDT pre-processor that prepares large quantities of radar data for processing by AEDT was used. Standard AEDT analyses (without the pre-processor) rely on assigning all operations to a limited number of prototypical or representative tracks, apply a generalized distribution for runway usage and day/night split, and rely on other aggregated data for choice of modeled aircraft type and flight profile. Use of the AEDT pre-processor improves the precision of modeling by:
    - Providing greater detail than standard AEDT analyses through the use of individual flight tracks taken directly from the radar system rather than relying on consolidated, representative flight tracks data.
    - Automating the production of noise contours directly from each individual radar trace. For 2020, 206,789 traces were collected and 205,834 retained enough information to be converted by the pre-processor into AEDT flight tracks. For 2021, 264,878 traces were collected and

8 The noise measurement data are only used for reporting and are not used to calibrate the noise model.

9 The 2020 US Census data became available in late 2021. For the previous decade, 2010 US Census data was used for the Logan Airport population data analyses.

263,942 retained enough information to be converted into AEDT. Each radar trace was converted to a model track, ensuring that the lateral dispersion of radar tracks was retained in the modeling. The operations on these radar traces were then scaled to account for all the 206,702 operations in 2020 and the 266,034 operations in 2021.

- Modeling each operation for the actual time of day and on the specific runway that it actually used, rather than applying a generalized distribution to broad ranges of aircraft types.
- Selecting the specific airframe and engine combination to model, on an operation-by-operation basis, based on the aircraft registration or a published composition of the fleets of the specific airlines operating at Logan Airport.
- Capturing the introduction of new aircraft types and the contraction and expansion of flight schedules.
- Using each flight's origin and destination to select the proper stage length.
- Using each aircraft's actual altitude profile to select from the available flight profiles for each aircraft type in the AEDT database.

Noise Model Inputs

Appendix H, *Noise Abatement*, contains detailed information about the noise model in the section titled *AEDT Noise Analysis*. The following sections summarize the average-day operations as used in the noise modeling and compare 2020 and 2021 inputs to the inputs for 2019.

Fleet Mix

Since 2004, Massport has relied primarily on radar data as the main source of input for noise calculations, because radar data are typically more accurate than the information reported by airlines. The radar data produces a list of approximately 500 different aircraft types that use Logan Airport during a year, including the large passenger and cargo jets operated by air carriers, as well as the wide variety of small corporate jets and propeller aircraft flown by general aviation (GA) users.

The aircraft types identified by the radar data were matched to the types in the AEDT 3d database. The final list of modeled aircraft, used as an input to AEDT, is presented in detail in Appendix H, *Noise Abatement*. Massport reports operations summarized into several key categories: commercial (passenger and cargo) or GA operations; Stage 2, 3, 4 or 5 noise categories;[10] and turboprop or propeller (non-jet) aircraft. Additionally, aircraft operations are split into daytime and nighttime periods, where nighttime hours are defined as 10:00 PM to 7:00 AM. Operations occurring during nighttime hours incur a 10 dB weighting when included in the DNL modeling calculation.

Table 6-1 summarizes the number of average daily operations by category of aircraft operating at Logan Airport in 2020 and 2021 and provides comparison data for 2019 as well as for reference years 1990,

10 Stage 3, 4 and 5 categories include any aircraft that meet the requirements for the stage certification. Note that many aircraft originally certificated as Stage 3 or Stage 4 would in fact satisfy the newer Stage 4 and 5 criteria if recertificated. FAA does not require aircraft to be recertificated and FAA has no plans at this time to restrict Stage 3 operations. Massport does not have the regulatory authority to restrict aircraft using Logan Airport.

1998, 2000, and 2010, the year of peak operations at Logan Airport. Available data for each year prior to 2019 are included in Appendix H, *Noise Abatement*. Overall annual operations decreased dramatically from 427,176 operations in 2019 to 206,702 in 2020 due to the pandemic (an approximately 52 percent decrease). Annual operations then increased to 266,034 in 2021 but remained approximately 38 percent less than 2019 (pre-pandemic) levels.

Commercial Operations

As shown in **Table 6-1**, the majority of operations at Logan Airport are commercial (passenger, cargo, and charter) flights; commercial operations account for approximately 93 percent of total operations in 2020 and 91 percent in 2021. Flights by GA aircraft make up the remaining portion.[11] For 2020, operations by commercial air carrier jets decreased by about 53 percent compared to 2019, an average decrease of about 443 flights per day. In 2021, there was an increase of about 81 daily air carrier jet flights compared to 2020. However, there were still 362 fewer air carrier jet flights per day in 2021 compared to 2019 levels (approximately 56 percent less).

In 2020, commercial non-jet operations (by carriers such as Cape Air, Boutique Air, and Porter Airlines[12]) also decreased compared to 2019 due to the pandemic, but not in the proportions seen in the decrease of commercial jet operations. Operations by commercial non-jets decreased by about 37 percent from 2019 to 2020, resulting in the share of operations for the commercial non-jet group to increase to about 14 percent of total operations (commercial and GA combined). In 2021, the commercial non-jet share was about 13 percent of total operations; still higher than the approximately 11 percent share seen in 2019 (pre-pandemic).

As noted in the *2018/2019 EDR*, the share of operations by RJ aircraft[13] at Logan Airport increased since 2017. From 2010 through 2016, the Logan Airport fleet showed a continuous trend toward larger aircraft, with steady decreases in the share of RJ operations. However, from 2017 to 2019, operations by RJs at Logan Airport increased by about 25 percent. As in all categories, RJ operations decreased as a result of the pandemic from 2019 to 2020 but maintained their approximate share (12 percent) of commercial operations (11 percent of total operations). From 2020 to 2021, that share increased to about 16 percent of commercial operations as routes that were paused during the pandemic became active using RJ aircraft to start.

Figure 6-1 presents the commercial aircraft operations by category in terms of percent of the total for each year from 2010 through 2021. This figure demonstrates the decrease in commercial non-jet operations after 2000 and the more recent rise of the RJ category in the fleet mix. As shown in **Table 6-1** and **Figure 6-1**, air carrier jets continue to make up over 70 percent of commercial operations in 2020 and 2021 as they did in 2019.

11 For 2021, GA flights represented 9 percent of the total, an increase from the 7 percent seen in 2018, 2019, and 2020.

12 Cape Air and Boutique Air were able to continue operations throughout the pandemic, but Porter Airlines, based in Canada, did not fly at Logan Airport from March 2020 until fall 2021.

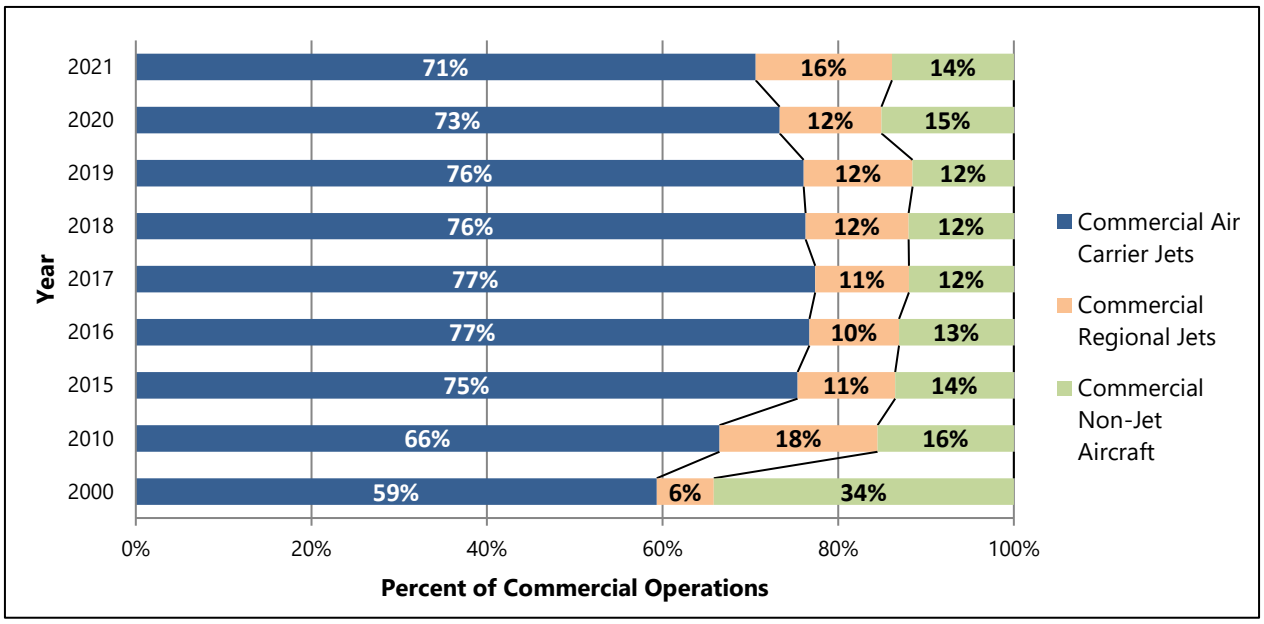
13 RJs are defined as those aircraft with 90 or fewer seats, consistent with the categorization in Chapter 2, *Activity Levels*.[13] For years prior to 2010, the RJs in EDRs and ESPRs were classified as aircraft with fewer than 100 seats. When RJs first started gaining popularity, the aircraft types available were typically 50 seats or fewer with the traditional air carrier jet being 100 seats and higher. As newer aircraft types have become available, the smaller 35- to 50-seat types have been replaced by 70- to 99-seat types, with the 90 and above seat types flying many of the traditional air carrier routes. Therefore the 90 seat and higher aircraft types are classified as air carrier.

Table 6-1 Modeled Average Daily Operations by Commercial and General Aviation (GA) Aircraft[1]

		1990[2,3]	1998	2000[4]	2010[5]	2017	2018	2019	2020	2021	Change 2019 to 2020	Change 2019 to 2021
Commercial Aircraft Operations (Passenger and Cargo)												
Air Carrier Jets	Day	601.3	626.4	649.0	521.6	636.0	657.2	655.6	319.0	382.7	-51.3%	-41.6%
	Night[6]	77.2	101.5	99.8	94.0	148.8	164.1	174.3	68.4	85.2	-60.8%	-51.1%
	Total	**678.5**	**727.8**	**748.7**	**615.6**	**784.8**	**821.3**	**829.9**	**387.4**	**467.9**	**-53.3%**	**-43.6%**
Regional Jets	Day	N/A[2]	N/A[2]	78.1	152.6	98.4	113.4	123.5	57.4	95.9	-53.5%	-22.3%
	Night[6]	N/A[2]	N/A[2]	3.9	13.9	9.7	13.1	11.9	3.8	7.2	-68.2%	-39.4%
	Total	**N/A[2]**	**N/A[2]**	**82.0**	**166.6**	**108.2**	**126.5**	**135.4**	**61.2**	**103.1**	**-54.8%**	**-23.8%**
Commercial Non-Jets	Day	444.4	552.6	409.6	138.5	119.0	126.8	124.1	79.3	91.7	-36.1%	-26.1%
	Night[6]	11.7	21.9	21.6	5.2	2.2	2.4	1.7	0.3	0.2	-80.1%	-86.0%
	Total	**456.1**	**574.4**	**431.2**	**143.7**	**121.3**	**129.1**	**125.8**	**79.7**	**91.9**	**-36.7%**	**-26.9%**
Total Commercial Operations	Day	1,045.7	1,178.9	1,141.8	812.8	853.5	897.4	903.2	455.8	570.3	-49.5%	-36.9%
	Night[6]	89.0	123.3	125.5	113.1	160.7	179.5	187.9	72.5	92.7	-61.4%	-50.7%
	Total	**1,134.7**	**1,302.2**	**1,267.4**	**925.9**	**1,014.2**	**1,076.9**	**1,091.1**	**528.3**	**663.0**	**-51.6%**	**-39.2%**
GA Aircraft Operations												
GA Jets	Day	N/A[3]	35.8	47.4	28.1	52.2	55.8	53.2	25.3	46.0	-52.4%	-13.6%
	Night[6]	N/A[3]	4.6	3.9	3.3	4.6	5.1	4.8	2.4	3.7	-50.4%	-23.0%
	Total	**N/A[3]**	**40.4**	**51.2**	**31.3**	**56.8**	**60.9**	**58.0**	**27.7**	**49.7**	**-52.2%**	**-14.3%**
GA Non-Jets	Day	N/A[3]	37.3	34.6	8.2	26.4	22.0	19.4	9.5	15.1	-50.8%	-22.0%
	Night[6]	N/A[3]	16.3	1.8	0.7	2.3	1.9	1.9	0.7	1.1	-60.9%	-42.3%
	Total	**N/A[3]**	**53.57**	**36.4**	**8.9**	**28.7**	**23.9**	**21.3**	**10.3**	**16.2**	**-51.7%**	**-23.8%**
Total GA Operations	Day	N/A[3]	73.1	81.9	36.3	78.6	77.8	72.5	34.8	61.1	-52.0%	-15.8%
	Night[6]	N/A[3]	20.9	5.7	4.0	6.8	7.0	6.7	3.1	4.8	-53.4%	-28.5%
	Total	**N/A[3]**	**94.0**	**87.6**	**40.2**	**85.4**	**84.8**	**79.2**	**38.0**	**65.9**	**-52.1%**	**-16.9%**
Total Aircraft Operations												
Combined Commercial and GA	Day	1,045.7	1,252.0	1,223.8	849.0	932.1	975.2	975.7	490.6	631.4	-49.7%	-35.3%
	Night[6]	89.0	144.2	131.2	117.1	167.5	186.5	194.6	75.7	97.5	-61.1%	-49.9%
	Total[3]	**1,134.7**	**1,396.2**	**1,355.0**	**966.1**	**1,099.6**	**1,161.7**	**1,170.3**	**566.3**	**728.9**	**-51.6%**	**-37.7%**

Source: Massport's Noise Monitoring System, Revenue Office, and HMMH, 2022.
Notes: Totals and percentages may not add exactly due to rounding.
1 Operations include scheduled and unscheduled operations. Data for other years are available in Appendix H, *Noise Abatement*.
2 Regional Jets (RJs) were not tracked separately prior to 2000.
3 Totals prior to 1998 do not include GA operations.
4 Prior to 2010, the split between air carrier jets and RJs is 100 seats with RJs having less than 100 seats.
5 Since 2010, the split between air carrier jets and RJs is 90 seats with RJs having less than 90 seats.
6 Nighttime operations occur between 10:00 PM and 7:00 AM.

Figure 6-1 Fleet Mix of Commercial Operations (Passenger and Cargo) at Logan Airport



Source: HMMH, 2022.
Notes: Includes both passenger and cargo operations.
Since 2010, the split between air carrier jets and regional jets (RJs) is 90 seats with RJs having fewer than 90 seats.
Prior to 2010, the split between air carrier jets and RJs was 100 seats with RJs having fewer than 100 seats.
The share of RJs as a percentage of the commercial fleet was not tracked prior to 2000.

FAA Jet Aircraft Noise Categories

Aircraft noise standards for all jet aircraft in the U.S., including those currently operating at Logan Airport, are defined in the Code of Federal Regulations (CFR) Title 14 Part 36, *Noise Standards: Aircraft Type and Airworthiness Certification* (14 CFR Part 36).[14] In accordance with 14 CFR Part 36, jet aircraft are categorized according to their noise emission levels in FAA Advisory Circular 36-1H, *Noise Levels for U.S. Certificated and Foreign Aircraft*, as either Stage 3, Stage 4, or Stage 5.[15] The oldest and noisiest aircraft, Stage 1, were phased out of service in the 1980s. The FAA banned Stage 2 aircraft operations in the contiguous U.S. as of December 31, 2015, and recently adopted the highest (quietest) standard of noise classification called Stage 5. Stage 5 aircraft are certificated as a cumulative 17 dB below Stage 3 standards and are effective for new aircraft type certification after December 31, 2017, or December 31, 2020, depending on the weight of the aircraft.[16] Appendix H, *Noise Abatement*, provides more detail on the aircraft stage designations regulated by 14 CFR Part 36 and the regulatory framework governing aircraft noise.

Examples of Stage 3, Stage 4, and Stage 5 aircraft types operating at Logan Airport in 2020 and 2021 are shown in **Table 6-2**. As shown in the table, noise levels are lower with each successive stage of aircraft design. The

14 Code of Federal Regulations (CFR) Title 14 Part 36, *Noise Standards: Aircraft Type and Airworthiness Certification*, as amended.
15 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 36-1H, *Noise Levels for U.S. Certificated and Foreign Aircraft*, Change 1, May 25, 2012.
16 The Stage 5 Final Rule was published on October 5, 2017. https://www.federalregister.gov/documents/2017/10/04/2017-21092/stage-5-airplane-noise-standards.

regulation provides a Stage 3 noise limit for each aircraft that is dependent on the aircraft's weight. A cumulative level, determined by summing the certification lateral, flyover, and approach values, can be compared against the permissible limit. The columns on the right side of **Table 6-2** show this sum, the noise limit for that aircraft, and the dB difference. The Stage 5 aircraft shows the greatest difference, at over 25 dB below the Stage 3 limit.

Table 6-2 Example Stage 3, Stage 4, and Stage 5 Aircraft Types Operating at Logan Airport

Aircraft Name	Aircraft/Engine Model	Aircraft Noise Stage Equivalent	Cumulative Noise Level (dB)[1]	Stage 3 Noise Limit (dB)	Difference (dB)	Percent Below Limit
Embraer 175	EMB175	3	272.8	282.0	9.2	3.3%
Boeing 737-700	CFM56-7B22	4	274.1	288.1	14.0	4.9%
Airbus 220-300	PW1524G-3	5	262.9	288.2	25.3	8.8%

Source: EASA MAdB Jets (200213) Certification data: https://www.easa.europa.eu/domains/environment/easa-certification-noise-levels
1 Cumulative levels include lateral, overflight, and approach noise.

Due to noise differences among aircraft, Massport tracks operations by aircraft certification/stage. **Table 6-3** provides the percentage of commercial jet operations by stage for the past three years with 1990, 1998, 2000, and 2010 also reported for historical context. As noted in **Table 6-3**, about 98 percent of the 2020 and 2021 commercial jet fleet at Logan Airport meets at least Stage 4 certification requirements. About 29 percent of Logan Airport's commercial jet fleet met the requirements for certification in the FAA's newest noise category, Stage 5, for both 2020 and 2021. **Table H-3** in Appendix H, *Noise Abatement*, provides data for every year since 1998.

Table 6-3 Percentage of Commercial Jet Operations by 14 CFR Part 36 Stage Category

Year[1]	Meeting Stage 5 Requirements[5]	Meeting Stage 4 Requirements[2]	Certificated Stage 3	Recertificated Stage 3[3]	Stage 2 (Greater than 75,000 lbs.)	Total
1990	N/A	N/A	51.1%	0.0%	48.9%	100%
1998	N/A	N/A	65.9%	21.7%	12.4%	100%
2000	N/A	N/A	75.0%	24.0%	1.0%	100%
2010	N/A	93.2%	5.7%	1.1%[4]	0.0%	100%
2019	15.2%	82.9%	2.0%	0.0%	0.0%	100%
2020	28.5%	68.7%	2.8%	0.0%	0.0%	100%
2021	29.1%	69.2%	1.7%	0.0%	0.0%	100%

Source: Massport's Noise Monitoring System, Revenue Office, and HMMH 2022.
Notes: Totals and percentages may not add exactly due to rounding.
1 Data for all years beginning in 1998 are available in Appendix H, *Noise Abatement*.
2 Aircraft counted as Stage 4 are aircraft that are certificated Stage 4 or would qualify if recertificated. Certificated Stage 4 aircraft became available in 2006 and the level of aircraft meeting Stage 4 requirements was not determined prior to 2009.
3 Recertificated Stage 3 aircraft are aircraft originally manufactured as a certificated Stage 1 or 2 aircraft under Federal Aviation Regulation (FAR) Part 36 that either have been retrofitted with hush kits or have been re-engined to meet Stage 3 requirements.
4 In 2010, only one commercial carrier with more than 100 annual operations continued to use recertificated Stage 3 aircraft at Logan Airport (FedEx). A few charter operators also used these aircraft.
5 Aircraft counted as Stage 5 are aircraft that are certificated Stage 5 or would qualify if recertificated. Stage 5 aircraft certification was available beginning in 2018 for aircraft with a maximum certificated takeoff weight greater than 121,254 pounds. The level of aircraft that meet Stage 5 requirements was not determined prior to 2016.

Nighttime Operations

Massport monitors flights that operate during the DNL nighttime period of 10:00 PM to 7:00 AM, when each modeled flight is increased by 10 dB in calculations of noise exposure. **Table 6-4** shows this nighttime activity by different groups of aircraft. Commercial jet nighttime operations decreased from an average 186 operations per night in 2019 to approximately 72 per night in 2020 and then increased to approximately 92 per night in 2021. Commercial non-jet and GA nighttime operations also both decreased by more than half from 2019 to 2020, with GA nighttime activity rebounding somewhat in 2021, but commercial non-jet nighttime activity decreasing further. Nighttime operations represented approximately 13 percent of total operations for both 2020 and 2021 at Logan Airport. For reference, in 2019, nighttime operations represented approximately 17 percent of operations.

Changes in overall nighttime operations counts generally parallel the changes in overall activity due to the pandemic. Total nighttime operations decreased approximately 61 percent from 2019 to 2020, and from 2020 to 2021 nighttime operations increased approximately 29 percent. However, nighttime cargo operations accounted for approximately 5 percent of all commercial nighttime operations in 2019; that percentage increased to 13 percent for 2020 and was 9 percent for 2021.

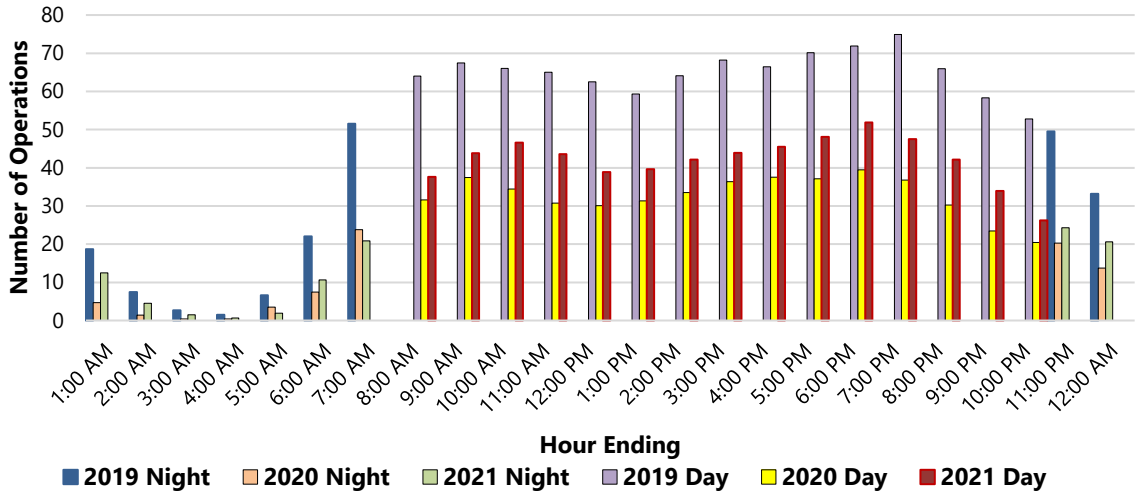
As in years past, the majority of nighttime operations (between 10:00 PM and 7:00 AM) occurred either before midnight or after 5:00 AM, as shown in **Figure 6-2**, to accommodate connecting flights and international time zones. The proportion occurring between 10:00 PM and midnight or between 5:00 AM and 7:00 AM was approximately 81 percent of total nighttime operations in 2019, 86 percent in 2020, and 78 percent in 2021.

Table 6-4 Modeled Nighttime Operations (10:00 PM to 7:00 AM) at Logan Airport Per Night[1]

Year	Commercial Jets	Commercial Non-Jets	General Aviation	Total
1990	77.2	11.7	N/A[2]	89.0
1998	101.4	21.9	20.9[3]	144.2
2000	103.9	21.6	5.7	131.2
2010	107.9	5.2	4.0	117.1
2019	186.2	1.7	6.7	194.6
2020	72.2	0.3	3.1	75.7
2021	92.5	0.2	4.8	97.5
Change (2019 to 2020)	**-114.0**	**-1.4**	**-3.6**	**-119.0**
Percent Change	-61.2%	-80.1%	-53.4%	-61.1%
Change (2019 to 2021)	**-93.8**	**-1.5**	**-1.9**	**-97.2**
Percent Change	-50.4%	-86.0%	-28.5%	-49.9%

Source: Massport and L3Harris radar data; and HMMH, 2022.
Notes: Totals and percentages may not add exactly due to rounding.
1 Data for all years beginning in 1990 are available in Appendix H, *Noise Abatement*.
2 Totals prior to 1998 do not include general aviation (GA) operations.
3 1998 was the first year GA operations were reported and included in the total nighttime operations.

Figure 6-2 Logan Airport Average Hourly Operations, 2019 - 2021



Source: HMMH, 2022.

Runway Use

Logan Airport's runways are shown in **Figure 6-3**. Runway 15R-33L and Runway 4R-22L are Logan Airport's longest runways; each of these is just over 10,000 feet in length.

Runway use refers to the frequency with which aircraft use each of these runways during the year, as dictated or permitted by availability, wind, weather, aircraft performance, demand, and air traffic control. For noise abatement reasons, Runway 15R-33L is the preferred runway to use at night, with arrivals to Runway 33L and departures from Runway 15R (known as head-to-head procedures), to keep flights over Boston Harbor as much as possible and away from noise-sensitive land uses. Many of these flights do fly over North Shore or South Shore communities. but not until after reaching higher altitudes.

During other periods of the day, Runway 9 and 22R are used primarily for departures, and Runways 4R and 22L are used primarily for arrivals. Typically, Runways 15R, 27, and 33L are used for both arrivals and departures.

Runway 14-32 is unidirectional; there are no arrivals to Runway 14 and no departures from Runway 32. Additionally, Runway 14-32 can be used only during northwest or southeast wind conditions[17] when winds are 10 knots or greater. Under certain northwest wind conditions, Runway 32 provides FAA with a second arrival runway, thereby reducing delays at Logan Airport. Runway 14 is available for departures but is rarely used.

Runway 15L-33R is Logan Airport's shortest runway, at under 3,000 feet long. This runway is primarily used for small, non-jet aircraft arrivals.

17 The Runway 14-32 restrictions are a condition of the Logan Airside Improvements Project Record of Decision (ROD). Federal Aviation Administration (FAA) *Boston Logan Airport Noise Study Categorical Exclusion Record of Decision* (CATEX ROD), Issued October 16, 2007.

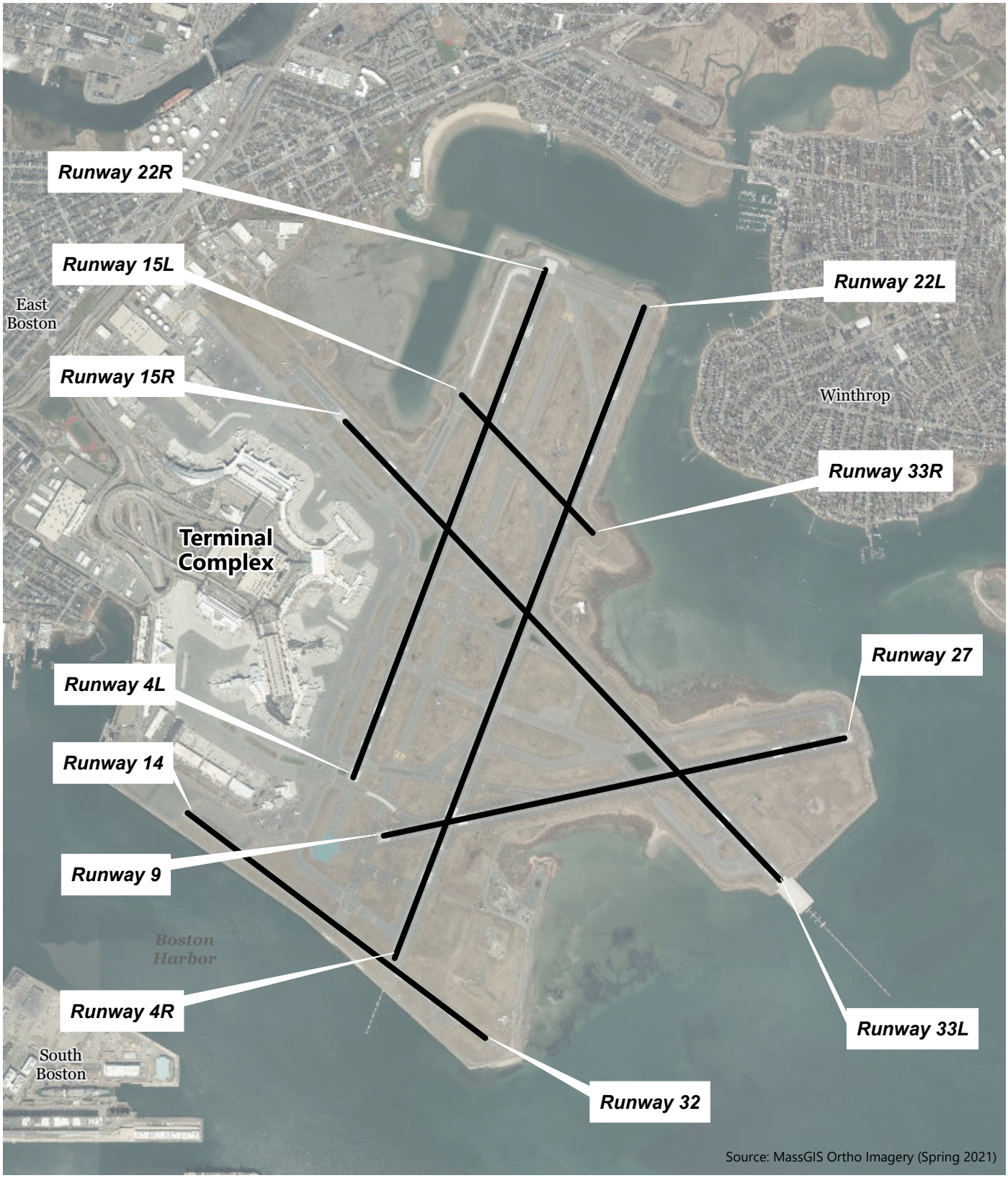


FIGURE 6-3 Logan Airport Runways

2020/2021 Environmental Data Report

0 500 1000 2000 Feet

Table 6-5 provides a summary of jet runway use conditions in 2020 and 2021, with recent years and historical years provided for comparison. Weather is the primary driver of runway use at Logan Airport. In 2020, Runway 9-27 was closed from late May until mid-August for a runway rehabilitation and safety improvement project.[18] There were no extended main runway closures in 2019 or 2021. Runway 14-32 was closed in 2021 from July to September.

The following compares the jet runway use in 2020 and in 2021 to 2019:

2019 to 2020

- For departures, the proportion of jets taking off from Runway 9 decreased from 2019 to 2020 due to the 2.5-month runway closure. The Runway 27 departure usage for 2020 was similar to the annual percentage for 2019, despite the closure. The share of jets taking off from all other departure runways, particularly Runways 15R and 22R, increased in 2020.
- The proportion of jet arrivals to Runways 15R, 22L, and 33L increased, while the proportions on Runways 4L, 4R and 27 decreased.

2020 to 2021

- For departures, use of Runway 9 was lower (at 24 percent) than the 30 percent seen 2019. The proportion of jet aircraft utilizing Runways 15R, 22R, 27 and 33L were all one or two percentage points higher in 2021 than 2019.
- For arrivals, the proportions of arrivals using Runways 15R, 22L, and 33L were higher than in previous years while the proportions landing on Runways 4L, 4R and 27 were lower.

Detailed runway usage for all aircraft types (jet and non-jet) for 2020 and 2021 is provided in Appendix H, *Noise Abatement*.

18 Massport was able to take advantage of the historically low flight activity and accelerate the runway rehabilitation and safety project: http://www.massport.com/massport/media/newsroom/massport-accelerates-runway-safety-work-at-logan-airport/.

Table 6-5 Summary of Annual Jet Aircraft Runway Use[1]

	Runway									
	4L	**4R**	**9**	**14[2]**	**15R**	**22L**	**22R**	**27**	**32[2]**	**33L**
1990										
Departures	0%	3%	21%	N/A	10%	2%	36%	20%	N/A	7%
Arrivals	1%	25%	0%	N/A	2%	14%	0%	28%	N/A	29%
1998										
Departures	0%	8%	35%	N/A	6%	5%	28%	14%	N/A	5%
Arrivals	2%	41%	0%	N/A	2%	7%	0%	28%	N/A	19%
2000										
Departures	0%	8%	35%	N/A	4%	3%	30%	15%	N/A	6%
Arrivals	4%	40%	0%	N/A	1%	7%	0%	28%	N/A	20%
2010										
Departures	0%	4%	28%	<1%	8%	2%	31%	10%	0%	17%
Arrivals	5%	28%	0%	0%	1%	15%	0%	32%	1%	16%
2019										
Departures	0%	4%	30%	0%	4%	2%	28%	12%	0%	20%
Arrivals	4%	28%	0%	0%	<1%	29%	<1%	22%	2%	15%
2020										
Departures	0%	5%	19%	0%	7%	2%	33%	13%	0%	21%
Arrivals	1%	23%	0%	0%	4%	36%	<1%	16%	1%	19%
2021										
Departures	0%	4%	24%	0%	6%	2%	29%	14%	0%	21%
Arrivals	1%	25%	0%	0%	3%	32%	<1%	17%	1%	20%

Source: Massport L3Harris radar data and HMMH, 2022.

Notes: These data reflect actual percentages of jet aircraft operations on each runway. They should not be confused with effective runway use.
Jet aircraft are not able to use Runway 15L or 33R due to its length of only 2,557 feet.
Totals may not add exactly due to rounding.

N/A Not available.

1 Data for all years beginning in 1990 are available in Appendix H, *Noise Abatement*.

2 Runway 14-32 opened in late November 2006. Runway 14-32 is unidirectional with no arrivals to Runway 14 and no departures from Runway 32.

Preferential Runway Advisory System (PRAS)

To provide an equitable distribution of Logan Airport's noise impacts on surrounding communities, in 1982 Massport developed the Preferential Runway Advisory System (PRAS). The system was enhanced in 1990 and in subsequent years. The two primary objectives of PRAS were to equitably distribute noise on an annual basis and to provide short-term relief from continuous operations over the same neighborhoods near the Airport.

PRAS consisted of two parts: (1) a set of specific runway use goals to address the PRAS objectives, and (2) a computer program that would provide runway configuration recommendations to air traffic controllers based on weather, traffic, and PRAS goals. In February 2004, the PRAS system was suspended due to an upgrade of the FAA radar system during the consolidation of the Boston Terminal Control Center at the new facility in Merrimack, New Hampshire.

During Phase 2 of the Boston Logan Airport Noise Study (BLANS), the Massport Community Advisory Committee (CAC) voted to abandon PRAS because it had not achieved the intended noise abatement.[19] Phase 3 of the BLANS focused on updating the Runway Use Program. Operational tests of a new program began in November 2014 and continued through September 2016. The BLANS project ended in 2016 without the CAC agreeing on a new Runway Use Program. A final BLANS project report was issued in April 2017.

Although PRAS is not in affect at Logan Airport, Massport continues to report on key PRAS statistics for public information purposes. **Table 6-6** provides the original PRAS goals, and a comparison of effective runway use[20] from 2016 to 2021. Massport also continues to collect and report data pertaining to PRAS's second objective: relief from continuous operations over the same neighborhoods near the Airport. The section of this chapter titled "Dwell and Persistence Reporting" presents that data.

19 BLANS Level 3 Screening Analysis, FAA, December 2012, Page E-2.

20 Effective usage refers to runway use which applies a factor of 10 to the night operations, similar to DNL.

Table 6-6 Effective Jet Aircraft Runway Use in Comparison to Preferential Runway Advisory System (PRAS) Goals

	PRAS Effective Usage Goals		2018 Effective Usage		2019 Effective Usage		2020 Effective Usage		2021 Effective Usage	
Runway End	**ARR**	**DEP**	**ARR**	**DEP**	**ARR**	**DEP**	**ARR**	**DEP**	**ARR**	**DEP**
4R/4L	21.1%	5.6%	26.3%	3.3%	24.0%	3.3%	20.4%	5.0%	21.6%	4.0%
9	0.0%	13.3%	0.0%	23.5%	0.0%	23.6%	0.0%	15.4%	0.0%	19.1%
15R	8.4%	23.3%	0.2%	10.5%	0.3%	9.2%	3.0%	11.2%	2.2%	14.8%
22L/22R	6.5%	28.0%	38.5%	35.3%	35.5%	30.3%	35.8%	32.0%	32.7%	25.9%
27	21.7%	17.9%	16.1%	12.8%	18.3%	15.5%	13.4%	14.4%	15.0%	12.4%
33L	42.3%	11.9%	18.3%	14.6%	21.3%	18.1%	26.9%	21.9%	28.3%	23.8%
14[1]	N/A	N/A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
32[1]	N/A	N/A	0.5%	0.0%	0.7%	0.0%	0.6%	0.0%	0.3%	0.0%

Source: Massport L3Harris radar data and HMMH, 2022.
Notes: PRAS goals are stated in terms of effective jet operations which exclude non-jet flights, but which multiply each nighttime (10:00 PM to 7:00 AM) operation by a factor of 10.
N/A Not available.
1 Runway 14-32 opened following the suspension of PRAS; consequently, PRAS goals were not established for this runway.

Flight Tracks

As described in the *Noise Modeling Process* section of this chapter, a data pre-processor imports data into AEDT. Instead of using representative model flight tracks, the AEDT pre-processor converts each radar track to an AEDT model track and then models the scaled operation on that track.[21] Appendix H, *Noise Abatement,* provides more information about this pre-processor. This allows Massport to account for runway closures and/or temporary or permanent airspace changes that occur during the year, events which would be much more difficult to accurately capture with conventional modeling methods.

For this *2020/2021 EDR*, 205,834 flight tracks were modeled to calculate the noise levels surrounding Logan Airport for calendar year 2020, and 263,942 flight tracks were modeled for 2021. **Figures 6-4** through **6-10** provide samples of the flight tracks used in AEDT to develop the DNL contours.[22] The figures show arrivals and departures throughout each year from a representative sample for each of three aircraft categories: air carrier jets, RJs, and non-jets. Different colors were used to plot the tracks from 2020 and 2021; as shown by the figures, the flight corridors for the two years are very similar. One notable change can be seen on **Figure 6-4**, in the air carrier jet departures from Runway 15R as they pass near Hull. The existing RNAV Standard Instrument Departure (SID) was modified to move flight tracks over water, further from Hull. The procedure was published in December 2021.

21 This method provides a one to-one correspondence of radar tracks to model tracks and ensures that the lateral and vertical dispersion of aircraft types are consistent with the radar data.

22 The flight tracks shown in these figures are a representative sample, selected uniformly from the complete track set to match the overall annual runway use.

By 2011, the implementation of RNAV departure and arrival procedures from the BLANS was completed. In addition to the RNAV procedures recommended from the BLANS study, other RNAV procedures implemented at Logan Airport (such as the RNAV arrivals into the terminal airspace) are part of a national FAA initiative, which was implemented to improve safety and efficiency in the airspace system. These procedures result in consolidated flight paths and greater predictability along the flight route. Similar procedures have been implemented at Denver, Minneapolis, Baltimore-Washington, Houston, Dallas, Chicago Midway, Phoenix, and Seattle Airports.

- **Figure 6-4** displays air carrier jet departures following the FAA RNAV departure procedures.
- **Figure 6-5** displays air carrier jet arrivals. The RNAV arrival procedures are very evident in the 2020 and 2021 modeled data, with a narrowing of the flight tracks into concentrated areas.
- **Figure 6-6** displays the RJ departures following the RNAV departure routes in the same manner as the larger air carrier jets.
- **Figure 6-7** displays the RJ arrivals, again resembling the patterns of the larger air carrier jets.
- **Figure 6-8** displays the non-jet departures. Non-jet aircraft tend to turn early off the runways, not following the jet departure routes. Non-jet departures from Runways 4L, 22R, 33L, and 27 are allowed to turn over residential areas, whereas the jet aircraft are not. This also keeps the non-jet aircraft out of the jet departure paths, allowing for efficient jet departures.
- **Figure 6-9** displays the non-jet arrivals. The Boston Harbor route for non-jet aircraft arriving to Runway 4L can be clearly seen. The graphic shows that non-jet arrivals use Runways 22R and 33R, which are not used by jets. Non-jet arrivals also use the other runways which do accommodate jets.
- **Figure 6-10** displays the nighttime jet arrivals using the Light Visual Approach[23] to Runway 33L. This is a procedure developed from the BLANS project, which is available only during visual conditions at night in which pilots can follow a route offshore to reduce noise impacts. These flights remain offshore and avoid overflying Cohasset and Hull at night. Flights arriving to Runway 33L from the west pass over Saugus and Nahant at a higher altitude and then head south over Boston Harbor to intersect with the visual approach procedure. Of the 4,770 nighttime jet arrivals to Runway 33L in 2020, approximately 21 used this procedure and of the 7,223 nighttime jet arrivals to Runway 33L in 2021, approximately 11 used this procedure. An RNAV visual approach procedure[24] developed by jetBlue Airways coincides with the final portion of the route of the Light Visual Approach. The RNAV visual approach procedure gives aircraft with advanced navigational capabilities a predictable approach to Runway 33L in visual conditions. This procedure is available to authorized airlines only.

Meteorological Data

AEDT has several settings that reflect aircraft performance profiles and sound propagation based on meteorological data. Meteorological settings include average temperature, dew point, barometric pressure, and relative humidity at the Airport. Massport obtained weather data for 2020 and 2021 from the National Oceanic and Atmospheric Administration's National Centers for Environmental Information and used the respective annual averages in modeling all 2020 and 2021 operations.

23 A Visual Approach procedure can only be used when weather conditions permit, and the pilots follow visual landmarks to follow the procedure.

24 Boston Logan Runway 33 Left Area Navigation (RNAV) Visual Flight Procedure Test CATEX, approved June 26, 2013.

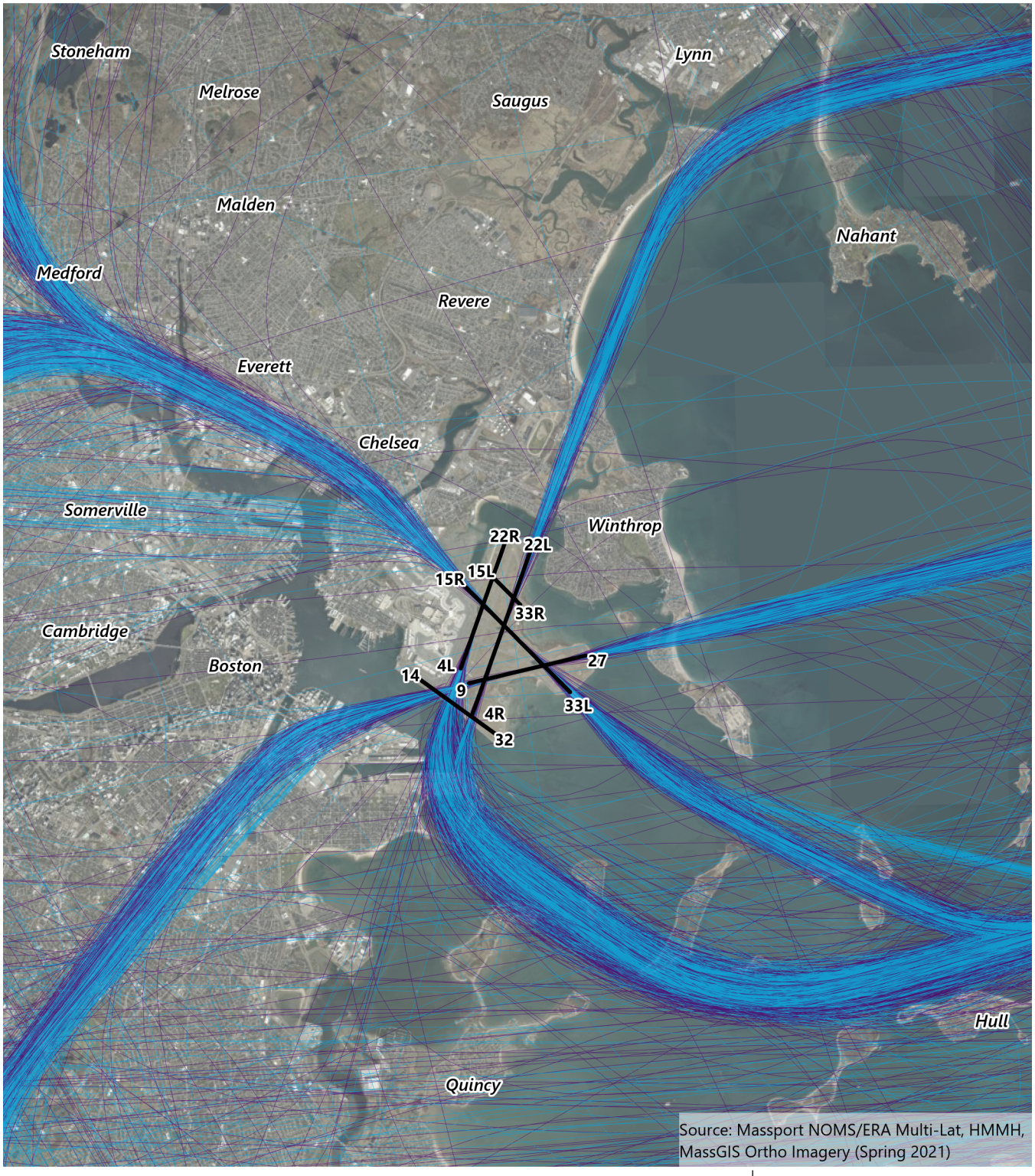


Figure 6-4 Air Carrier Departure Flight Tracks

2020/2021 Environmental Data Report

2020 Air Carrier Jet Departures

2021 Air Carrier Jet Departures

0 1 2 Miles

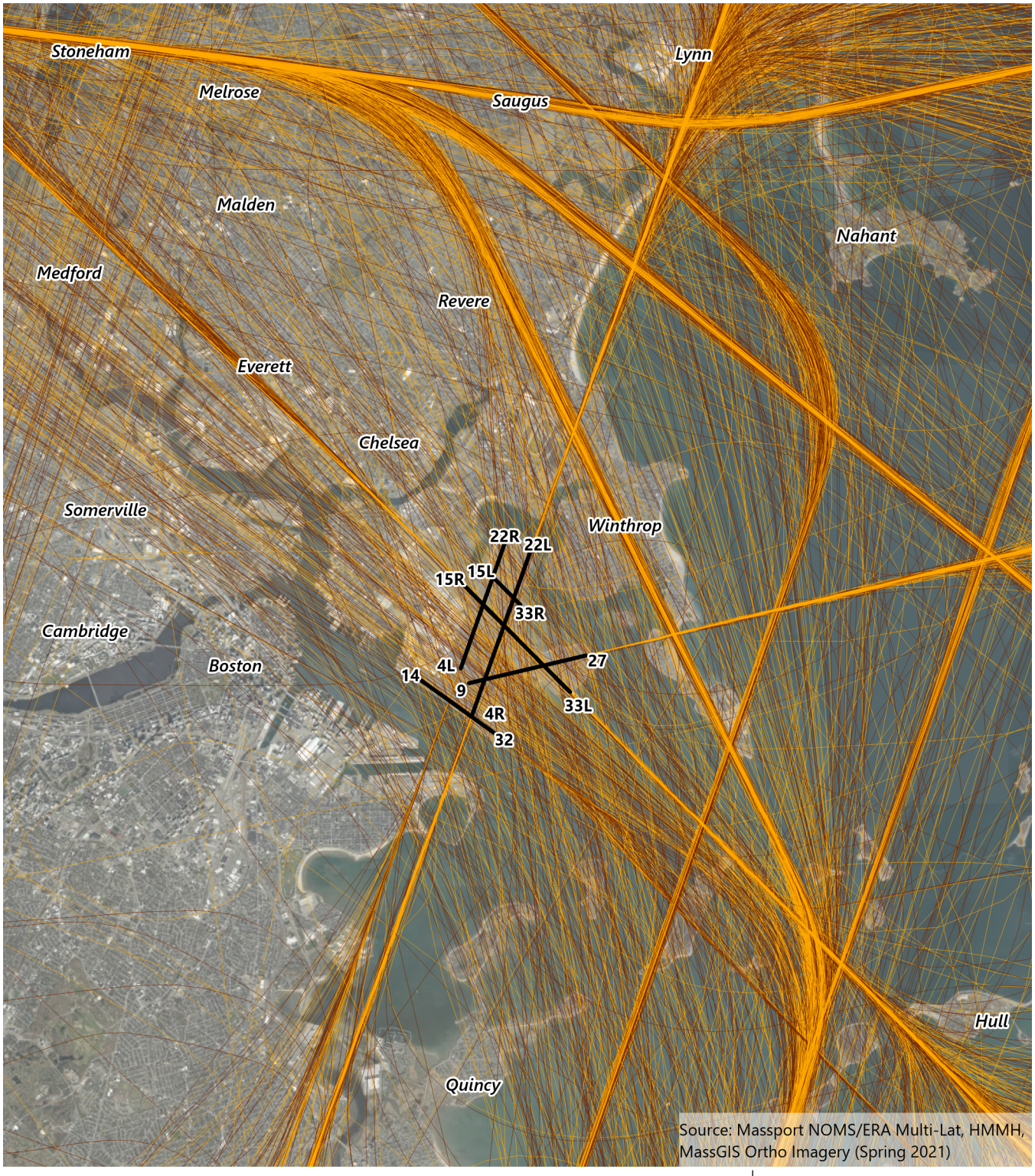


Figure 6-5 Air Carrier Arrival Flight Tracks

2020/2021 Environmental Data Report

2020 Air Carrier Jet Arrivals

2021 Air Carrier Jet Arrivals

0 1 2 Miles

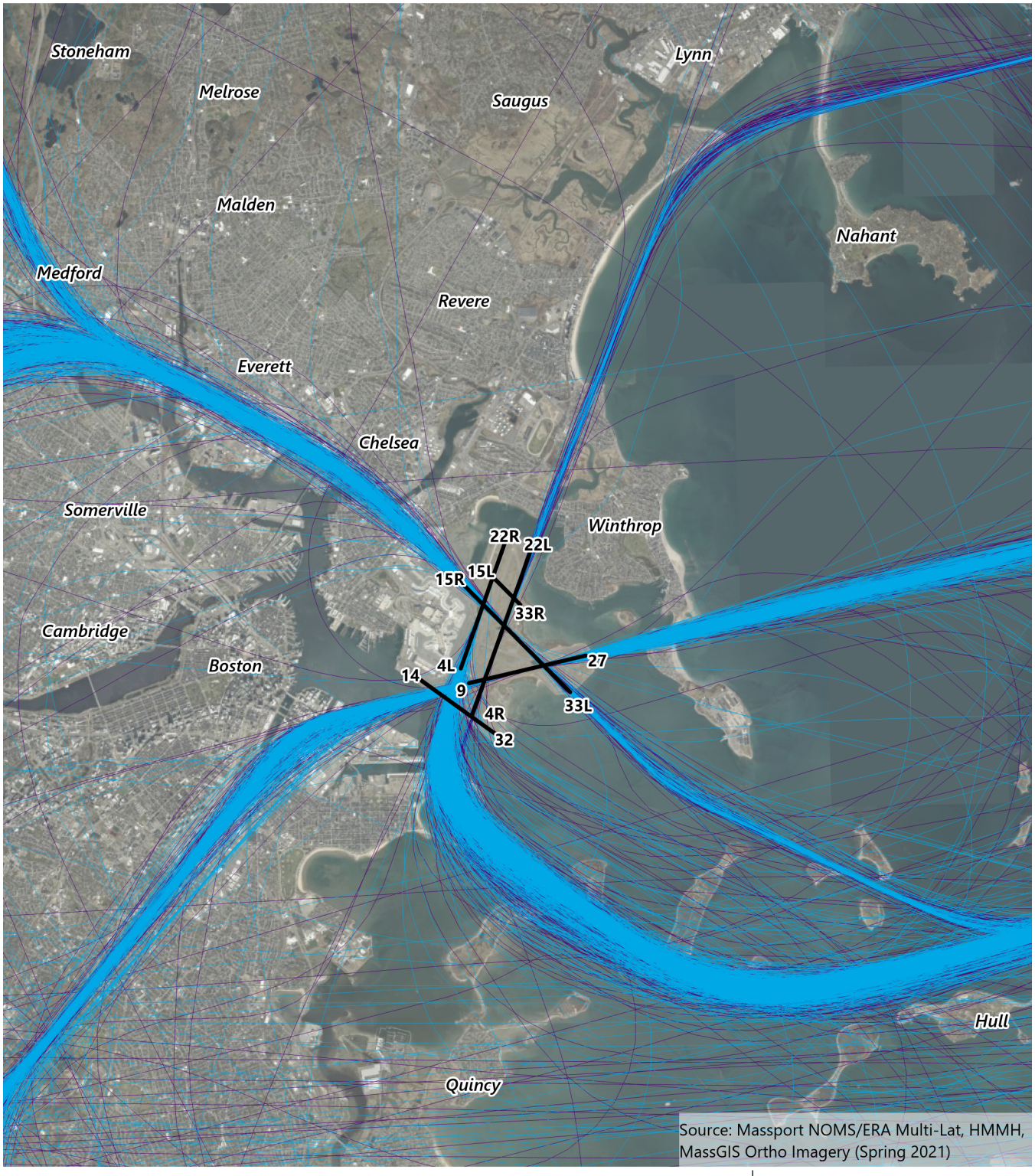


Figure 6-6 Regional Jet Departure Flight Tracks

2020/2021 Environmental Data Report

2020 Regional Jet Departures

2021 Regional Jet Departures

0 1 2 Miles

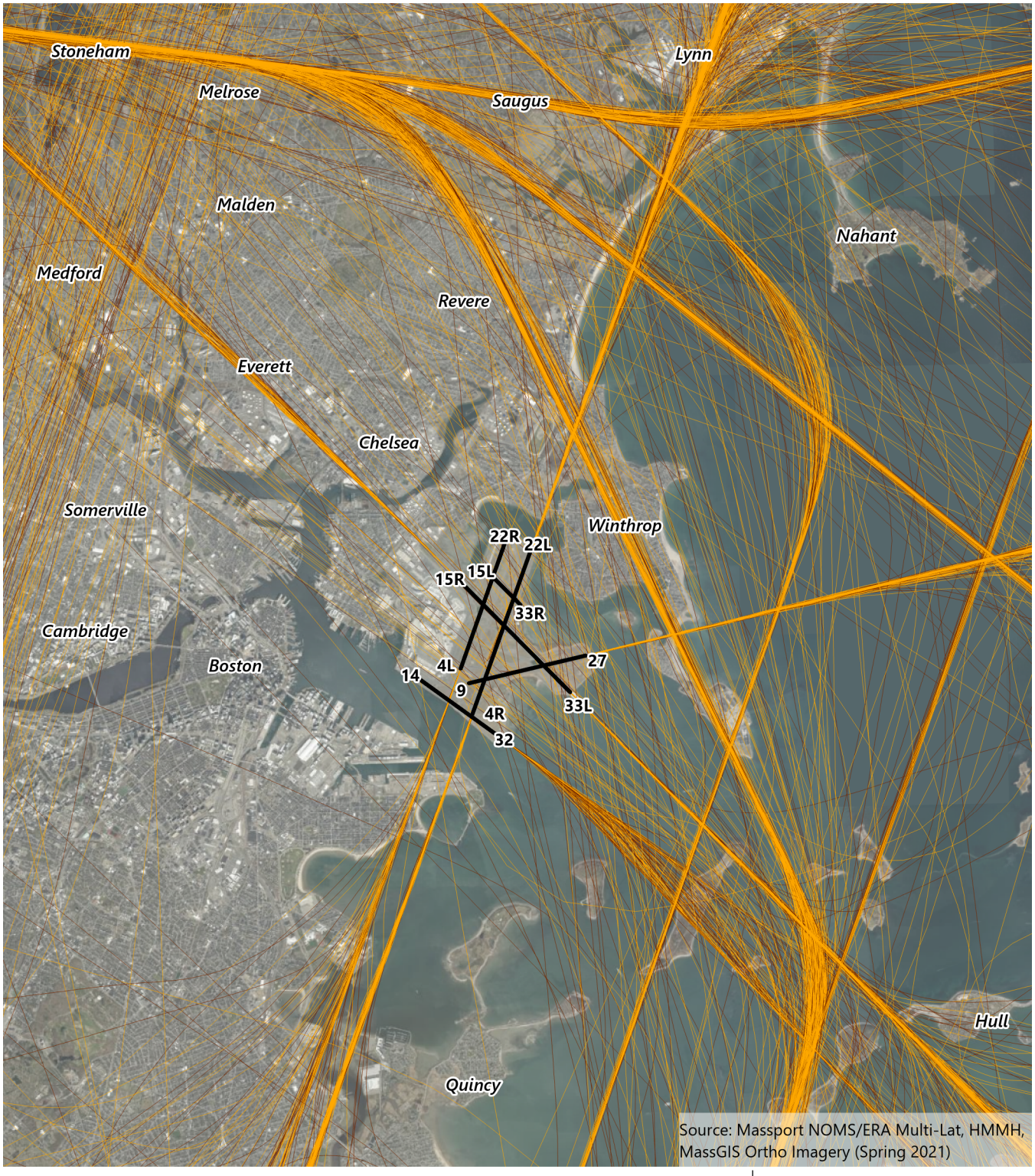


Figure 6-7 Regional Jet Arrival Flight Tracks

2020/2021 Environmental Data Report

2020 Regional Jet Arrivals

2021 Regional Jet Arrivals

0 1 2 Miles

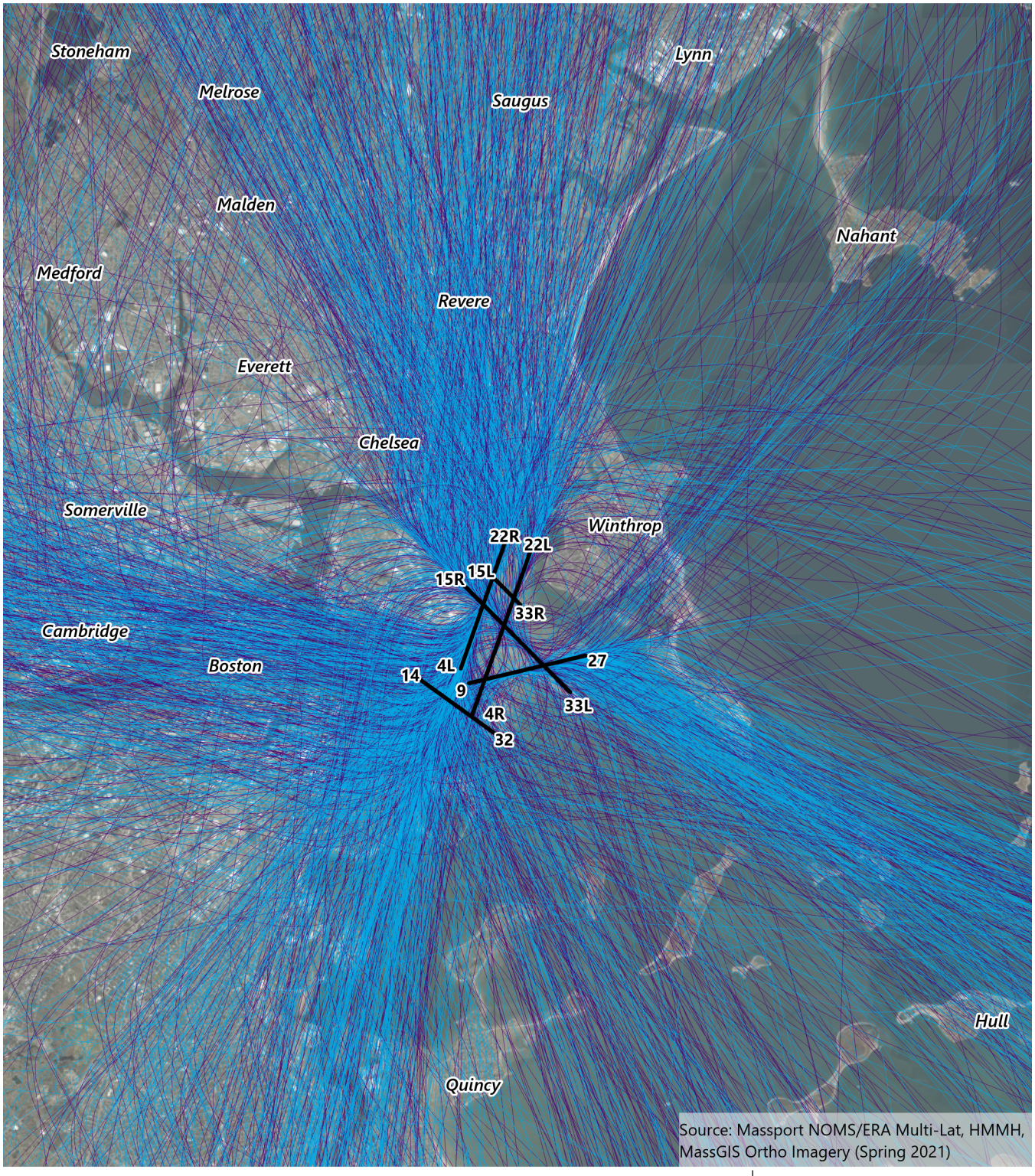


Figure 6-8 Non-Jet Departure Flight Tracks

2020/2021 Environmental Data Report

2020 Non-Jet Departures

2021 Non-Jet Departures

0 1 2 Miles

Note: Non-jet tracks are non-RNAV.

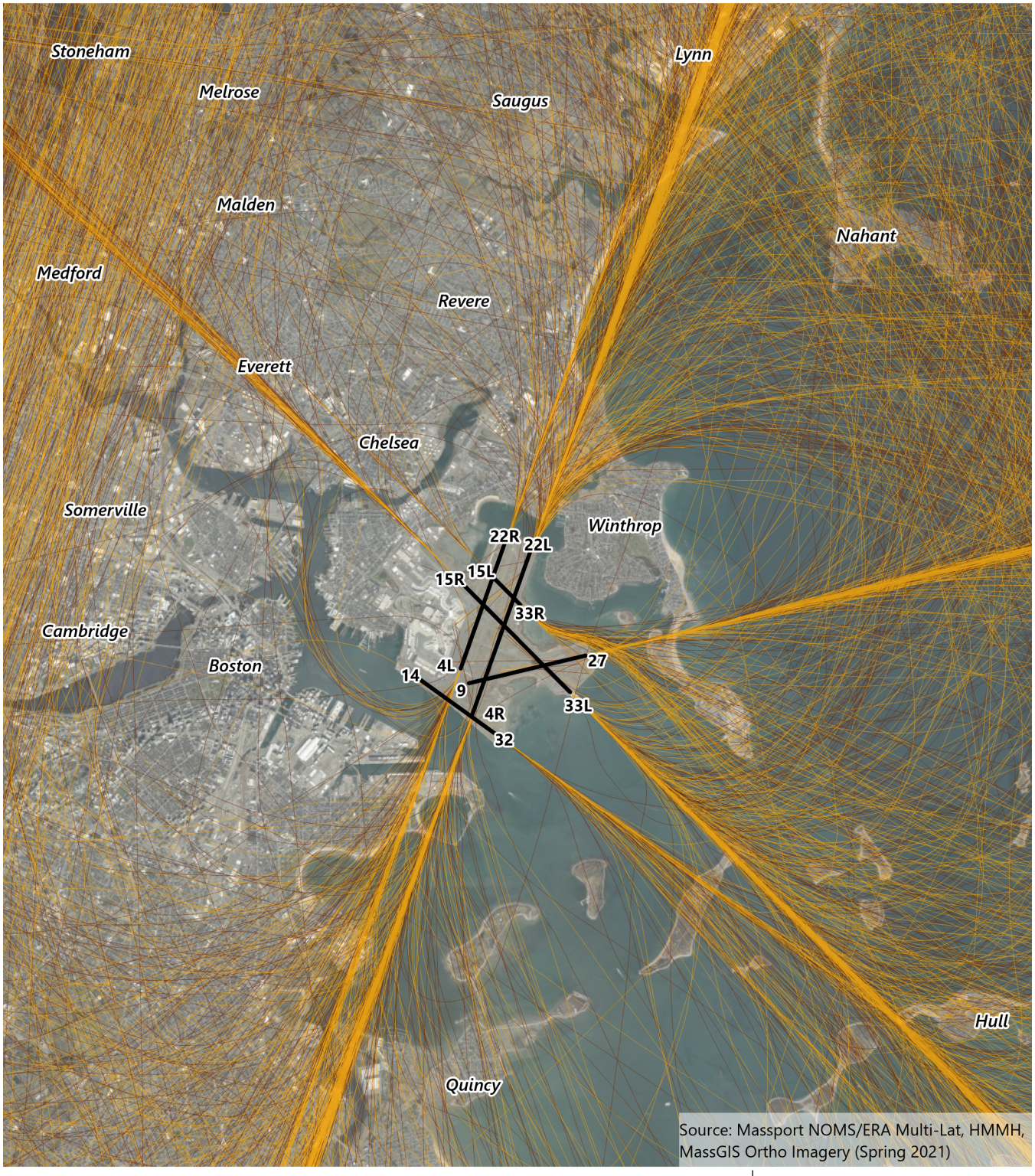


Figure 6-9 Non-Jet Arrival Flight Tracks

2020/2021 Environmental Data Report

2020 Non-Jet Arrivals

2021 Non-Jet Arrivals

0 1 2 Miles

Note: Non-jet tracks are non-RNAV.

Figure 6-10 Runway 33L Night (10PM - 7AM) Light Visual Approach Arrival Flight Tracks

2020/2021 Environmental Data Report

2020 Light Visual Approach Arrivals

2021 Light Visual Approach Arrivals

0 1 2 Miles

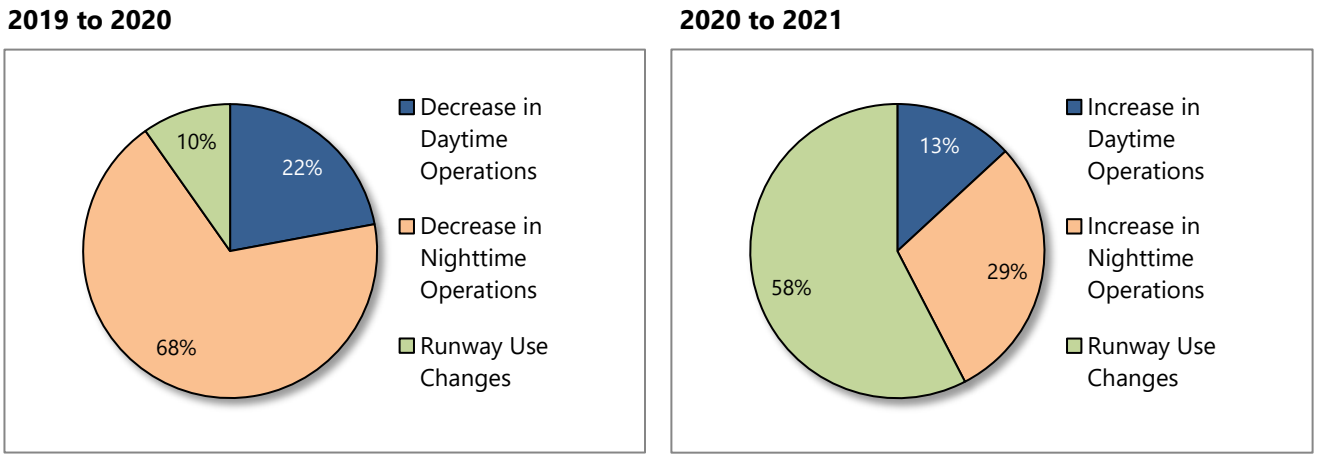
Noise Levels in 2020 and 2021

The following section describes the results of noise modeling in AEDT for 2020 and 2021. The DNL contours are presented graphically, the population living within contour intervals are tabulated, and DNL values computed by the model for the specific noise monitor locations are compared to the measured noise levels. Historical data are also provided for context. DNL 65 dB is the focus of much of the noise analysis, as it is the threshold for noise incompatibility with residential land use,[25,26] for both FAA and the U.S. Department of Housing and Urban Development.

Day-Night Noise Contours for 2020 and 2021

Compared to 2019, aircraft operations at Logan Airport in 2020 and 2021 were drastically reduced due to the global pandemic. Some differences in overall proportion of fleet mix, nighttime operations, and runway use also occurred. **Figure 6-11** shows the relative influence of these factors on changes in the noise contour.

Figure 6-11 Reason for Changes in Number of People Exposed to Day-Night Average Sound Level (DNL) Values Greater than or Equal to 65 dB (2019 to 2020 and 2020 to 2021)



Source: HMMH, 2022.

Figure 6-12 shows the DNL 65 dB contours for 2020 and 2021, superimposed with the previously published DNL 65 dB contour for 2019, calculated with the AEDT software.[27] The general shape of the 2020 contours is similar to the 2019 contours, but the 2020 contour is significantly smaller, due to the sharp decrease in operations that occurred in March 2020 and remained low through the remainder of the year.

25 14 Code of Federal Regulations Part 150, Appendix A to Part 150 Noise Exposure Maps, Sec. A150.101(d)).

26 24 Code of Federal Regulations Part 51, Subpart B Noise Abatement and Control, Sec. 51.103(c)).

27 2019 contours were calculated with AEDT version 3c; 2020 and 2021 contours were calculated with version 3d. The difference between AEDT versions 3c and 3d for noise calculations is minimal, as updates in this model version focus on air pollutant emission methodology rather than noise.

As noted in the discussion of **Tables 6-1** and **6-4**, average annual day operations for 2020 and 2021 were significantly less than 2019 resulting in the DNL 65 dB contour being smaller for both years all around the airport. Because the reduction in operations for 2020 is approximately 50 percent, the expected DNL decrease, if all else were held constant, would be about 3 dB. However, due to the Runway 9/27 construction closure in 2020, the reduction in DNL from 2019 to 2020 in some areas is closer to 2 dB; these areas correspond to increases in runway use percentages. In other areas, the reduction in DNL from 2019 to 2020 is almost 5 dB; these areas correspond to decreases in runway use. The 2021 contours reflect both a reduction in operations compared to 2019 and similar runway use as 2019, which results in a 2021 contour that is smaller than 2019 with about the same overall shape.

Specific changes in the DNL contours include:

- The contour lobe extending eastward over the Point Shirley area of Winthrop demonstrates a DNL decrease from 2019 to 2020 of close to 5 dB (rather than the expected 3 dB) as a result of the decreased percentage of Runway 27 arrivals and the decreased percentage of Runway 9 departures due to the 2.5-month runway construction closure in 2020. That trend is reversed from 2020 to 2021 due to both increased operations and full-year availability of Runway 9-27.
- The contour lobe extending northwest over the Eagle Hill section of East Boston, towards Chelsea, is different in shape for 2020 than for 2019. Percentage use of Runway 33L for departures increased moderately for 2020, but it is the increase in percentage use of Runway 15R for arrivals (from about 0.5 percent in 2019 to about 4 percent in 2020) that resulted in the observable shape change. From 2020 to 2021, in addition to the partial rebound in annual operations, the effective usage of Runway 33L for departures increased, both contributing to the 2021 contour falling between the 2019 and 2020 contours in that area. It should be noted that the effective use of Runway 15R for departures (pointed away from East Boston) affects East Boston with increased start-of-takeoff-roll noise that is observable as contour "shoulders" on either side of the extended runway centerline.
- The lobe of the contours that reaches north of the Airport into Revere shows a decrease from 2019 to 2020 due to decreased operations, but only a small increase from 2020 to 2021. There, the increases in operations from 2020 to 2021 are counteracted by decreases in arrival usage of Runway 22L and decreases in departure usage of Runway 4R.
- The contour lobe to the southeast over the water along the Runway 15R-33L extended centerline is smaller in 2020 than 2019 due to the decreased operations. The lengthening of that lobe from 2020 to 2021 is attributable to increased operations, increased effective usage of Runway 15R for departures, and increased use of Runway 33L for arrivals.

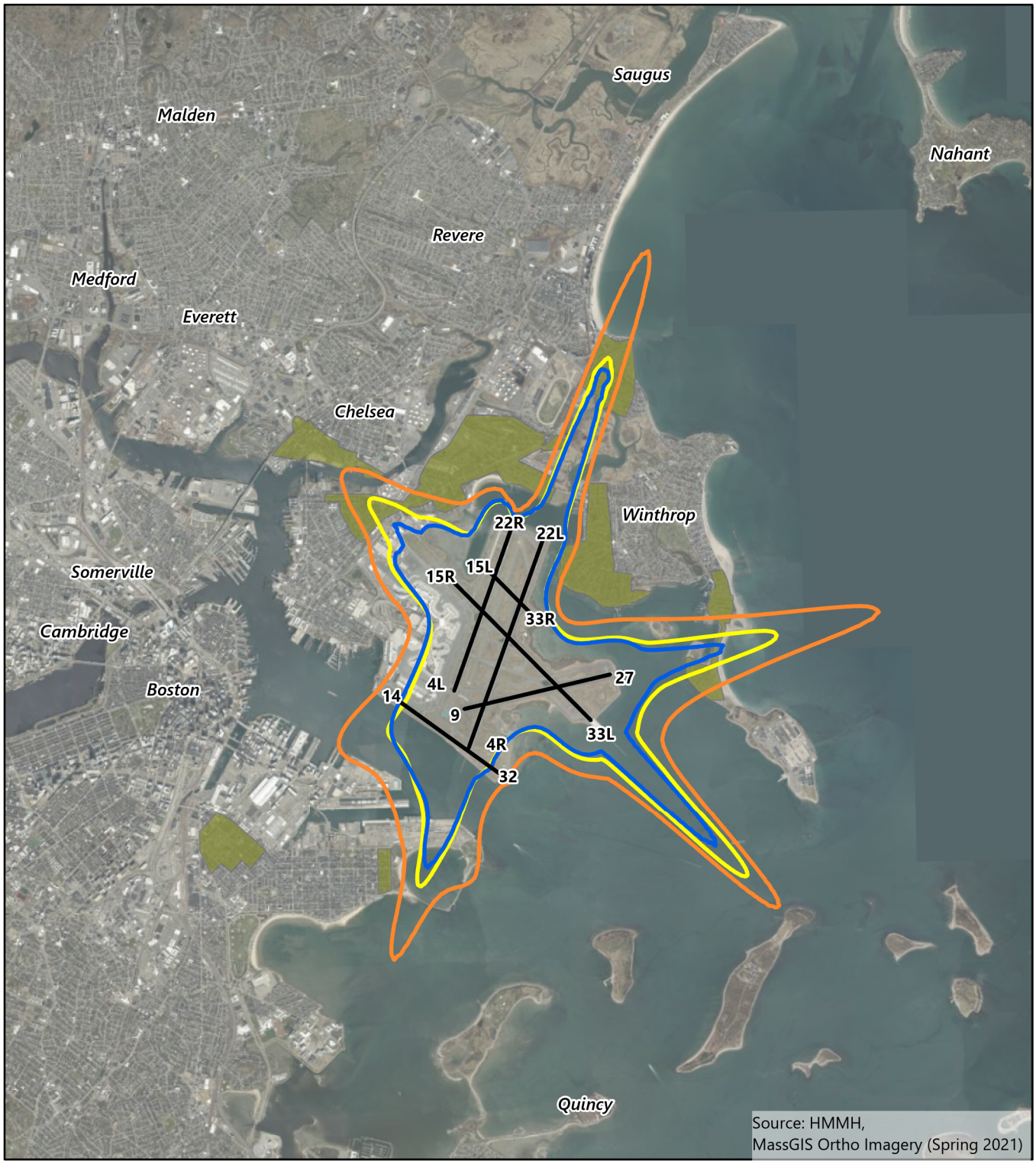


Figure 6-12 Comparison between 2019, 2020, and 2021 DNL 65 dB Contours

2020/2021 Environmental Data Report

2019 DNL Contour (AEDT 3c)

2020 DNL Contour (AEDT 3d)

2021 DNL Contour (AEDT 3d)

Sound Insulation Areas

0 4,000 8,000 Feet

Figure 6-13 displays the DNL contour set (DNL 60, 65-, 70-, and 75-dB contours) for 2020 and **Figure 6-14** displays the DNL contour set for 2021.

There is a demonstrated long-term trend of noise level reduction at Logan Airport due to efforts by Massport, airlines, and the FAA, as well as improvements in engine technologies. The nationwide phaseout of Stage 2 operations in 1999 and today's requirements that newly certificated aircraft meet Stage 5 noise levels are two indicators of the continual technological improvements. **Figure 6-15** presents the DNL 65 dB noise contours from 1990, 2019, 2020, and 2021. The 2020 and 2021 contours are understood to be abnormally small due to the effects of the pandemic on air travel; as such, the 2019 contours are more representative of a baseline.

Population Impact Assessment

Massport reports population counts within selected 5 dB increments of exposure each year to indicate how Logan Airport's noise environment changes over time. **Table 6-7** shows population counts for 2020 and 2021 by noise level and by community, compared to previous years. The 2020 U.S. Census data forms the basis of the population counts for 2020 and 2021. Population counts from 2000 through 2009 are based on U.S. Census data for 2000, while the counts for 2010 through 2019 were prepared using 2010 U.S. Census data.

The population-counting process determines the fraction of the area of the U.S. Census block that is within the contour and multiplies the block population by this fraction to determine the population exposed to DNL 65 dB or greater for that block. **Table 6-7** provides population results for the contour set for each given year, with the model noted.

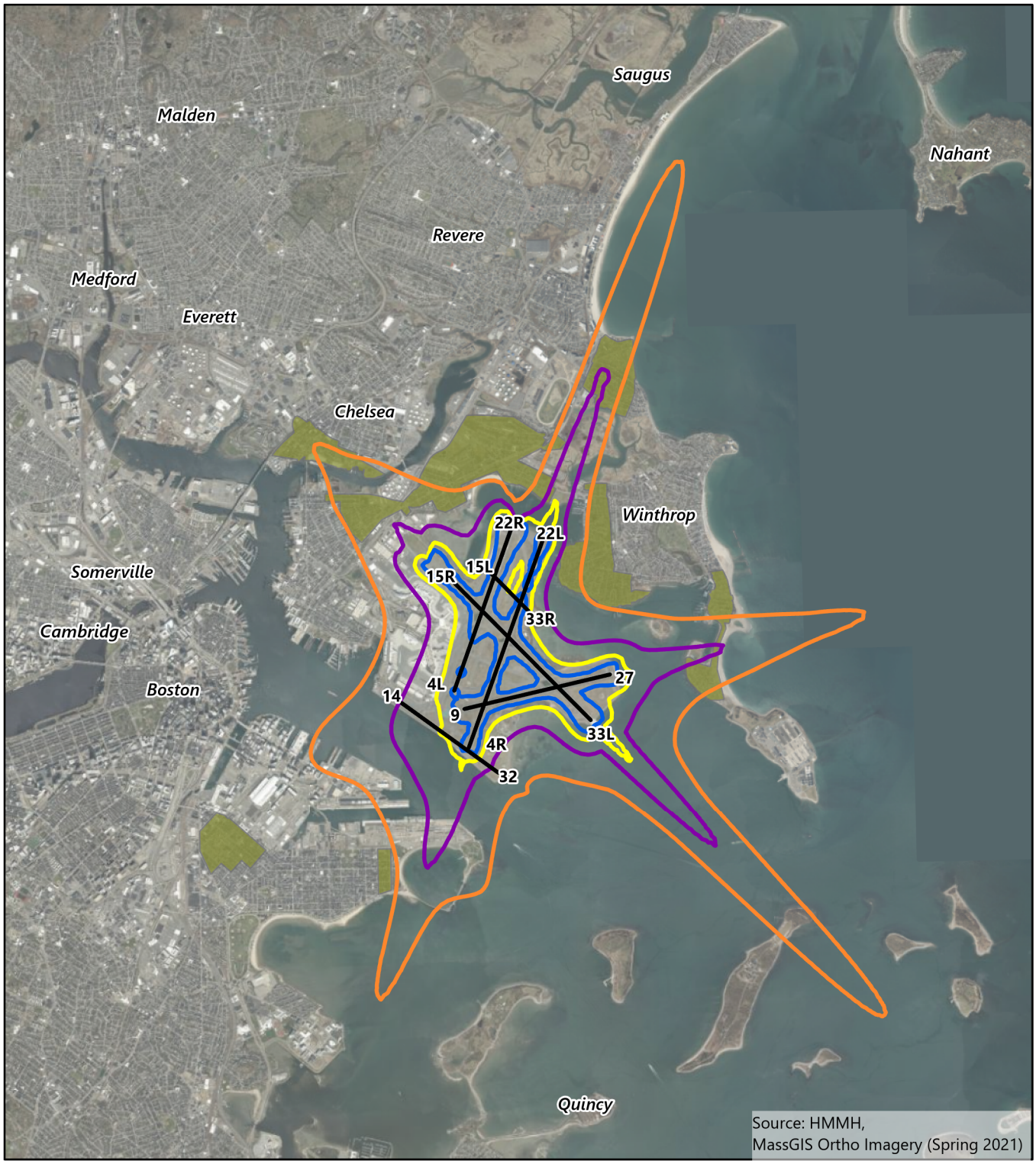


Figure 6-13 60-75 DNL Contours for 2020 Operations Using AEDT 3d

2020/2021 Environmental Data Report

2020 DNL Contour (AEDT 3d)

- 60
- 65
- 70
- 75

Sound Insulation Areas

0 4,000 8,000 Feet

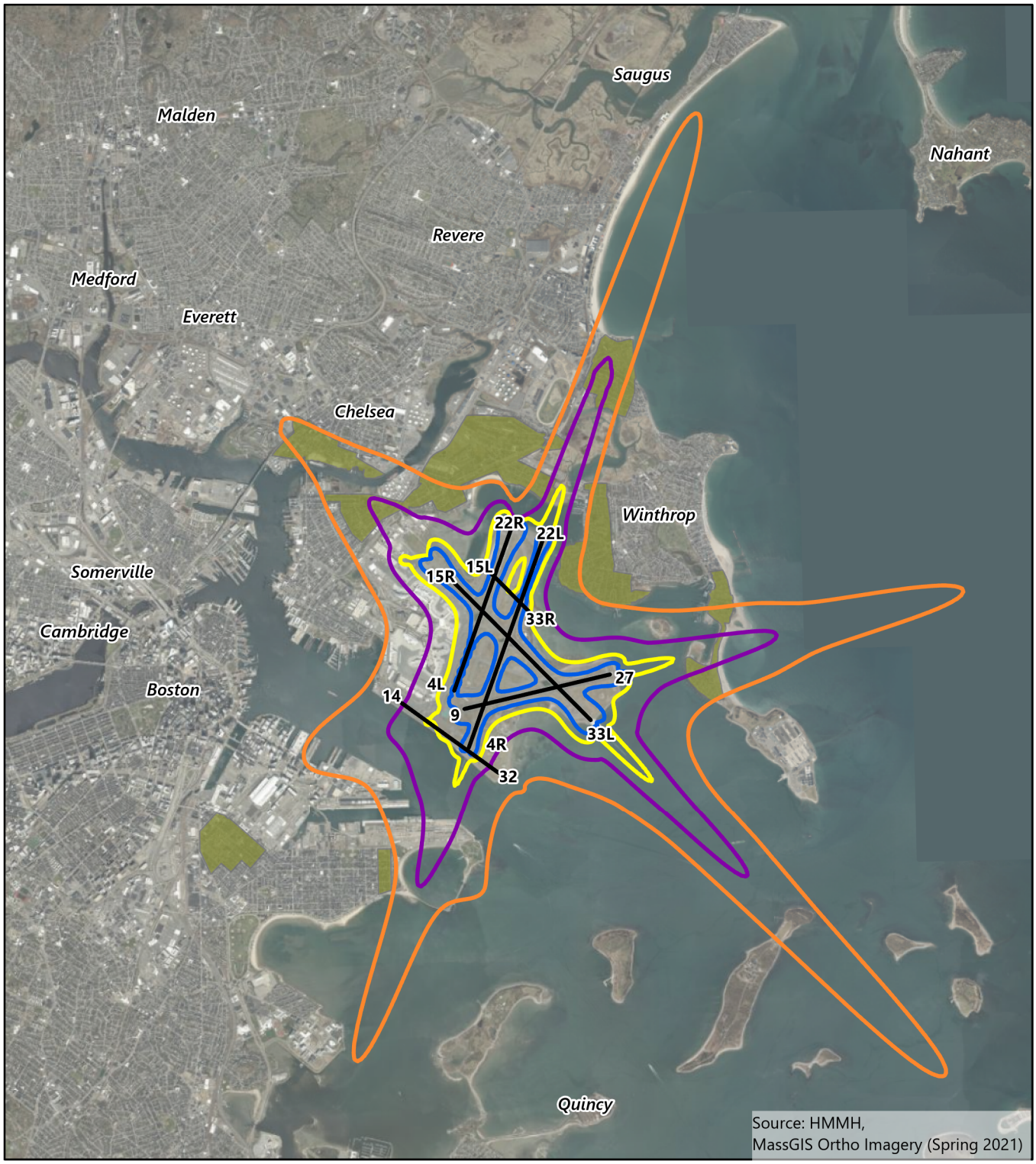


Figure 6-14 60-75 DNL Contours for 2021 Operations Using AEDT 3d

2020/2021 Environmental Data Report

2021 DNL Contour (AEDT 3d)

- 60
- 65
- 70
- 75

Sound Insulation Areas

0 4,000 8,000 Feet

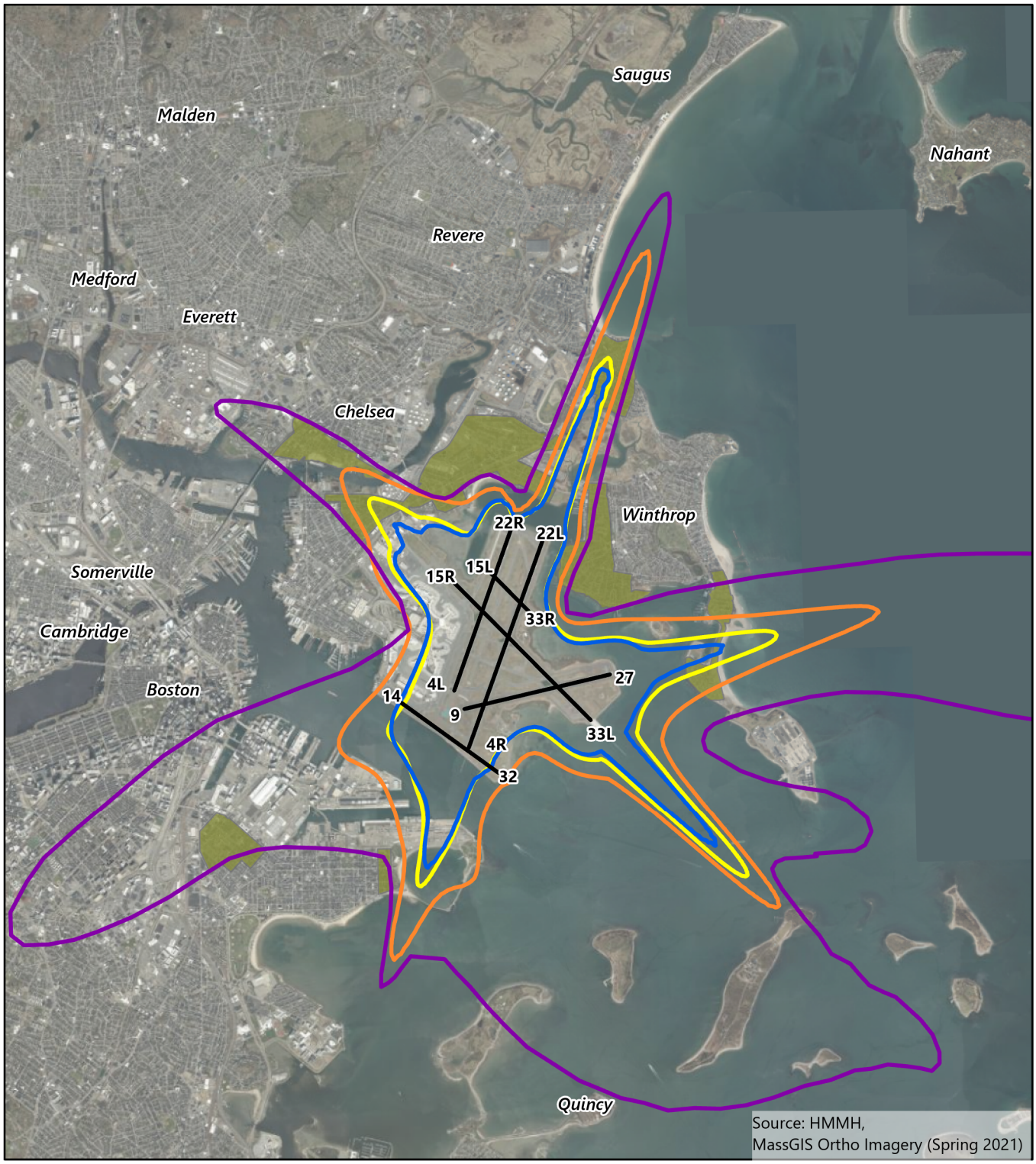


Figure 6-15 Comparison between 1990, 2019, 2020, and 2021 DNL 65 dB Contours

2020/2021 Environmental Data Report

2019 DNL Contour (AEDT 3c)

2020 DNL Contour (AEDT 3d)

2021 DNL Contour (AEDT 3d)

1990 DNL Contour (INM)

Sound Insulation Areas

0 4,000 8,000 Feet

Table 6-7 Population Exposed to DNL 65 dB or Greater, by Community[1]

Year	> 75 DNL	70-75 DNL	65[3]-70 DNL	Total (65+)[3] DNL	Year	> 75 DNL	70-75 DNL	65[3]-70 DNL	Total (65+)[3] DNL
Boston					**Revere**				
1990	0	1,778	28,970	30,748	1990	0	0	4,274	4,274
2000	0	234	9,014[2]	9,248[2]	2000	0	0	2,496	2,496
2010	0	0	689[2]	689[2]	2010	0	0	2,413	2,413
2015	0	110	7,255[2]	7,365[2]	2015	0	0	3,789	3,789
2016	0	0	4,031	4,031	2016	0	0	2,376	2,376
2017	0	14	4,720	4,734	2017	0	0	2,362	2,362
2018	0	11	2,228	2,239	2018	0	0	3,574	3,574
2019	0	7	4,029	4,036	2019	0	0	3,484	3,484
2020	0	0	60	60	2020	0	0	641	641
2021	0	0	885	885	2021	0	0	1,260	1,260
Chelsea					**Winthrop**				
1990	0	0	4,813	4,813	1990	676	1,211	2,420	4,307
2000	0	0	0	0	2000	247	1,070	4,684	6,001
2010	0	0	0	0	2010	0	130	598	728
2015	0	0	0	0	2015	0	320	2,623	2,943
2016	0	0	0	0	2016	0	130	913	1,043
2017	0	0	65	65	2017	0	125	647	772
2018	0	0	0	0	2018	0	51	1,170	1,221
2019	0	0	0	0	2019	0	96	1,152	1,248
2020	0	0	0	0	2020	0	0	103	103
2021	0	0	0	0	2021	0	0	352	352
Everett					**All Communities**				
1990	0	0	0	0	1990	676	2,989	40,477	44,142
2000	0	0	0	0	2000	247	1,304	16,194	17,745
2010	0	0	0	0	2010	0	130	3,700	3,830
2015	0	0	0	0	2015	0	430	13,667	14,097
2016	0	0	0	0	2016	0	130	7,320	7,450
2017	0	0	0	0	2017	0	139	7,794	7,933
2018	0	0	0	0	2018	0	62	6,972	7,034
2019	0	0	0	0	2019	0	103	8,665	8,768
2020	0	0	0	0	2020	0	0	804	804
2021	0	0	0	0	2021	0	0	2,497	2,497

Source: Massport and HMMH, 2022.

Notes: Population counts for 2020 and later used the 2020 Census data; counts from 2010 to 2019 used 2010 U.S. Census data; counts for 2000 used the 2000 U.S. Census data; counts for 1990 used the 1980 U.S. Census data.

1 The then-current version of the FAA's noise model was used for each analysis: contours for 2016 through 2021 used versions of AEDT; 2015 and prior years used versions of INM. Specific model versions and data for years not shown here are available in Appendix H, *Noise Abatement*.

2 These values reflect the effect of the FAA-approved terrain adjustment in Orient Heights.

3 Day-Night Average Sound Level (DNL) 65 decibel (dB) is the federally defined noise criterion used as a guideline to identify when residential land use is considered incompatible with aircraft noise.

On the preceding pages, the discussions of the comparisons of consecutive years' DNL 65 dB contours (as shown in **Figure 6-12**) detail the contour changes over the populated areas exposed to DNL 65 dB or greater. The population changes seen in **Table 6-7** reflect those contour changes.

The estimated population within the DNL 65 dB contour decreased dramatically from 2019 and previous years to 2020, due to the lower noise levels resulting from the unprecedented reduction in aircraft operations. As expected from the partial resurgence of aircraft operations, and from the DNL contours shown in **Figures 6-12** through **6-15**, the 2021 DNL 65 contour reaches further into populated areas of Boston, Winthrop, and Revere than does the 2020 DNL 65 contour, but remains smaller than the 2019 DNL 65 contour. The 2020 and 2021 DNL 70 contours do not encompass any populated land area.

Noise Measurement Data

Massport's permanent noise monitoring system consists of 30 noise monitors located around the Airport and environs, as shown in **Figure 6-16**. During normal operation, the noise monitors continuously measure noise exposure levels as well as a variety of metrics associated with individual noise events that exceed preset threshold sound levels. Noise monitoring data are transmitted back to Massport's Noise Office, where daily DNL values and other noise metrics are computed for each location and are summarized in various reports. It should be noted that noise monitors collect sound data from not only aircraft noise events, but surrounding noise events such as roadway traffic and construction. Software algorithms identify aircraft noise events which allows Massport to separately calculate total DNL and aircraft only DNL. In 2020, community noise levels near the monitors would have decreased from their typical norms due to the pandemic. For some monitors, decreased ambient noise levels may have helped the system identify aircraft noise events, resulting in slightly higher calculations of aircraft only DNL.

Table 6-8 compares the measured 2019, 2020, and 2021 aircraft noise DNL values at each location. The average measured aircraft DNL at the monitoring locations was 56.5 dB in 2019, 52.4 dB in 2020, and 55.1 dB in 2021. This represents a decrease of 4.1 dB from 2019 to 2020, and an increase of 2.7 dB from 2020 to 2021. The average measured aircraft DNL for 2021 (55.1 dB) was 1.4 dB less than 2019 (56.5 dB).

For 2020, all locations except sites 21 and 25 had measured decreases of about 3 dB or more as compared to the 2019 value, as would be expected from the decrease of over 50 percent in operations. The two exceptions (sites 21 and 25) are over 4 miles from the Airport; differences may be due to better identification of aircraft noise events due to pandemic-related reduced ambient noise levels.

For 2021, the average decrease in measured aircraft only DNL as compared to 2019 was close to 2 dB, which is consistent with the 38 percent fewer flights. Four sites show results that were higher in 2021 than 2019; these are site 5 (in Winthrop), site 21 (in Everett), site 28 (in Dorchester), and site 29 (in Mattapan), the last three of which are over 4 miles from the Airport. At site 5 in Winthrop, the measured aircraft only DNL for 2021 is almost 3 dB higher than for 2019. Inspection of the data for that site indicates likely calibration issues for 2020 that may have started in 2019 and were rectified when the monitor was replaced in June 2020.

FIGURE 6-16 Noise Monitor Locations

2020/2021 Environmental Data Report

● Permanent Noise Monitor

▲ Airport Reference Point

0 2000 4000 8000 Feet

All sites have been verified by survey.
Locations not shown on map:
#19 Smith Lane, Swampscott
#20 Pond and Town Court, Lynn

Table 6-8 Comparison of Measured Aircraft Noise Levels (DNL) From 2019 to 2021

		Distance from Airport (miles)	Measured Aircraft Noise Level (DNL)			Difference	
Site	**Location**		**2019**	**2020**	**2021**	**2020-2019**	**2021-2019**
1	South End – Andrews Street	3.7	N/A	N/A	N/A	N/A	N/A
2	South Boston – B and Bolton	2.9	58.6	53.9*	56.3	(4.7)	(2.3)
3	South Boston – Day Blvd. near Farragut	2.5	63.1*	57.6	58.8	(5.5)	(4.3)
4	Winthrop – Bayview and Grandview	1.6	72.5*	66.6	69.7	(5.9)	(2.8)
5	Winthrop – Harborview and Faun Bar	1.9	59.2	N/A	62.0	N/A	2.8
6	Winthrop – Somerset near Johnson	0.8	64.6	60.1	62.7	(4.5)	(1.9)
7	Winthrop – Loring Road near Court	1.0	N/A	59.8*	63.4	N/A	N/A
8	Winthrop – Morton and Amelia	1.6	60.6	56.3	58.3	(4.3)	(2.3)
9	East Boston – Bayswater near Annavoy	1.3	68.6	64.4	66.5	(4.2)	(2.1)
10	East Boston – Bayswater near Shawsheen	1.3	63.0	58.5	60.6	(4.5)	(2.4)
11	East Boston – Selma and Orient	1.8	60.2*	52.3	57.1	(7.9)	(3.1)
12	Coleridge Street, East Boston	1.2	64.2*	60.0	62.5	(4.2)	(1.7)
13	East Boston High School	1.9	62.9	59.0	61.0	(3.9)	(1.9)
14	East Boston – Jeffries Point Yacht Club	1.2	57.8*	53.3	55.4	(4.5)	(2.4)
15	Chelsea – Admiral's Hill	2.8	61.9*	58.0	60.1	(3.9)	(1.8)
16	Revere – Bradstreet and Sales	2.4	70.4	66.3*	68.2	(4.1)	(2.2)
17	Revere – Carey Circle	5.3	61.3	58.5*	59.9	(2.8)	(1.4)
18	Nahant – U.S.C.G. Recreational Facility	5.9	38.4	33.7	37.5	(4.7)	(0.9)
19	Swampscott – Smith Lane	8.7	40.8	37.2	40.2	(3.6)	(0.6)
20	Lynn – Pond and Towns Court	8.4	54.4	50.3	52.3	(4.1)	(2.1)
21	Everett – Tremont near Prescott	4.5	51.2	51.0	52.4	(0.2)	1.2
22	Medford – Magoun near Thatcher	6.0	54.2	49.1	51.4	(5.1)	(2.8)
23	Dorchester – Myrtlebank near Hilltop	6.3	56.3	48.1*	49.1	(8.2)	(7.2)
24	Milton – Cunningham Park near Fullers	8.1	49.4	44.3	47.5	(5.1)	(1.9)
25	Quincy – Squaw Rock Park	4.2	38.9	43.4	37.8	4.5	(1.1)
26	Hull – Hull High School near Channel St.	6.0	59.7	56.0*	58.4*	(3.7)	(1.3)
27	Roxbury – Boston Latin Academy	5.3	54.6	48.7	52.1	(5.9)	(2.5)
28	Jamaica Plain – Southbourne Road	7.7	46.4	40.7	47.2	(5.7)	0.8
29	Mattapan – Lewenburg School	7.3	37.4	33.9	39.9	(3.5)	2.5
30	East Boston – Piers Park	1.5	50.4	45.4	49.5	(5.0)	(0.9)
		Arithmetic Average	**56.5**	**52.4**	**55.1**	**(4.3)**	**(1.7)**

Source: HMMH, 2022.

Notes: DNL - Day-Night Average Sound Level; N/A – not available.
Changes in ( ) represent a decrease in measured noise level.
Distance from Logan Airport calculated from the Airport Reference Point, which is located along Runway 4L-22R near its intersection with Runway 15R-33L. This location is shown in **Figure 6-16**.
* Indicates sites with more than 20 days missing from yearly average DNL.
The monitor at Site 1 was removed in May 2017; Massport, in collaboration with the South End community, has identified a site to relocate Site 1 and expects it will be operational sometime in late 2022. Site 5 had equipment calibration issues in early 2020. Site 7 was not operational in 2019; it was restored in July 2020. Sites 1, 5 and 7 (shaded cells) are therefore not included in the average values.

Comparing Measured and Modeled Noise Levels

On an annual basis, Massport reports a comparison of measured noise levels to the computer model results for the specific monitor locations. Differences between measured and modeled values have narrowed over the years as both the noise monitoring and modeling processes have been refined. As shown in **Table 6-9**, for 2020, the difference between the average measured and modeled DNL was 3.1 dB; in 2021, the difference was 1.0 dB. The 2019 difference between the average measured and modeled DNL was 2.3 dB. Because the modeled values are generally larger (i.e., higher sound levels) than the measured values, especially at the more distant monitors, the average difference is usually a positive value.

As shown in **Table 6-9**, the agreement between measured and modeled DNL is within 1 dB at nine of the sites in 2020 and 15 sites in 2021. At the other locations for 2020, the measured value is less than the model result. At the other locations for 2021, the measured value is 1 to 3 dB higher than the model result at four sites: Sites 6, 11, 16, and 27. When the majority of the measured noise values are less than the model results, as is the case for the last several years, that indicates that the contours tend to be conservative estimates of the noise. It is not unusual to experience larger differences between measured and modeled levels at the locations with measured DNL below 60 dB. At those locations, the monitor identification of aircraft noise events becomes more difficult to differentiate from other noise sources, and long-distance noise attenuation effects can reduce actual levels that the model cannot duplicate. Larger differences at these sites, which tend to be farther from the Airport, increase the average overall difference between measured and modeled results.

Table 6-9 Comparison of Measured Aircraft DNL Values to AEDT Modeled DNL Values

Site[1]	Distance from Airport (miles)[2]	2019		2020		2021		Difference: Modeled minus Measured		
		Measured Aircraft – Only DNL	Modeled (AEDT) DNL	Measured Aircraft – Only DNL	Modeled (AEDT) DNL	Measured Aircraft – Only DNL	Modeled (AEDT) DNL	2019	2020	2021
1[3]	3.7	N/A	56.4	N/A	52.2	N/A	52.2	N/A	N/A	N/A
2	2.9	58.6	59.7	53.9*	55.2	56.3	55.5	1.1	1.3	(0.8)
3	2.5	63.1*	61.8	57.6	57.7	58.8	58.0	(1.3)	0.1	(0.8)
4	1.6	72.5*	71.8	66.6	66.6	69.7	69.0	(0.7)	0.0	(0.7)
5	1.9	59.2	64.9	N/A	59.9	62.0	61.7	5.7	N/A	(0.3)
6	0.8	64.6	62.4	60.1	59.9	62.7	60.0	(2.2)	(0.3)	(2.7)
7[3]	1.0	N/A	67.3	59.8*	63.6	63.4	63.5	N/A	3.8	0.1
8	1.6	60.6	62.1	56.3	58.7	58.3	59.0	1.5	2.4	0.7
9	1.3	68.6	68.8	64.4	65.3	66.5	65.9	0.2	0.9	(0.6)
10	1.3	63.0	62.8	58.5	59.4	60.6	59.7	(0.2)	0.9	(0.9)
11	1.8	60.2*	57.6	52.3	54.4	57.1	54.6	(2.6)	2.1	(2.5)
12	1.2	64.2*	66.0	60.0	62.0	62.5	62.6	1.8	2.0	0.1
13	1.9	62.9	63.9	59.0	60.4	61.0	61.5	1.0	1.4	0.5
14	1.2	57.8*	61.8	53.3	58.9	55.4	58.6	4.0	5.6	3.2
15	2.8	61.9*	61.6	58.0	57.6	60.1	59.1	(0.4)	(0.4)	(1.0)
16	2.4	70.4	69.2	66.3*	65.9	68.2	66.7	(1.2)	(0.4)	(1.6)
17	5.3	61.3	61.8	58.5*	58.3	59.9	59.1	0.5	(0.2)	(0.8)
18	5.9	38.4	45.9	33.7	43.3	37.5	43.1	7.5	9.6	5.6
19	8.7	40.8	45.5	37.2	42.7	40.2	43.0	4.7	5.5	2.8
20	8.4	54.4	56.4	50.3	52.9	52.3	53.5	2.0	2.6	1.2
21	4.5	51.2	55.0	51.0	53.2	52.4	53.5	3.8	2.2	1.1
22	6.0	54.2	54.6	49.1	50.4	51.4	51.5	0.4	1.3	0.1
23	6.3	56.3	55.9	48.1*	51.7	49.1	53.0	(0.4)	3.6	3.9
24	8.1	49.4	54.0	44.3	50.0	47.5	51.3	4.6	5.7	3.8
25	4.2	38.9	50.5	43.4	47.2	37.8	46.8	11.6	3.8	9.0
26	6.0	59.7	59.7	56.0*	56.9	58.4*	57.9	0.0	0.9	(0.5)
27	5.3	54.6	54.8	48.7	50.3	52.1	50.7	0.2	1.6	(1.4)
28	7.7	46.4	51.6	40.7	47.1	47.2	47.4	5.2	6.4	0.2
29	7.3	37.4	48.6	33.9	44.5	39.9	44.5	11.2	10.6	4.6
30	1.5	50.4	59.0	45.4	55.9	49.5	55.7	8.6	10.5	6.2
Arithmetic Average		**56.5**	**58.8**	**52.4**	**55.5**	**55.1**	**56.1**	**2.4**	**3.1**	**1.0**

Source: HMMH, 2022.

Notes: DNL – Day-Night Average Sound Level. Modeled results were computed for the whole year. N/A – not available.
* Indicates sites with more than 20 days missing from measured yearly average DNL.

1 Site numbers correlate with the **Figure 6-16** map and the addresses listed in Table 6-8.

2 Distance from Logan Airport calculated from the Airport Reference Point, which is located along Runway 4L-22R near its intersection with Runway 15R-33L. This location is shown in **Figure 6-16**.

3 Site 1 not in operation since 2017, Site 5 equipment calibration issues in early 2020, and Site 7 restored to operation in July 2020.

Supplemental Metrics

To further describe the noise environment, this *2020/2021 EDR* includes supplemental noise metrics: CNI, dwell and persistence, and times above a noise threshold.

Cumulative Noise Index (CNI)

Massport reports total annual fleet noise at Logan Airport, as defined in the Logan Airport Noise Rules by a metric referred to as CNI. CNI is a single number representing the sum of the entire set of single-event noise energy from each aircraft operation (takeoff or landing) at Logan Airport over a full year of operation. CNI is weighted similarly to DNL, meaning an extra 10 dB is added to each event occurring at night. This weighting is equivalent to multiplying the number of nighttime operations by each aircraft by a factor of 10.

The Logan Airport Noise Rules define CNI in units of EPNdB[28] and require that the index be computed for the fleet of commercial aircraft operating at Logan Airport throughout the year. In addition, in EDRs and Environmental Status and Planning Reports (ESPRs), Massport reports partial CNI values of noise at Logan Airport, so that contributions from various subsets of the fleet (cargo, night operations, passenger jets, etc.) are identified. Airline and aircraft registration information from the NOMS allows the proper noise certification levels to be selected from the latest aircraft noise registration database.[29]

The Noise Rules, adopted by Massport following public hearings held in February 1986, established a CNI limit of 156.5 EPNdB. As shown in the top lines of **Table 6-10**, the CNI generally has decreased since 1990, remaining below the cap, and typical changes from one year to the next have been within a few tenths of a decibel. Since its 2010 minimum of 151.9 EPNdB, the CNI had increased moderately through the past decade in response to increases in operations. In 2020, the CNI decreased by 3.2 dB from the 2019 value, in response to the pandemic-induced approximately 52 percent decrease in operations. In 2021, as operations partially rebounded, CNI increased by 1.2 dB to 151.5 EPNdB, yet remained 2.0 dB less than the 2019 value of 153.5 EPNdB.

Partial Cumulative Noise Index (CNI) Calculations

The analysis of partial CNI values helps to explain the yearly changes. Partial CNI values are obtained by summing the noise from particular segments of Logan Airport's total operations. They are useful for identifying the greatest contributors to overall noise. As shown in **Table 6-10**, the sectors of the fleet with the highest numbers of partial CNI indicate a greater contribution to total noise.

Year-to-year changes can be best understood by examining the subsets of jet operations in **Table 6-10**. Although total CNI dropped in proportion to the decrease in overall operations from 2019 to 2020, the partial CNI from cargo operations increased due to an increase in cargo operations. Most of the increase was in daytime cargo (as opposed to nighttime). The number of daytime cargo operations increased by about 22 percent from 2019 to 2020 and increased again from 2020 to 2021. There were 41 percent more daytime cargo

28 Effective Perceived Noise Level in decibels (EPNdB) is the noise metric used to certify aircraft under CFR Part 36.

29 Type-certificate data sheet for noise database available from the European Aviation Safety Agency; http://www.easa.europa.eu/document-library/noise-type-certificates-approved-noise-levels.

operations in 2021 than in 2019. At the same time, the number of nighttime cargo operations increased by about 3 percent from 2019 to 2020, but then decreased from 2020 to 2021. There were 1 percent fewer nighttime cargo operations in 2021 than in 2019.

Passenger operations dominate the cumulative noise because, even with the increase in cargo operations, passenger flights comprise about 96 percent of commercial jet operations. Nighttime passenger operations contribute more to CNI than daytime passenger operations do because of the tenfold weighting to nighttime noise events in the calculation.

Table 6-10 Cumulative Noise Index (CNI) (EPNdB)[1]

	Logan Airport CNI Cap – 156.5 EPNdB							
Full CNI (Entire Commercial Jet Fleet)	**1990**	**2000**	**2010**	**2019**	**2020**	**2021**	**Change (2019 to 2020)**	**Change (2019 to 2021)**
	156.4	**154.7**	**151.9**	**153.5**	**150.3**	**151.5**	**(3.2)**	**(2.0)**
Total Passenger Jets	155.2	153.6	150.9	153.1	149.4	150.9	(3.7)	(2.2)
Total Cargo Jets	150.1	148.2	145.1	143.0	143.1	142.7	0.1	(0.3)
Total Daytime	152.5	149.5	146.8	147.7	144.9	145.8	(2.8)	(1.9)
Total Nighttime	154.4	153.1	150.3	152.2	148.9	150.1	(3.3)	(2.1)
Daytime Passenger	N/A	149.3	146.6	147.6	144.5	145.4	(3.1)	(2.2)
Nighttime Passenger	N/A	151.6	149.0	151.7	147.7	149.4	(4.0)	(2.3)
Daytime Cargo	137.1	137.5	134.5	133.4	133.8	134.9	0.4	1.5
Nighttime Cargo	149.9	147.8	144.7	142.5	142.6	142.0	0.1	(0.5)

Source: HMMH, 2022.
Notes: General aviation and non-jet aircraft are not included in the calculation.
1 Data for other prior years prior are available in Appendix H, *Noise Abatement*.

Table H-13 in Appendix H, *Noise Abatement,* shows the relative contribution of each airline to total CNI. The table provides the number of flight operations, the contribution to CNI by airline, and the partial CNI per operation for 2019, 2020, and 2021. The data reflect the contributions of individual aircraft noise levels and the frequency with which they occur. The table is sorted by the partial CNI per operation for 2021 and shows a mix of mostly international carriers and cargo operators at the top of this list. This is due to the higher proportion of nighttime operations among these carriers, as well as the operation of larger and/or older (noisier) aircraft.

JetBlue Airways, with the largest number of operations, has the highest total CNI per airline at 148.1 EPNdB in 2019, 144.3 in 2020, and 145.5 in 2021, but its partial CNI per operation is below the other major airlines, partly due to its use of newer, quieter aircraft. The cargo airline with the most operations at Logan Airport is Federal Express (FedEx). Despite having more operations in 2020 than in 2019, the partial CNI per operation for FedEx in 2020 was less than its corresponding value for 2019. In 2021, FedEx again had more operations than the preceding year and again shows a reduction in both its overall contribution to CNI and its partial CNI by

operation. These changes are attributable to FedEx phasing out operations by older DC-10 aircraft and their increased use of B757s and B767s.

Regional carriers generally contribute the least to the partial CNI per operation whereas the international carriers, which typically operate larger aircraft and generally have more operations at night, are below the major cargo operators in rank. The relative positions for the domestic carriers are due mainly to their fleet characteristics and number of night operations.

Dwell and Persistence Reporting

Another supplemental measure of noise impact relates to the length of time for which noise impacts occur. To provide temporary relief to neighborhoods affected by regular overflights during single- or multi-day periods, the PRAS Advisory Committee in 1982 established two short-term goals for the system beyond its annual goals:

- Provide relief from excessive dwell. Exceedance is defined as more than seven hours of operations over a given area during any day between the hours of 7:00 AM and midnight.
- Provide relief from excessive persistence. Exceedance is defined as more than 23 hours of operations over an area between 7:00 AM and midnight during a period of three consecutive days.

In contrast to the annual PRAS goals that counted the number of equivalent operations on a runway, dwell and persistence are measured by the number of hours that a given location or area is subject to jet aircraft overflights. The PRAS Advisory Committee designated eight runway end combinations for computing the effects of dwell and persistence on the communities, as shown in **Table 6-11**.

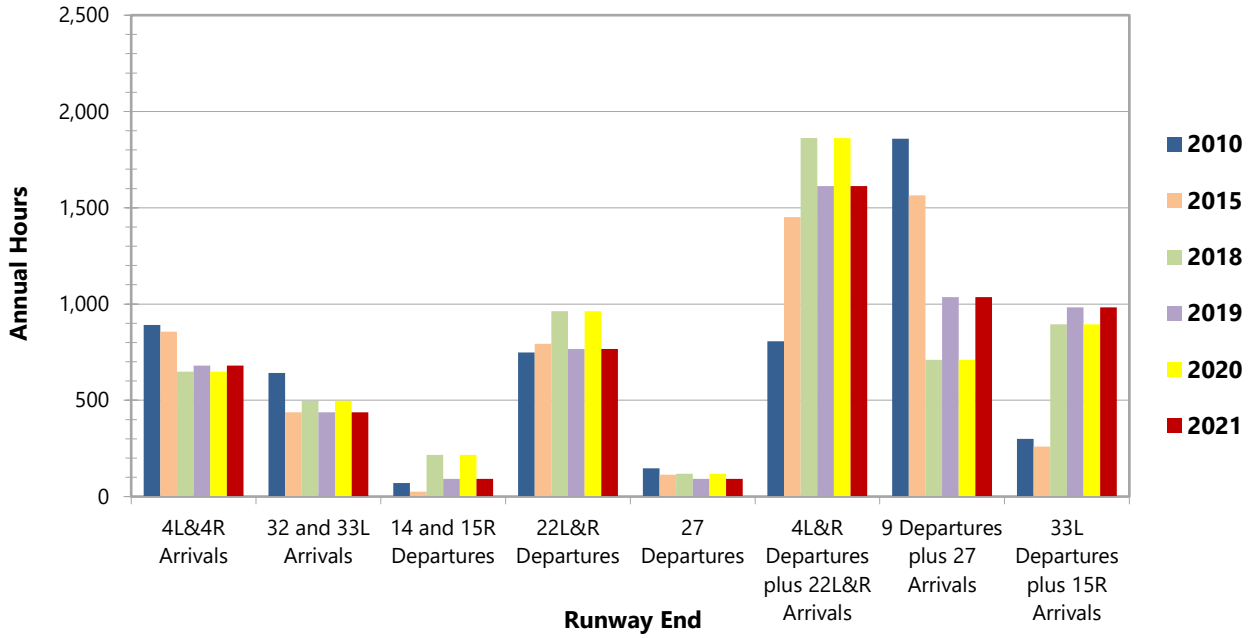
Table 6-11 Representative Neighborhoods near Logan Airport Subject to Overflights

Runway	Representative Neighborhoods
4L and 4R Arrivals	South Boston (Farragut St.), Dorchester, Quincy, Milton, Weymouth, and Braintree
32 and 33L Arrivals	Boston Harbor, Hull, Cohasset, Hingham, Scituate, and other South Shore locations
14 and 15R Departures	Boston Harbor, Hull, Cohasset, Hingham, Scituate, and other South Shore locations
22L and 22R Departures	South Boston (Farragut Street), Boston Harbor, Hull, Cohasset, Hingham, Scituate, and other South Shore locations
27 Departures	South Boston (Fan Pier), Roxbury, Jamaica Plain, South End, West Roxbury, Roslindale, Brookline, Hyde Park, and other points South and West
4L and 4R Departures and 22L and 22R Arrivals	East Boston (Bayswater, Orient Heights), Winthrop (Court Road), Revere, and Nahant
9 Departures and 27 Arrivals	Winthrop (Point Shirley), Boston Harbor, and other points North
33L Departures and 15R Arrivals	East Boston (Eagle Hill), Chelsea, Everett, Medford, Somerville, Arlington, Cambridge, Belmont, and other points South and West

Source: Massport.

As required by Massport's commitments for the Logan Airside Improvements Planning Project,[30] this *2020/2021 EDR* reports on noise dwell and persistence levels. Higher levels of dwell or persistence for over-water areas represent a benefit since this produces a corresponding decrease in total hours overpopulated areas. **Figures 6-17** and **6-18** illustrate the annual hours of dwell and persistence by runway end for 2018 through 2021, with 2010 and 2015 hours included for reference. It should be noted that the data account for the time the runway configuration was in use and does not necessarily represent operations on those runways.

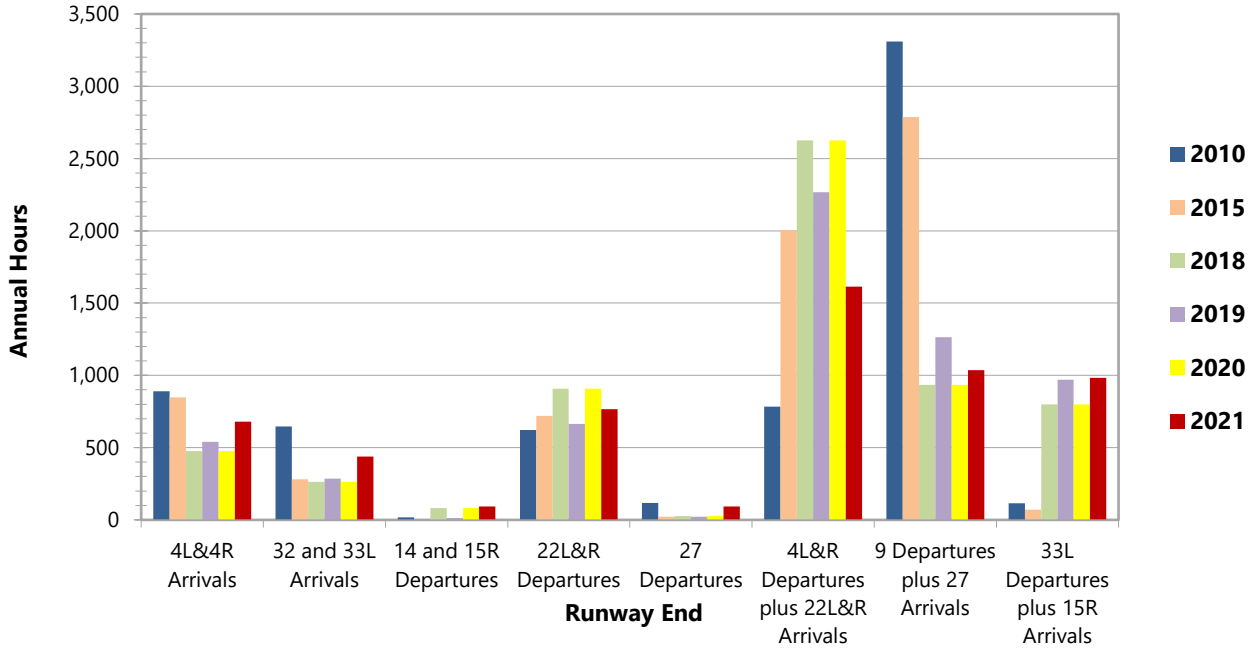
Figure 6-17 Comparison of Annual Hours of Dwell Exceedance by Runway End



Source: HMMH, 2022.

30 U.S. Department of Transportation, Federal Aviation Administration. 2002. *Logan Airside Improvements Planning Project Final Environmental Impact Statement*.

Figure 6-18 Comparison of Annual Hours of Persistence Exceedance by Runway End



Source: HMMH, 2022.

In general, dwell and persistence analysis results for 2018, 2019, 2020, and 2021 are quite similar, and reflect consistent patterns of runway usage from year to year. The graphics indicate that areas to the north of the Airport (Orient Heights and Revere; arrivals to Runways 22L or 22R or departures from Runways 4L or 4R) experienced prolonged periods of overflights most often during recent years (2018 through 2021), with some reduction in persistence in that area occurring in 2021. The most notable differences in both metrics from the earlier years (represented by 2010 and 2015) to the more recent years are the decreases over Winthrop (Runway 9 departures or Runway 27 arrivals) and the increases over East Boston towards Chelsea and Everett (Runway 33L departures or Runway 15R arrivals).

Time Above (TA)

The third supplemental noise metric reported in this *2020/2021 EDR* is the amount of time that aircraft noise is above each of three predefined threshold sound levels. The measure is referred to generally as TA, and the threshold sound levels used in the analysis are 65, 75, and 85 dBA. Like DNL values. These times are computed using the FAA-approved AEDT. The calculations are made at each of Massport's permanent noise monitoring locations and are based on an average 24-hour day during the year as well as the average nine-hour nighttime period from 10:00 PM to 7:00 AM. The threshold sound levels of 65, 75, and 85 dBA reflect different degrees of speech interference depending on factors such as whether people are outdoors, indoors with their windows open, or indoors with windows closed. **Tables 6-12** and **6-13** present a summary of the AEDT-calculated TA values for 2019, 2020, and 2021.

Table 6-12 Time Above (TA) dBA Thresholds in a 24-Hour Period for Average Day

		Minutes above Threshold									Modeled DNL (dB)[3]		
		2019			2020			2021					
Site[1]	Distance[2] (mi)	85 dBA	75 dBA	65 dBA	85 dBA	75 dBA	65 dBA	85 dBA	75 dBA	65 dBA	2019	2020	2021
1	3.7	0.0	0.1	16.2	0.0	0.0	7.8	0.0	0.1	10.4	56.4	52.2	52.2
2	2.9	0.0	1.6	25.0	0.0	0.4	11.8	0.0	0.8	16.0	59.7	55.2	55.5
3	2.5	0.0	2.7	72.7	0.0	0.4	31.3	0.0	0.4	38.5	61.8	57.7	58.0
4	1.6	8.0	45.7	116.0	2.6	14.8	38.0	3.9	22.6	56.8	71.8	66.6	69.0
5	1.9	0.1	15.4	94.2	0.0	5.7	30.5	0.0	8.9	46.3	64.9	59.9	61.7
6	0.8	0.0	0.9	61.6	0.0	0.9	35.9	0.0	1.1	42.1	62.4	59.9	60.0
7	1.0	0.7	9.5	101.3	0.1	5.5	62.7	0.1	6.4	68.6	67.3	63.6	63.5
8	1.6	0.0	3.2	44.4	0.0	1.6	25.6	0.0	2.0	28.1	62.1	58.7	59.0
9	1.3	1.0	25.4	89.7	0.2	14.7	53.1	0.2	16.5	59.5	68.8	65.3	65.9
10	1.3	0.0	4.9	52.1	0.0	2.4	30.9	0.0	3.0	34.7	62.8	59.4	59.7
11	1.8	0.0	0.8	14.0	0.0	0.3	7.9	0.0	0.4	8.7	57.6	54.4	54.6
12[5]	1.2	0.1	9.7	91.9	0.0	4.3	50.0	0.0	5.2	58.6	66.0	62.0	62.6
13	1.9	0.1	8.8	46.8	0.0	4.4	25.0	0.0	5.9	31.2	63.9	60.4	61.5
14	1.2	0.0	3.5	38.6	0.0	0.2	34.7	0.0	0.3	38.1	61.8	58.9	58.6
15	2.8	0.8	24.7	58.8	0.0	0.9	21.0	0.0	1.5	25.6	61.6	57.6	59.1
16	2.4	0.0	0.9	53.5	0.4	13.8	34.0	0.4	15.9	38.2	69.2	65.9	66.7
17	5.3	0.0	0.0	0.2	0.0	0.6	29.9	0.0	0.5	33.9	61.8	58.3	59.1
18	5.9	0.0	0.0	0.5	0.0	0.0	0.1	0.0	0.0	0.0	45.9	43.3	43.1
19	8.7	0.0	0.0	13.0	0.0	0.0	0.0	0.0	0.0	0.1	45.5	42.7	43.0
20	8.4	0.0	0.0	14.3	0.0	0.0	7.3	0.0	0.0	7.9	56.4	52.9	53.5
21	4.5	0.0	0.1	11.3	0.0	0.2	9.0	0.0	0.1	10.2	55.0	53.2	53.5
22	6	0.0	0.0	20.8	0.0	0.0	3.9	0.0	0.0	4.6	54.6	50.4	51.5
23	6.3	0.0	0.0	7.8	0.0	0.0	7.8	0.0	0.0	10.2	55.9	51.7	53.0
24	8.1	0.0	0.0	0.2	0.0	0.0	2.7	0.0	0.0	3.5	54.0	50.0	51.3
25	4.2	0.0	0.1	29.9	0.0	0.0	0.1	0.0	0.0	0.2	50.5	47.2	46.8
26	6	0.0	0.0	12.7	0.0	0.0	16.2	0.0	0.0	21.0	59.7	56.9	57.9
27	5.3	0.0	0.0	3.2	0.0	0.0	5.7	0.0	0.1	7.8	54.8	50.3	50.7
28	7.7	0.0	0.0	0.2	0.0	0.0	1.2	0.0	0.0	1.7	51.6	47.1	47.4
29	7.3	0.0	0.2	15.6	0.0	0.0	0.0	0.0	0.0	0.0	48.6	44.5	44.5
30	1.5	0.0	3.5	38.6	0.0	0.1	10.7	0.0	0.1	10.5	59.0	55.9	55.7
Average TA Value[4]		0.4	5.3	38.7	0.1	2.4	19.8	0.2	3.1	23.8	59.0	55.4	56.0

Source: HMMH, 2022

Notes: dBA - A-weighted decibel; dB – decibel; DNL - Day-Night Average Sound Level.

1 Site numbers correlate with the Figure 6-16 map and the addresses listed in Table 6-8

2 Distance from Logan Airport calculated from the Airport Reference Point.

3 2019 modeled with AEDT version 3c, 2020 and 2021 modeled with AEDT version 3d

4 Arithmetic average includes all noise monitoring sites.

5 Site 12 was relocated to Coleridge Street, East Boston in 2018.

Table 6-13 Time Above (TA) dBA Thresholds in a Nine Hour Night Period for Average Day[3]

		Minutes above Threshold									Modeled DNL (dB)[4]		
		2019			2020			2021					
Site[1]	Distance[2] (mi)	85 dBA	75 dBA	65 dBA	85 dBA	75 dBA	65 dBA	85 dBA	75 dBA	65 dBA	2019	2020	2021
1	3.7	0.0	0.0	4.1	0.0	0.0	1.4	0.0	0.0	1.1	56.4	52.2	52.2
2	2.9	0.0	0.5	6.1	0.0	0.1	2.1	0.1	0.1	1.6	59.7	55.2	55.5
3	2.5	0.0	0.1	10.5	0.0	0.0	4.2	0.0	0.0	4.4	61.8	57.7	58.0
4	1.6	1.2	5.7	15.4	0.3	1.6	4.7	2.2	2.2	6.1	71.8	66.6	69.0
5	1.9	0.0	1.8	11.8	0.0	0.6	3.3	0.7	0.7	4.4	64.9	59.9	61.7
6	0.8	0.0	0.2	10.8	0.0	0.2	5.8	0.2	0.2	5.5	62.4	59.9	60.0
7	1	0.2	1.6	20.9	0.0	0.9	10.0	0.7	0.7	9.1	67.3	63.6	63.5
8	1.6	0.0	0.5	10.4	0.0	0.3	4.4	0.2	0.2	5.0	62.1	58.7	59.0
9	1.3	0.2	6.1	18.9	0.1	2.5	7.9	3.0	3.0	8.5	68.8	65.3	65.9
10	1.3	0.0	0.6	10.9	0.0	0.3	5.2	0.3	0.3	5.3	62.8	59.4	59.7
11	1.8	0.0	0.1	2.2	0.0	0.0	1.0	0.0	0.0	0.7	57.6	54.4	54.6
12[6]	1.2	0.1	2.6	19.5	0.0	0.9	9.1	1.0	1.0	10.2	66.0	62.0	62.6
13	1.9	0.1	1.7	7.5	0.0	0.9	3.9	1.1	1.1	4.5	63.9	60.4	61.5
14	1.2	0.0	0.1	11.7	0.0	0.0	5.9	0.0	0.0	4.1	61.8	58.9	58.6
15	2.8	0.0	0.9	6.0	0.0	0.2	3.2	0.5	0.5	3.6	61.6	57.6	59.1
16	2.4	0.2	6.1	13.6	0.1	2.4	5.3	3.1	3.1	6.7	69.2	65.9	66.7
17	5.3	0.0	0.2	13.4	0.0	0.2	5.2	0.1	0.1	6.7	61.8	58.3	59.1
18	5.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	45.9	43.3	43.1
19	8.7	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	45.5	42.7	43.0
20	8.4	0.0	0.0	3.9	0.0	0.0	1.7	0.0	0.0	1.9	56.4	52.9	53.5
21	4.5	0.0	0.0	2.5	0.0	0.0	1.5	0.0	0.0	1.6	55.0	53.2	53.5
22	6	0.0	0.0	2.2	0.0	0.0	0.8	0.0	0.0	1.1	54.6	50.4	51.5
23	6.3	0.0	0.0	3.0	0.0	0.0	1.4	0.0	0.0	1.9	55.9	51.7	53.0
24	8.1	0.0	0.0	1.1	0.0	0.0	0.5	0.0	0.0	0.6	54.0	50.0	51.3
25	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.5	47.2	46.8
26	6	0.0	0.0	9.3	0.0	0.0	4.6	0.0	0.0	6.3	59.7	56.9	57.9
27	5.3	0.0	0.0	3.2	0.0	0.0	1.0	0.0	0.0	0.8	54.8	50.3	50.7
28	7.7	0.0	0.0	0.9	0.0	0.0	0.3	0.0	0.0	0.2	51.6	47.1	47.4
29	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	48.6	44.5	44.5
30	1.5	0.0	0.0	4.0	0.0	0.0	2.2	0.0	0.0	1.3	59.0	55.9	55.7
Average TA Value[5]		0.1	1.0	7.5	0.0	0.4	3.2	0.4	0.4	3.4	59.0	55.4	56.0

Source: HMMH, 2022

Notes: dBA - A-weighted decibel; dB – decibel; DNL - Day-Night Average Sound Level.

1 Site numbers correlate with the **Figure 6-16** map and the addresses listed in **Table 6-8**.

2 Distance from Logan Airport calculated from the Airport Reference Point.

3 Nine-hour nighttime period from 10:00 PM – 7:00 AM.

4 2019 modeled with AEDT version 3c, 2020 and 2021 modeled with AEDT version 3d.

5 Arithmetic average includes all noise monitoring sites.

6 Site 12 was relocated to Coleridge Street, East Boston in 2018.

Noise Abatement Efforts

Massport's noise abatement program continues to play a critical role in helping to limit and monitor noise impacts. Massport's emphasis on noise abatement has focused on the benefits of better analysis tools, involvement in noise research projects, and improved modeling techniques to identify the causes of noise problems. Massport also continues to coordinate with FAA and the Massport CAC on matters related to runway use and the ongoing RNAV Pilot project.

Massport's NOMS, installed in 2008, includes extensive analysis and mapping capabilities, the latest FAA NextGen radar data feed, use of multilateration radar (a separate and unique source of operational data), improved noise complaint handling, and direct correlation of noise events with radar flight paths and complaints (a feature that the prior system did not have). This latter capability has improved the ability of the system to differentiate between aircraft and community noise sources. All measured data and complaint information in this report were generated through the NOMS. Another important feature of this system is the public flight tracking interface which allows the public to view, identify and report aircraft operations to Massport. Massport evaluated the current system in early 2018 and went out to bid for an upgraded NOMS in late 2018. The prior vendor L3Harris was selected and in 2019 L3Harris began upgrading the system including additional reports and the option for Virtual Noise Monitors (VNM). Massport has replaced the equipment for 29 permanent noise monitors. Massport, in collaboration with the South End community, identified a preferred location for Site 1. The new site should be operational by late 2022.

The Logan Airport noise mitigation program includes operational restrictions on certain runways, limits to engine runup locations, late night runway preference, and noise abatement turns. Other continuing elements of Massport's noise mitigation program are discussed below.

Residential Sound Insulation Program

- In accordance with FAA requirements, Massport has one of the most extensive residential and school sound insulation programs in the nation. To date, Massport has installed sound insulation in 5,467 residences, including 11,515 dwelling units, and 36 schools in East Boston, Roxbury, Dorchester, Winthrop, Revere, Chelsea, and South Boston. Historically, the percentage of eligible homeowners who have responded and whose dwellings are ultimately treated varies significantly by community from a high of nearly 90 percent in Revere to a low of about 50 percent in South Boston. Approximately 80 to 85 percent of homeowners in East Boston and Winthrop have historically participated. Approximately 8 percent of applicants also choose the Room-of-Preference option that allows the owner to identify a room (usually a bedroom or living room) for extra acoustical treatment.
- Eligibility for sound insulation must follow FAA guidelines which state that the residence must be located within the latest DNL 65 dB contour submitted to the FAA and a noncompatible structure must be experiencing existing interior noise levels within habitable rooms that are 45 dB or greater with the windows closed to be considered eligible.[31] Also, structures constructed after October 1, 1998 are not eligible and structures that do not meet building codes are not eligible until the building's deficiencies

31 FAA Airport Improvement Handbook, Appendix R.

have been addressed. The FAA will allow a residence to be treated under the sound insulation program one time; homes treated previously after 1993 are not eligible for additional consideration.[32]

- In January 2020, Massport's CEO sent a letter to the FAA Associate Administrator requesting that Massport and the FAA work together to address re-treatment of homes that were sound insulated during the early years of the program, potentially upgrading treatments in eligible homes with newer, more effective, and more durable materials. The Associate Administrator responded that the FAA was exploring limited circumstances under which Massport might be able to re-assess homes that had been mitigated before the FAA first issued sound insulation standards in 1993. The first step in this process was for Massport to submit an updated RSIP Noise Exposure Map (NEM).
- Massport submitted an AEDT-derived 2019 NEM to FAA in 2020 for review and discussion. At that time, the FAA had requested that the updated sound insulation program contour represent 2019 operational conditions due to the significant reduction in aircraft operations in 2020 resulting from the COVID-19 pandemic. It was subsequently determined by FAA that a 2020 NEM would be more appropriate. It is recognized that as air traffic activity rebounds, the DNL contours will grow and Massport will update subsequent NEMs so that the RSIP will continue to be based on the latest Logan Airport noise environment.
- FAA accepted the 2020 NEM on December 20, 2021, and Massport is in the process of re-starting its RSIP. Massport selected a consulting team who will survey eligible program areas to identify potentially eligible properties that meet the FAA's new criteria for a pilot program. In 2022, Massport applied for and was approved for an initial grant by the FAA to fund the beginning phase of the RSIP program. Appendix H, *Noise Abatement* contains data on the residential buildings, dwelling units, and schools which have been sound insulated by Massport.

Other Massport Noise Initiatives

- Massport develops and publishes annual noise contours (**Figures 6-12** through **6-14** present contours for 2020 and 2021).
- Massport's website features a web-based flight tracking system known as PublicVue.[33] The PublicVue site allows the user to view flight tracks in near-real time, replay flight tracks, and enter noise complaints.
- The Noise Office uses summary reports of operations by airline, runway, aircraft type, and other parameters to help track potential changes in the noise environment. **Tables H-13** in Appendix H, *Noise Abatement* (Partial CNI) and **6-12** (Time Above) are examples of these reports.
- Massport, in an advisory role, participated in the completed FAA BLANS process, which designed RNAV departure procedures off most runways to avoid highly populated areas and the use of an over-water visual approach at night to keep aircraft offshore as much as possible.

32 FAA Airport Improvement Handbook, Table C-5 Item (8), page C-19.

33 Massport. *Flight Monitor*. http://www.massport.com/logan-airport/about-logan/noise-abatement/flight-monitor/.

- Massport supports the Massport CAC. The Massport CAC is a state-legislated body that works with Massport on a range of Authority-wide topics, including environmental issues. Further information about the Massport CAC can be found at http://massportcac.org/.
- Massport encourages the use of reduced-engine taxiing whenever possible and encouraging the vortex generator retrofit of the Airbus A320 family.
- Massport strives to participate in research to reduce community noise levels whether through the Airport Cooperative Research Program (ACRP) or with FAA, such as the recently completed RNAV Pilot project.
- Massport has been working with the Massachusetts Institute of Technology (MIT) and FAA to evaluate PBN procedures and possible changes to these procedures as part of the RNAV Pilot project since 2016. Two measures from the first phase of this study were recently implemented.
- Massport is a member of the Aviation Sustainability Center (ASCENT), which is a coalition of 16 leading U.S. research universities and over 60 private sector stakeholders (including Massport) committed to reducing the environmental impact of aviation. Massport is actively participating in two research initiatives on aircraft noise.[34]

Airline Fleet Improvements

Commercial air carrier and cargo operators are deploying the newest engine technology at Logan Airport. **Table 6-14** reports the percent of an airline's fleet that is Stage 3, Stage 4 equivalent, or Stage 5 equivalent for 2019, 2020, and 2021. All of the major U.S. airlines at Logan Airport are using a fleet composed of 100 percent originally manufactured Stage 3, Stage 4, or Stage 5 aircraft. The majority of air carriers at Logan Airport in 2020 and 2021 are using Stage 4 or Stage 5 equivalent aircraft. As reported in **Table 6-3**, the new FAA Stage 5 requirements are met by about 29 percent of Logan Airport jet operations for 2020 and 2021.

Massport previously made terminal and airfield improvements to accommodate FAA Airplane Design Group VI aircraft, which are the largest aircraft in terms of wingspan and tail height. Use of the larger aircraft, such as the 747-800 and the A380, increased from 2017 to 2019 but dropped in 2020 and 2021 due to the pandemic. Limited use of the A380 has occurred at Logan Airport in 2022.

Use of new engine technology aircraft has also been increasing such as the A320neo family with the addition of Frontier Airline flights in 2019 and jetBlue Airways A321neo and A220 operations. Additionally, Delta Air Lines introduced Airbus A220 flights and use of Boeing 787 models. Due to the COVID-19 pandemic, several airlines accelerated the retirement of older and louder aircraft models such as the Airbus A330-200/300, A340, and Boeing 747, 757, 767, McDonnell Douglas MD-88, Embraer 190, and the smaller Bombardier CRJ200 regional jet. As aircraft operations are anticipated to return to pre-pandemic levels, it is anticipated that the mix of aircraft types will continue to transition to a newer, quieter, and more fuel-efficient fleet.

34 Ascent. Massachusetts Port Authority. https://ascent.aero/participant/massachusetts-port-authority/.

Table 6-14 Airline Operations Percentages in Original Stage 3 or Equivalent Stage 4/5 Aircraft (2019 to 2021)

Airlines with more than 100 flights	Number of Flights[1]			Percentage of Stage 3 or Equivalent Stage 4 or 5 Operations[2]								
	2019	2020	2021	2019 Stage 3	2019 Stage 4	2019 Stage 5	2020 Stage 3	2020 Stage 4	2020 Stage 5	2021 Stage 3	2021 Stage 4	2021 Stage 5
Jetblue Airways	114,091	51,873	61,898	0%	98%	2%	0%	38%	62%	0%	39%	61%
Republic Airlines	21,832	16,547	29,990	0%	100%	0%	0%	100%	0%	0%	100%	0%
Delta Air Lines	42,218	19,949	28,826	2%	86%	12%	0%	95%	5%	0%	92%	8%
American Airlines	50,333	24,815	28,474	1%	87%	12%	0%	98%	2%	0%	93%	7%
United Airlines	27,318	11,338	14,393	0%	61%	39%	0%	79%	21%	0%	76%	24%
Southwest Airlines	19,907	9,277	8,916	0%	99%	1%	0%	100%	0%	0%	95%	5%
Spirit Airlines	9,838	5,435	5,689	0%	16%	84%	0%	19%	81%	0%	3%	97%
Federal Express	3,775	4,367	4,892	4%	96%	0%	1%	99%	0%	1%	99%	0%
Endeavor Air	10,520	2,025	2,973	0%	100%	0%	0%	100%	0%	0%	100%	0%
Alaska Airlines	5,920	2,535	2,882	0%	92%	8%	0%	100%	0%	0%	83%	17%
Jazz Air Inc.	2,922	745	2,274	0%	52%	48%	50%	70%	30%	1%	99%	1%
United Parcel Service	2,096	2,258	2,183	0%	97%	3%	0%	100%	0%	0%	100%	0%
Piedmont Airlines	3,087	971	1,439	0%	0%	100%	0%	0%	100%	0%	0%	100%
Icelandair	1,044	906	1,122	0%	85%	15%	0%	32%	68%	0%	49%	51%
Frontier Airlines, Inc.	1,211	674	1,036	6%	30%	64%	0%	25%	75%	0%	35%	65%
British Airways	2,650	1,136	991	0%	23%	77%	0%	44%	56%	0%	10%	90%
Lufthansa	1,703	511	867	0%	14%	86%	0%	26%	74%	0%	1%	99%
Aer Lingus	1,860	868	655	0%	93%	7%	0%	29%	71%	0%	45%	55%
Japan Airlines	728	396	644	0%	0%	100%	0%	0%	100%	0%	0%	100%
Air France	856	402	616	0%	7%	93%	0%	8%	92%	0%	2%	98%
Envoy Airlines	396	NA	528	0%	1%	99%	N/A	N/A	N/A	100%	0%	0%
Qatar Airways	730	350	528	0%	100%	0%	0%	47%	53%	0%	0%	100%
TAP - Air Portugal	644	328	526	0%	28%	72%	0%	1%	99%	0%	0%	100%
Turkish Airlines	674	274	500	0%	0%	100%	0%	0%	100%	0%	0%	100%
Emirates Airlines	719	306	456	0%	57%	43%	0%	80%	20%	0%	100%	0%

Table 6-14 Airline Operations Percentages in Original Stage 3 or Equivalent Stage 4/5 Aircraft (2019 to 2021) (Continued)

Airlines with more than 100 flights	Number of Flights[1]			Percentage of Stage 3 or Equivalent Stage 4 or 5 Operations[2]								
	2019	2020	2021	2019 Stage 3	2019 Stage 4	2019 Stage 5	2020 Stage 3	2020 Stage 4	2020 Stage 5	2021 Stage 3	2021 Stage 4	2021 Stage 5
SATA International Airlines	809	288	409	0%	1%	99%	0%	0%	100%	0%	0%	100%
Virgin Atlantic	1,361	342	391	0%	0%	100%	0%	0%	100%	0%	0%	100%
Hawaiian Airlines	426	132	380	0%	0%	100%	0%	0%	100%	0%	0%	100%
MN Airlines, LLC	288	121	358	0%	100%	0%	0%	100%	0%	0%	100%	0%
Swiss Air	978	198	328	0%	0%	100%	0%	4%	96%	0%	3%	97%
Korean Air Lines Co., Ltd.	367	208	314	0%	0%	100%	0%	10%	90%	0%	11%	89%
KLM Royal Dutch Airlines	263	251	304	0%	98%	2%	0%	79%	21%	0%	99%	1%
Compañía Panameña de Aviación	962	188	283	0%	100%	0%	0%	100%	0%	0%	100%	0%
SkyWest Airlines	4,880	175	250	100%	0%	0%	0%	100%	0%	0%	99%	1%
Iberia Air Lines Of Spain	859	132	158	0%	59%	41%	0%	48%	52%	0%	72%	28%
Sky Regional Airlines Inc	4,345	1,795	118	0%	100%	0%	0%	100%	0%	0%	100%	0%
Atlas Air	531	480	N/A	99%	1%	0%	99%	1%	0%	N/A	N/A	N/A
Norwegian Air UK Limited	732	134	N/A	0%	0%	100%	0%	0%	100%	N/A	N/A	N/A
TAM- Linhas Aereas S.A.	476	129	N/A	0%	100%	0%	0%	100%	0%	N/A	N/A	N/A
Cathay Pacific	699	117	N/A	0%	100%	0%	0%	100%	0%	N/A	N/A	N/A

Source: Massport and HMMH, 2022.
N/A Not available.
1 Operations for some carriers differ with those in Chapter 2, *Activity Levels*, and Chapter 7, *Air Quality/Emissions Reduction,* because the table only includes jet aircraft, not turboprops, and it includes both scheduled and unscheduled air carriers.
2 Original Stage 3 means originally manufactured as a certificated Stage 3 aircraft under FAR Part 36. Stage 4 equivalent or Stage 5 equivalent means the aircraft meets Stage 4 or Stage 5 requirements, even if it is not certificated as such.

Noise Complaint Line

In 2020, Massport received 240,951 noise complaints from 72 communities, a decrease of about 10 percent from 268,929 noise complaints from 86 communities in 2019. In 2021, as the number of flights rebounded, the number of complaint calls rose to 269,867 from 83 communities. The community of Medford generated almost 45 percent of the calls in 2020 (38 percent in 2021) and has the most unique callers as well as the highest number of complaints. The total number of individual complainants decreased from 2,669 callers in 2019 to 1,037 callers in 2020, and then increased slightly to 1,204 callers in 2021.

As noted in the *2018/2019 EDR*, increased ability to submit a complaint, and increased public awareness through various community groups seem to be the main factors influencing the volume of complaints. In 2020, complaints did not drop in proportion to the drop in operations, likely due to people staying home during the pandemic and not being used to aircraft operations that previously occurred while they were at work. This trend continued in 2021 as aircraft operations increased but many people remained working from home.

Continued technological advances in both Massport's noise complaint phone system and online complaint tracking system, as well as the incorporation of third-party complaint applications, have made it easier for community members to file a complaint and to receive information about particular noise events.

In late 2018, Massport's complaint tracking system began identifying complaints that were submitted through the new Airnoise button.[35] The ability to easily submit a complaint has dramatically increased the number of complaints[36] logged in the system. Prior to 2018, the average number of complaints per individual caller (the ratio of calls to callers) varied from about 10 to 17 in a given year. This ratio has increased to about 228 complaints per caller, on average, in 2020 and 2021.

The FAA launched its nationwide Noise Complaint Initiative (NCI) in 2020 to better engage with communities on noise complaints. This initiative allows the public to submit a noise complaint or inquiry through the FAA Noise Portal, enabling the FAA to direct or respond to noise complaints more efficiently and effectively. Massport is a Partnering Airport with the FAA's Noise Portal,[37] and has a link to that portal on the noise complaint section of the Massport website.[38]

Table 6-15 is a summary of noise complaints from the Massport Noise Abatement Office. The summary table presents the fifteen communities with the greatest number of complaints for each 2020 and 2021, along with the number of callers and the corresponding numbers from 2019. The communities listed in the table represent 98 percent of the complaints in 2020 and almost 98 percent of the complaints in 2021. All remaining

35 Airnoise is a subscription service that allows the user to file a noise complaint by clicking a button. The system finds the aircraft closest to the complainer and then files a detailed noise complaint directly with Massport. https://www.airnoise.io/

36 In 2020, 82 percent of complaints were logged through Airnoise; in 2021, almost 87 percent of the complaints were logged that way.

37 Federal Aviation Administration. FAA Noise Portal. https://noise.faa.gov/noise.

38 Massport. Noise Complaints. https://www.massport.com/logan-airport/about-logan/noise-abatement/complaints/.

communities are summed together into a single line above the grand total. Appendix H, *Noise Abatement,* has a full listing of the complaints by community.

Table 6-15 Noise Complaint Line Summary

	2019		2020		2021		Change in Calls	
Town	**Calls**	**Callers**	**Calls**	**Callers**	**Calls**	**Callers**	**2019 to 2020**	**2019 to 2021**
Arlington	7,021	77	8,602	35	10,017	30	1,581	2,996
Chelmsford	1,931	2	438	2	1,201	3	(1,493)	(730)
Jamaica Plain	17,132	108	7,535	45	1,975	56	(9,597)	(15,157)
Malden	15,414	34	17,923	30	6,324	24	2,509	(9,090)
Marblehead	1,291	14	1,624	7	2,742	16	333	1,451
Medford	98,021	712	107,721	234	102,182	210	9,700	4,161
Melrose	1,967	4	2,281	3	1,488	3	314	(479)
Milton	41,575	219	25,513	97	17,454	77	(16,062)	(24,121)
Revere	291	95	50	25	12,389	29	(241)	12,098
Roslindale	2,975	78	895	30	4,157	40	(2,080)	1,182
Roxbury	5,151	24	1,448	11	3,548	21	(3,703)	(1,603)
Somerville	28,070	229	26,737	73	26,565	108	(1,333)	(1,505)
South End	5,309	27	3,144	20	359	14	(2,165)	(4,950)
Watertown	3,709	28	2,464	11	2,710	18	(1,245)	(999)
West Roxbury	5,239	27	1,715	10	1,097	11	(3,524)	(4,142)
Winchester	9,143	15	14,657	16	15,329	19	5,514	6,186
Winthrop	8,121	201	13,861	76	54,166	85	5,740	46,045
Total (for towns listed above)	**252,360**	**1,894**	**236,608**	**725**	**263,703**	**764**	**(15,752)**	**11,343**
Total Complaints from Other Towns	16,569	775	4,343	312	6,164	440	(12,226)	(10,405)
Overall Totals	**268,929**	**2,669**	**240,951**	**1,037**	**269,867**	**1,204**	**(27,978)**	**938**

Source: Massport, 2022.

Notes: Changes in ( ) represent a decrease in noise complaints.
The top fifteen communities for each year are listed above. The complete list of complaints is in Appendix H, *Noise Abatement*. In late 2018, Massport added the option to submit complaints through the Airnoise button, which has dramatically increased complaints logged in the system.

Airbus A320 Vortex Generators

Figure 6-19 Vortex Generator Device by Port on Wing

Massport encourages operators to use idle or reduced reserve thrust during landing, and to retrofit the Airbus A319/320/321 family of aircraft with vortex generators, which reduce tonal noise on approach. A vortex generator is a small device that disrupts wind over ports on the wing. Without the device, the wind can produce a "whistling" tone during the aircraft's approach into an airport. All Airbus A319/320/321 built after 2014 already come equipped with the Vortex Generator. United Airlines announced it was retrofitting its aircraft in 2017 as they went in for service. In a press release in October 2018, jetBlue Airways (the largest air carrier operator at Logan Airport) announced plans to retrofit its older Airbus fleet with Vortex Generators. **Figure 6-19** shows an example of the device. American Airlines has also almost completed the upgrade to their fleet. These changes reflect the partnership between Massport and the airlines to reduce aircraft noise to benefit surrounding communities. As airlines retrofit aircraft and transition to the newer models of the A320 family, the number of aircraft operating at Logan Airport without the vortex generators is expected to decrease.

FAA and Massport RNAV Pilot Project

Over the last several years, FAA implementation of Performance-Based Navigation (PBN) procedures – including RNAV – has resulted in a concentration of flights. On October 7, 2016, FAA signed a Memorandum of Understanding (MOU) with Massport[39] to frame the process for analyzing opportunities to reduce noise through changes or amendments to PBN. Massport worked with FAA and others to develop test projects designed to help address the concentration of noise from PBN. Massport proposed several ideas for a test program with FAA to better define the implications of flight concentration on the community. This program, supported by the FAA, studied possible strategies to address neighborhood concerns. This was a first-in-the-nation project between FAA and an airport operator that includes analyzing the feasibility of changes to some RNAV approaches and departures from Logan Airport. FAA and Massport committed to: (1) analyze the feasibility; (2) measure and model the benefits and impacts of changing some RNAV approaches; and (3) test and develop an implementation plan, which will include environmental analysis and community/public outreach.

The project was structured in two phases, or "blocks". Block 1 recommendations were those that would not result in shifting noise from one area to another, and that would not have significant operational/technical implications. A report on Block 1 recommendations was completed in December 2017. Block 2 recommendations were those that could result in noise increases in some areas or face technical barriers that would require further review. The RNAV technical team, led by MIT, completed the Block 2 report which was released in December 2021.

39 Massport. October 7, 2016. *Massport and FAA Work to Reduce Overflight Noise.* https://www.massport.com/news-room/news/massport-and-faa-work-to-reduce-overflight-noise/.

Block 1

Following the completion of Block 1, the Massport CAC voted to approve and recommend implementation of the four Block 1 procedures. On December 20, 2017, Massport sent a request for FAA review and implementation of the Block 1 recommendations. A copy of the letter is provided in *2017 ESPR*. Two of the recommendations have not moved forward (restricting climb speed to 220 knots due to flyability issues and modifications to Runway 22 RNAV SIDs due to airspace conflicts). The other two recommendations have progressed; the development of an RNAV visual approach to Runway 33L and the modification of the Runway 15L RNAV SID which would shift departures further away from Hull. The Runway 33L RNAV approach is similar to the jetBlue Airways RNAV visual Special to Runway 33L already in place but would be a published procedure for all airlines to use. A copy of the Massport request to FAA from April 2017 was also published in the *2017 ESPR*. Since the Block 1 recommendations were sent, FAA and Massport have further refined the procedures and presented the FAA's recommended options to the Massport CAC in January of 2020. On November 12, 2020, Massport submitted a request to the FAA for review and implementation of two procedures at Logan Airport. These include modifying the existing RNAV SID from Runway 15R to move tracks over water, and a new over-water Required Navigational Performance (RNP)[40] approach for users with the capability to utilize this more precise PBN procedure. A copy of the Block 1 letter is included as **Figure 6-20**. The FAA completed development of these procedures and published the procedures in December 2021.

Block 2

The RNAV study team completed the evaluation of the Block 2 options in June 2021. Block 2 procedures were more complex due to potential operational/technical barriers or equity issues. Procedures considered as part of Block 2 were RNAV or RNP approaches to Runway 22L and Runway 4R, continuous descent RNAV profiles, heading-based departures from Runway 22L and Runway 22R, and dispersed headings from Runway 33L and 27. The Runway 33L, Runway 22L and Runway 22R departure concepts were presented to major airline representatives and FAA in May 2020.

At the request of the Massport CAC, FAA agreed to take an initial look at the feasibility of these options by August 2020. FAA assembled a panel of stakeholders consisting of representatives from the airline industry, the FAA Air Traffic Organization (Mission Support Services, Air Traffic Services, System Operations, and the National Air Traffic Controllers Association), the FAA Office of Environment and Energy, and FAA Flight Standards. FAA and industry stakeholders completed their initial review of the proposed procedures and determined that none of the procedures would be recommended for further evaluation.

The RNAV study team and FAA worked to revise several of the procedures for possible implementation and developed several additional procedures. These were presented during a public meeting in September 2021 and to the Massport CAC for review. Massport and MIT completed the RNAV study at the end of 2021 and the Massport CAC considered each measure during its December 2021 meeting. In January 2022, the Massport

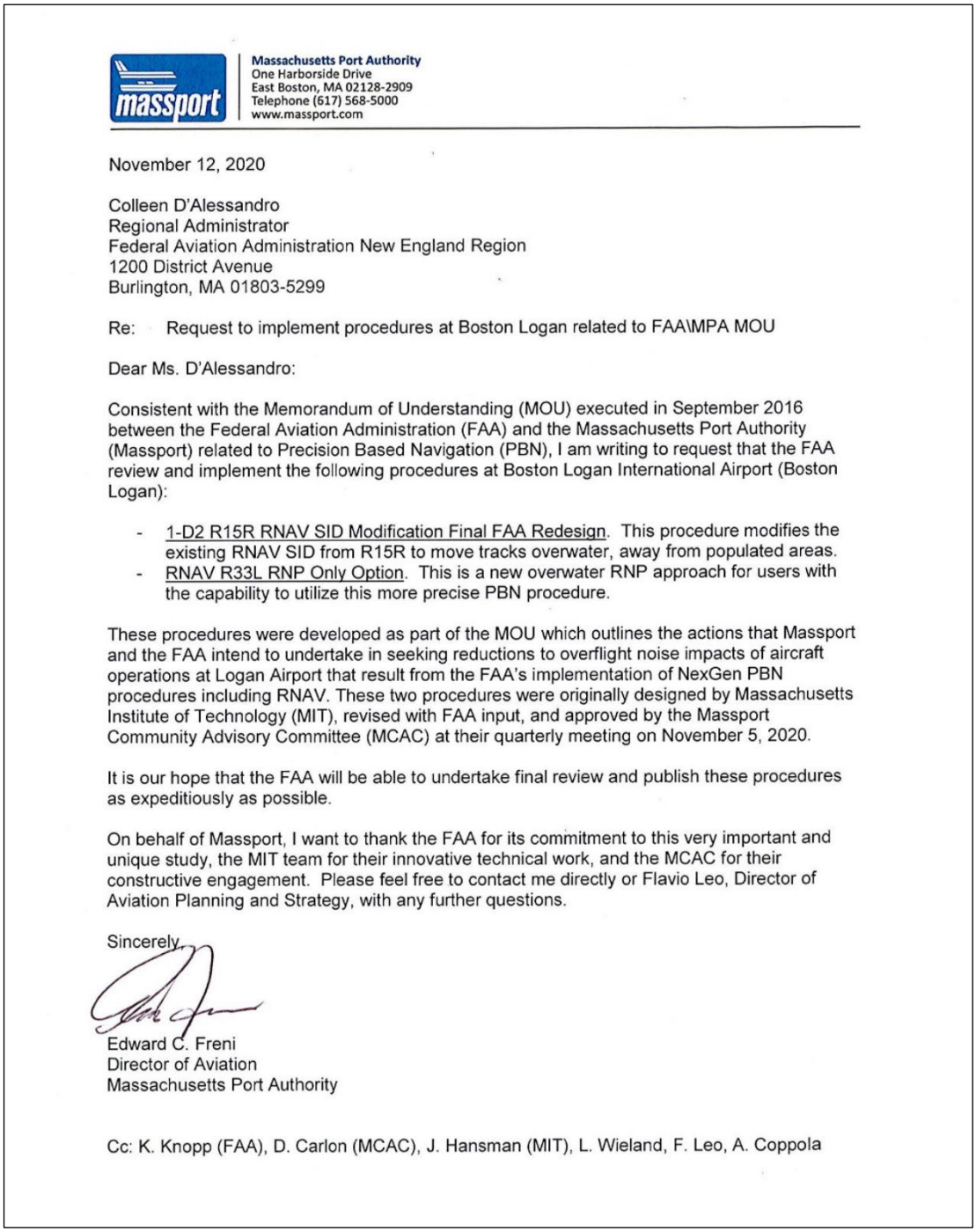
40 Required Navigational Performance (RNP) procedures provide a precise flight path both laterally and vertically for aircraft on approach.

CAC put forth two of the procedures for further study and implementation by FAA. The Block 2 report can be reviewed on the MIT website.[41] On January 19, 2022, Massport submitted a request to the FAA for review and implementation of two Block 2 procedures at Logan Airport. These include modifying the existing RNAV SID from Runways 22R and 22L to enable an earlier turn to the east, and adding a new over-water RNAV approach for Runway 22L. A copy of the Block 2 letter is included as **Figure 6-21**.

Massport continues to coordinate with the Massport CAC, the FAA, and MIT on targeted, follow-on technical questions and reviews.

41 MIT Libraries. Block 2 Procedure Recommendations for Boston Logan Airport Community Noise Reduction. September 8, 2021. https://dspace.mit.edu/handle/1721.1/131242.

Figure 6-20 Massport Request to FAA for Block 1 Recommendations



Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909
Telephone (617) 568-5000
www.massport.com

November 12, 2020

Colleen D'Alessandro
Regional Administrator
Federal Aviation Administration New England Region
1200 District Avenue
Burlington, MA 01803-5299

Re: Request to implement procedures at Boston Logan related to FAA\MPA MOU

Dear Ms. D'Alessandro:

Consistent with the Memorandum of Understanding (MOU) executed in September 2016 between the Federal Aviation Administration (FAA) and the Massachusetts Port Authority (Massport) related to Precision Based Navigation (PBN), I am writing to request that the FAA review and implement the following procedures at Boston Logan International Airport (Boston Logan):

- 1-D2 R15R RNAV SID Modification Final FAA Redesign. This procedure modifies the existing RNAV SID from R15R to move tracks overwater, away from populated areas.
- RNAV R33L RNP Only Option. This is a new overwater RNP approach for users with the capability to utilize this more precise PBN procedure.

These procedures were developed as part of the MOU which outlines the actions that Massport and the FAA intend to undertake in seeking reductions to overflight noise impacts of aircraft operations at Logan Airport that result from the FAA's implementation of NexGen PBN procedures including RNAV. These two procedures were originally designed by Massachusetts Institute of Technology (MIT), revised with FAA input, and approved by the Massport Community Advisory Committee (MCAC) at their quarterly meeting on November 5, 2020.

It is our hope that the FAA will be able to undertake final review and publish these procedures as expeditiously as possible.

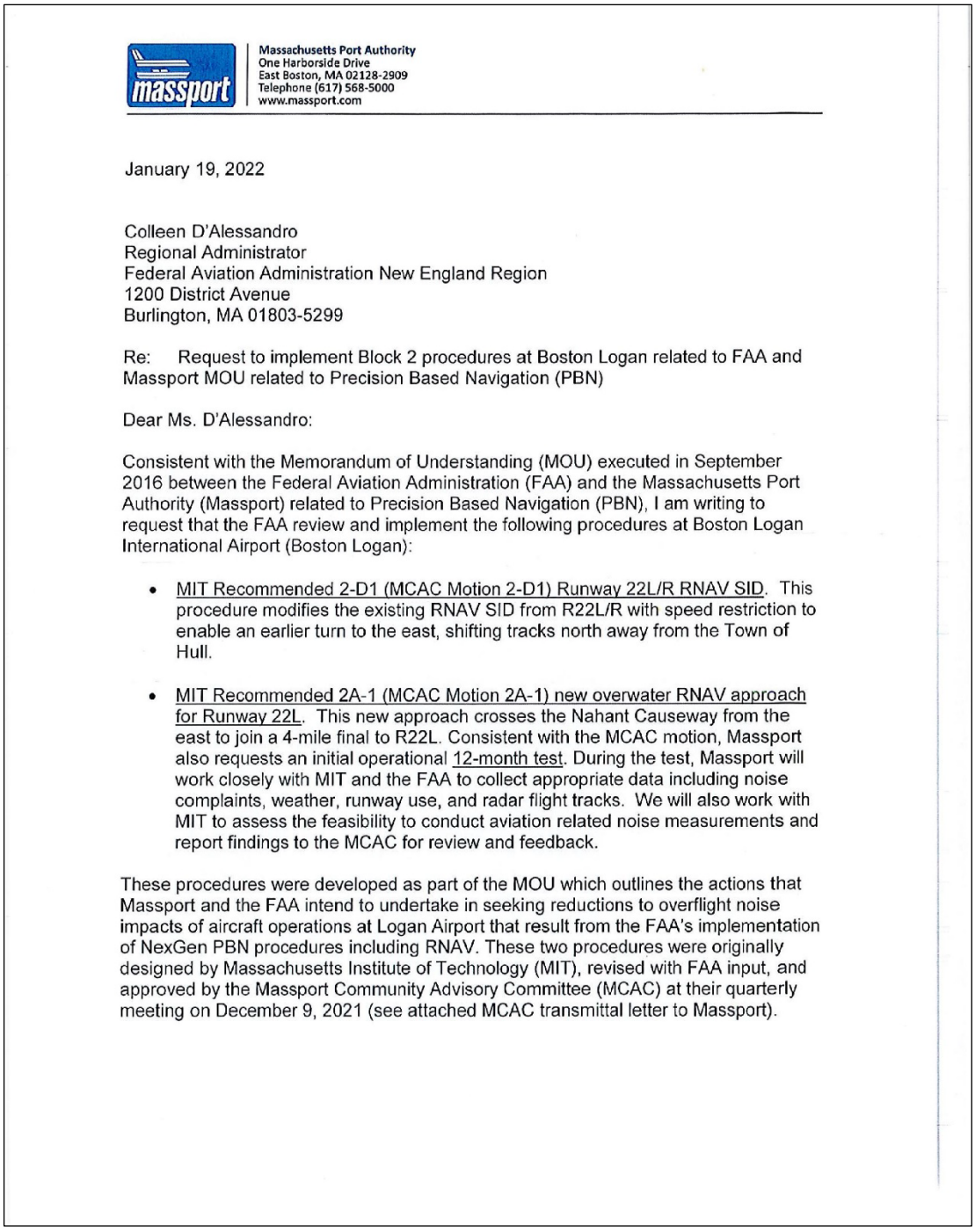
On behalf of Massport, I want to thank the FAA for its commitment to this very important and unique study, the MIT team for their innovative technical work, and the MCAC for their constructive engagement. Please feel free to contact me directly or Flavio Leo, Director of Aviation Planning and Strategy, with any further questions.

Sincerely,

Edward C. Freni
Director of Aviation
Massachusetts Port Authority

Cc: K. Knopp (FAA), D. Carlon (MCAC), J. Hansman (MIT), L. Wieland, F. Leo, A. Coppola

Figure 6-21 Massport Request to FAA for Block 2 Recommendations



Massachusetts Port Authority
One Harborside Drive
East Boston, MA 02128-2909
Telephone (617) 568-5000
www.massport.com

January 19, 2022

Colleen D'Alessandro
Regional Administrator
Federal Aviation Administration New England Region
1200 District Avenue
Burlington, MA 01803-5299

Re: Request to implement Block 2 procedures at Boston Logan related to FAA and Massport MOU related to Precision Based Navigation (PBN)

Dear Ms. D'Alessandro:

Consistent with the Memorandum of Understanding (MOU) executed in September 2016 between the Federal Aviation Administration (FAA) and the Massachusetts Port Authority (Massport) related to Precision Based Navigation (PBN), I am writing to request that the FAA review and implement the following procedures at Boston Logan International Airport (Boston Logan):

- MIT Recommended 2-D1 (MCAC Motion 2-D1) Runway 22L/R RNAV SID. This procedure modifies the existing RNAV SID from R22L/R with speed restriction to enable an earlier turn to the east, shifting tracks north away from the Town of Hull.

- MIT Recommended 2A-1 (MCAC Motion 2A-1) new overwater RNAV approach for Runway 22L. This new approach crosses the Nahant Causeway from the east to join a 4-mile final to R22L. Consistent with the MCAC motion, Massport also requests an initial operational 12-month test. During the test, Massport will work closely with MIT and the FAA to collect appropriate data including noise complaints, weather, runway use, and radar flight tracks. We will also work with MIT to assess the feasibility to conduct aviation related noise measurements and report findings to the MCAC for review and feedback.

These procedures were developed as part of the MOU which outlines the actions that Massport and the FAA intend to undertake in seeking reductions to overflight noise impacts of aircraft operations at Logan Airport that result from the FAA's implementation of NexGen PBN procedures including RNAV. These two procedures were originally designed by Massachusetts Institute of Technology (MIT), revised with FAA input, and approved by the Massport Community Advisory Committee (MCAC) at their quarterly meeting on December 9, 2021 (see attached MCAC transmittal letter to Massport).

Figure 6-21 (Continued) Massport Request to FAA for Block 2 Recommendations

On behalf of Massport, I want to thank the FAA for its commitment to this very important and unique study, the MIT team for their innovative technical work, and the MCAC for their constructive engagement. We look forward to collaborating with you and MIT during the review and implementation process for these two procedures.

Please feel free to contact me directly or Flavio Leo, Director of Aviation Planning and Strategy, with any further questions.

Sincerely,

Edward C. Freni
Director of Aviation
Massachusetts Port Authority

Cc: K. Knopp (FAA); R. Bongiovanni (MCAC); J. Hansman (MIT); L. Wieland, A. Coppola, T. Butler, F. Leo (Massport)

Attachment

FAA Runway 4L RNAV Approach Environmental Assessment (EA)

The FAA proposed an improved approach procedure to Runway 4L. Runway 4L is currently only available during visual weather conditions and an improved approach procedure would allow Runway 4L to be available during some reduced weather conditions. This procedure was originally evaluated in 2015 during a temporary test and the FAA committed at that time to conduct a federal Environmental Assessment (EA). The test and evaluation were reported in the *2015 EDR*.

The FAA EA evaluated a permanent RNAV Runway 4L approach procedure to provide a de-conflicted stabilized approach procedure that provides vertical and lateral guidance when weather or winds require aircraft to land on Runway 4L. The FAA began this process in October 2019 and provided a status presentation to the Massport CAC during its January 2020 meeting. The Draft EA was available for public review and public workshops were held by the FAA in the October 2020. A Finding of No Significant Impact (FONSI) was issued in March 2022 along with the Final EA report.[42,43] Implementation is expected in late 2022; the procedure was published in November 2022.

Reduced-Engine Taxiing

Single- or reduced-engine taxiing has the potential to reduce noise at Logan Airport. When used, the largest noise benefit is achieved by reducing the use of the engines on the side of the aircraft closest to the community. However, this is not always practicable due to airline procedures, taxiway routings, and safety considerations. Massport has reached out to the airlines and encouraged the use of this procedure whenever practicable.

In 2009, MIT, in cooperation with Massport and the FAA, conducted a survey of pilots at Logan Airport and found that the procedure was widely used on arrivals but not frequently used on departures.[44] Key reasons cited for not using the procedure were safety-related or practical reasons such as a short taxi time. The survey indicated that for the procedure to be considered for arrivals, the taxi-in time would have to exceed 10 minutes and for departures, exceed 20 minutes.

The average taxi-out times for Logan Airport exceeding 20 minutes historically occurred during two periods of the day; in the early morning and in the evening. During 2020 and 2021, due to lower level of operations, average taxi out times did not exceed 20 minutes during any hour of the day. Historically, the average taxi-in time did not exceed 10 minutes, however in 2019 it was exceeded during 6:00 to 8:00 PM. During 2020 and

42 U.S. Department of Transportation. *Final Environmental Assessment, Boston Logan RNAV (GPS) RWY 4L*. https://www.faa.gov/air_traffic/community_engagement/bos/media/Full-Final-EA-with-Appendices.pdf.

43 U.S. Department of Transportation. Federal Aviation Administration*. Finding of No Significant Impact and Record of Decision, Boston Logan RNAV (GPS) RWY 4L Environmental Assessment*. https://www.faa.gov/air_traffic/community_engagement/bos/media/Final-EA-with-Appendices.pdf.

44 The full report was published in the *2009 EDR* in Appendix L, *Survey of Airline Pilots Regarding Fuel Conservation Procedures for Taxi Operations*.

2021, due to lower level of operations, average taxi in times did not exceed 10 minutes during any hour of the day.

The average taxi-out time at Logan Airport decreased over the three-year period from 2019 to 2021 (19.4 minutes in 2019, 15.6 minutes in 2020, and 15.7 minutes in 2021). The average taxi-in time also decreased over the three-year period (8.6 minutes in 2019, 6.7 minutes in 2020, and 6.7 minutes in 2021). Overall, the average taxi/delay time decreased over the three-year period (14.0 minutes in 2019, 11.2 minutes in 2020, and 11.2 minutes in 2021).[45]

Mandatory single engine taxiing was also one of the proposed measures in the BLANS but was rejected by FAA due to safety concerns. The voluntary process remains in effect.

Ongoing Noise Studies

Massport keeps up to date with noise related studies and requirements undertaken by the FAA, academia, and other entities. As part of the October 2018 FAA Reauthorization, FAA was directed to address issues related to aviation noise research including:

- Sec. 173. Alternative Airplane Noise Metric Evaluation Deadline: Requires FAA to complete research on alternative noise metrics as a possible replacement to DNL within one year. FAA forwarded its Report to Congress in April 2020 as described under the Noise Metrics section above. FAA is considering how these findings will be used.
- Sec. 187. Aircraft Noise Exposure: Requires that the FAA complete "ongoing review of the relationship between aircraft noise exposure and its effects on communities" within two years. It specifically requires FAA to revise its Part 150 land use compatibility guidelines (14 CFR 150). The Neighborhood Environmental Survey (NES) was released in January 2021. The FAA is considering public and other stakeholder input and has not made any determinations yet on the findings.
- Sec. 189. Study on Potential Health and Economic Impacts of Overflight Noise: Requires FAA to engage a university to conduct a health study in a number of metropolitan areas (Boston, Chicago, the District of Columbia, New York, the Northern California Metroplex, Phoenix, the Southern California Metroplex, Seattle, or such other area as may be identified by the FAA), focusing on: "incremental health impacts on residents living partly or wholly underneath flight paths most frequently used by aircraft flying at an altitude lower than 10,000 feet, including during takeoff or landing"; and "an assessment of the relationship between a perceived increase in aircraft noise, including as a result of a change in flight paths that increases the visibility of aircraft from a certain location, and an actual increase in aircraft noise, particularly in areas with high or variable levels of non-aircraft-related ambient noise." FAA initiated a study on cardiovascular disease and aircraft noise exposure through its ASCENT Center of Excellence for Alternative Jet Fuels and Environment. This research is ongoing and is being led by Boston University.

45 FAA Aviation System Performance Metrics: Avg. Taxi Time: Standard Report.

The FAA has a number of ongoing research studies aimed to support policymaking around aviation noise:

- The Neighborhood Environmental Survey[46]: is a multi-year effort to update the scientific evidence on the relationship between aircraft noise exposure and its effects on communities around airports. This is the study referenced in FAA Reauthorization Section 187.
- ASCENT research on sleep disturbance[47]: The long-term goal of this project is to understand the relationship between aircraft noise and sleep disturbance in the United States. This project's researchers are investigating the use of actigraphy and electrocardiography as a cost-effective tool for studying large cohorts of people.

In addition to tracking FAA-related studies, Massport is also closely following international research on the state of the science around effects of aircraft noise on people including:

- The International Civil Aviation Organization's (ICAO) Committee on Aviation Environmental Protection (CAEP). Massport is reviewing ongoing research and information as part of each CAEP cycle such as the ICAO Guidance Document *Operational Opportunities to Reduce Aircraft Noise*.
- The UK Civil Aviation Authority publishes periodic update documents following ongoing research into aircraft noise.

Noise Abatement Management Plan

Massport's noise abatement goals are achieved through the implementation of multiple elements. **Table 6-16** lists these goals and the associated plan elements and reports on progress toward achieving these goals.

Table 6-16 Noise Abatement Management Plan

Noise Abatement Goal	Plan Elements	2020/2021 Progress Report
Limit total aircraft noise	Limit on Cumulative Noise Index (CNI)	The CNI value for 2020 was 150.3 EPNdB and for 2021 was 151.5 EPNdB, which is well below the cap of 156.5 EPNdB.
	Stage 3 percentage Requirement in Noise Rules	In 2020 and 2021, 100 percent of Logan Airport's total commercial jet traffic satisfied Stage 3 noise criteria or better. The newest Stage 5 category comprised about 29 percent of these operations for both years.

46 Federal Aviation Administration. Neighborhood Environmental Survey. https://www.faa.gov/regulations_policies/policy_guidance/noise/survey.

47 Ascent. Pilot Study on Aircraft Noise and Sleep Disturbance. https://ascent.aero/project/noise-exposure-response-sleep-disturbance/.

Table 6-16 Noise Abatement Management Plan (Continued)

Noise Abatement Goal	Plan Elements	2020/2021 Progress Report
Mitigate noise impacts	Residential Sound Insulation Program (RSIP)	No additional dwelling units were sound insulated in 2020 or 2021, leaving the total of treated dwelling units at 11,515 since the start of the program in 1986, with over $170 million invested. See Appendix H, *Noise Abatement,* for additional details. In 2021, Massport updated its RSIP Noise Exposure Map contours and submitted an aviation environmental design tool (AEDT) -derived noise exposure map to the Federal Aviation Administration (FAA) to restart the RSIP program.
	School Sound Insulation Program	Thirty-six eligible schools have been sound insulated since this program began.
	Noise Abatement Arrival and Departure Procedures	Flight track monitoring and data analysis were used to verify adherence to noise abatement flight procedures. See Appendix H, *Noise Abatement,* for data from the 2020 and 2021 Monitoring Reports.
	Preferential Runway Advisory System (PRAS) Runway End Use Goals	Massport continues to report on effective runway use and compare the results to PRAS goals despite that program no longer being in effect.
	Runway Restrictions	Noise-based use restrictions 24 hours per day on departures from Runway 4L and arrivals on Runway 22R were continued.
	Reduced-Engine Taxiing	Voluntary use of reduced-engine taxiing is encouraged when appropriate and safe.
Continue to Improve the Noise Monitoring System	Evaluate current system and update system as needed	Beginning in 2019, L3Harris began upgrading the system and has upgraded 29 noise monitors.
Minimize nighttime noise	Nighttime Stage 2 Aircraft Prohibition	With the FAA's ban on all Stage 2 operations after December 31, 2015, this prohibition is no longer necessary.
	Nighttime Runway Restrictions	Prohibitions on use of Runway 4L for departures and Runway 22R for arrivals between 11:00 PM and 6:00 AM were continued.
	Maximization of Late-Night Over-Water Operation	Efforts to maximize late-night over-water operations were continued. Use of Runway 15R for departures and Runway 33L for arrivals continued.
Minimize nighttime noise (continued)	Nighttime Engine Run-up and auxiliary power unit (APU) Restrictions	Restriction on nighttime engine run-ups and use of APUs was continued.
Address/respond to noise issues and complaints	Noise Office	Massport's Noise Office was established in 1977. Noise Office staff are involved in all elements of Logan Airport's noise abatement efforts.
	Noise Complaint Line and website	Massport continued operation of its Noise Complaint Line, (617) 561-3333 and website (https://www.massport.com/logan-airport/about-logan/noise-abatement/complaints/).

Table 6-16 Noise Abatement Management Plan (Continued)

Noise Abatement Goal	Plan Elements	2020/2021 Progress Report
	Special Studies	Massport continued to provide technical assistance and analysis using noise monitoring system to support the FAA and others in monitoring jet departure tracks from Runway 27 and Runway 33L. Massport and the FAA completed an Area Navigation (RNAV) evaluation project in 2021 designed to identify ways to reduce noise from the RNAV procedure (which concentrates flights). Massport is working with the Aviation Sustainability Center (ASCENT) on two research project concerning aircraft noise and flight procedures. Massport continues to support research at the federal level including Boston University/Tufts University FAA ASCENT research.

Source: Massport, 2022.

This Page Intentionally Left Blank.

7

Air Quality/Emissions Reduction

This Environmental Data Report (EDR) focuses on calendar years 2020 and 2021. Beginning in March 2020, flights in and out of Logan Airport were dramatically reduced and passenger levels dropped due to the COVID-19 pandemic. As a result, the number of aircraft operations in 2020 decreased by approximately 52 percent and the number of passengers in 2020 decreased by approximately 70 percent compared to 2019 levels. While the number of operations and passengers increased in 2021 when compared to 2020 levels, the number of operations and passengers in 2021 remained below pre-pandemic (2019) levels (approximately 38 and 47 percent less). However, it is expected that demand and airline capacity will continue to recover as the U.S. transitions out of the pandemic phase.

The reduction in aircraft operations and passenger-related ground access trips in 2020 and 2021 compared to 2019 resulted in lower emissions of air pollutants for which there are National Ambient Air Quality Standards (NAAQS), as well as lower emissions of the precursors to the NAAQS-regulated pollutants, and greenhouse gas (GHG) emissions, than emission levels estimated for Logan Airport since 1999. Changes in the 2020 and 2021 emissions are also a result of changes in the aircraft fleet operating at Logan Airport and emission reduction initiatives by Massport that have reduced emissions. Furthermore, changes in aircraft fleet are partially due to the pandemic, which has resulted in a restructuring of airline fleets and expedited retirement of older, lower, and less fuel-efficient aircraft.

Massport remains committed to implementing emissions reduction strategies identified in previous EDR publications, and those documented in this chapter and in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*.

In 2021, Massport prepared the *Net Zero Roadmap by 2031*, the goal of which is to strive to reach net zero GHG emissions by 2031, Massport's 75th anniversary. The *2022 Environmental Status & Planning Report* (ESPR) will report on the implementation of that program.

Key Findings for 2020 and 2021

- Massport's air quality management strategy for Boston Logan International Airport (Logan Airport or the Airport) focuses on decreasing emissions from Airport-related sources. Key Massport initiatives to reduce air emissions from Airport operations include:
  - Replacement of existing gas- and diesel-powered ground service equipment (GSE) with electric equivalents, where commercially available,
  - Commitment to the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED®) green building standards and other sustainability standards,
  - Investment in renewable energy installations on-Airport (solar/wind),
  - Use of clean-fuel shuttle buses,
  - Implementation of strategies to promote high occupancy vehicle (HOV) use and ground transportation improvements, and
  - Development and implementation of energy efficiency, emission reduction, and clean energy strategies outlined in Massport's *Net Zero Roadmap by 2031*.[1]
- Total modeled emissions of volatile organic compounds (VOCs), oxides of nitrogen (NO_X), carbon monoxide (CO), and particulate matter ($PM_{10}/PM_{2.5}$) decreased from 2019 to 2020 by about 58 percent, 54 percent, 59 percent, and 47 percent, respectively. The 2021 total modeled emissions of VOC, NO_X, CO, and $PM_{10}/PM_{2.5}$ decreased by about 45 percent, 42 percent, 48 percent, and 23 percent, respectively, from 2019 levels. These decreases are primarily attributable to the decrease in passenger activity levels and aircraft operations due to the COVID pandemic.
- Modeled emissions of VOCs, NO_X, CO, and $PM_{10}/PM_{2.5}$ associated with aircraft decreased from 2019 to 2020 due to the COVID pandemic, by approximately 59 percent, 54 percent, 58 percent, and 53 percent, respectively. While there are model version differences between 2019 and 2020, causing variances in emissions between those years, overall aircraft emissions decreased from 2019 to 2020 for all pollutants predominantly due to the decrease in passenger air travel demand, and thus fewer operations, due to the COVID pandemic. Modeled emissions of VOCs, NO_X, CO, and $PM_{10}/PM_{2.5}$ associated with aircraft decreased from 2019 to 2021 by approximately 48 percent, 42 percent, 49 percent, and 44 percent, respectively.
- Modeled emissions of VOCs, NO_X, CO, and $PM_{10}/PM_{2.5}$ associated with GSE declined from 2019 to 2020 by approximately 40 percent, 48 percent, 36 percent, and 50 percent, respectively. From 2019 to 2021, GSE-related emissions of VOCs, NO_X, CO, and $PM_{10}/PM_{2.5}$ decreased by approximately 22 percent, 39 percent, 20 percent, and 39 percent, respectively, due to the decrease in aircraft operations in the two years, which in turn required reduced use of GSE and aircraft auxiliary power units (APUs).
- Modeled emissions of VOCs, NO_X, CO, and $PM_{10}/PM_{2.5}$ associated with motor vehicles, many of which Massport has influence on, have declined from 2019 to 2020 by approximately 76 percent, 93 percent, 79 percent, and 27 percent, respectively. Notably, the small decrease in $PM_{10}/PM_{2.5}$ emissions from 2019 to 2020, despite the substantial reduction in passenger activity levels, is mainly due to the model variances between the two different model versions of MOtor Vehicle Emission Simulator (MOVES) (MOVES2014b versus MOVES3.0.3) used between the two analysis years. Furthermore, from 2019 to 2021, emissions of VOCs, NO_X, and CO decreased by approximately 50 percent, 84 percent, and 57 percent, respectively. On the other hand, $PM_{10}/PM_{2.5}$ emissions increased by approximately 57 percent. Again, this is mainly due to the model variances between the two different model versions of MOVES used between the two analysis years. These variances and their effect on $PM_{10}/PM_{2.5}$ emissions are further discussed in the chapter.
- Greenhouse gas (GHG) emissions associated with Logan Airport in 2020 and 2021 are less than 1 percent of the most recent statewide total emissions estimates.[2] Total Logan Airport GHG emissions (i.e., Scopes 1, 2, and 3) decreased from 2019 to 2020 by about 60 percent and decreased by about 51 percent from 2019 to 2021.

1 Massport. *Net Zero Roadmap by 2031*. https://www.massport.com/massport/about-massport/roadmap-to-net-zero/.

2 The 2020 and 2021 percentages are based on relative amount of Airport total of direct emissions to 2019 statewide totals. 2019 statewide totals are derived from MassDEP's 2nd Addendum to the Statewide Greenhouse Gas Emissions Level: 1990 Baseline Update (June 2022) report, https://www.mass.gov/doc/2nd-addendum-to-statewide-ghg-level-proposed-1990-baseline-update-june-2022/download.

Introduction

Massport is a national leader in studying, tracking, and reporting on the air quality environment of Logan Airport, and in implementing measures to reduce emissions. Recognized as early as 2008 with an environmental award for Logan Airport's Emissions Reduction Program, Massport annually prepares an inventory of Airport-related emissions of the following U.S. Environmental Protection Agency (EPA) criteria air pollutants (and their precursors)—carbon monoxide (CO), nitrogen dioxide (NO_2), particulate matter ($PM_{10}/PM_{2.5}$),[3] and volatile organic compounds (VOCs).[4] Emissions of lead (Pb) and sulfur dioxide (SO_2) are not computed, as Logan Airport emission sources are very small generators of these two EPA criteria air pollutants. An annual inventory of GHGs is also prepared.

This chapter describes air quality emissions at Logan Airport during the 2020 and 2021 period and compares them to prior year inventories. When compared to previous inventories, the decrease in CO, oxides of nitrogen (NO_x), VOC, and $PM_{10}/PM_{2.5}$ air emissions in 2020 and 2021 are well within expected values given the corresponding decrease in aircraft operations and passenger activity levels as a result of the COVID-19 pandemic. To a degree, the reduction in emissions is also due to Massport's efforts.

Because Massport does not have direct control over aircraft operations, aircraft fleet types, or ground service equipment (GSE) fleet choices by the airlines, Massport continues to focus on sources that it directly controls and work with third party entities such as the airlines to reduce their emissions. Massport's efforts include:

- Implementing a Net Zero program aimed at reducing Massport's emission by 2031 and enabling further reductions by Logan Airport tenants and airline partners.
- Providing pre-conditioned air (PCA) and 400-Hertz (Hz) power at all aircraft contact gates to reduce aircraft idling and auxiliary power unit (APU) use.
- Facilitating the replacement of gas- and diesel-powered GSE with electric equivalents (eGSE), where commercially available.
- Encouraging single-engine taxiing procedures by the airlines to reduce both noise and air emissions.
- Installing electric vehicle (EV) charging stations available for public use.
- Replacing older Massport fleet vehicles with alternative fuel and or electric vehicles (AFV/EVs).
- Installing airside charging stations to support the use of battery-powered eGSE such as aircraft tugs and belt loaders.

One central element of Massport's emissions reduction initiative is a comprehensive strategy to diversify and enhance ground transportation options for passengers and employees and to efficiently move vehicles while they are on-Airport. Massport is committed to reducing vehicle miles traveled (VMT) and associated emissions on Massport-controlled ground transport facilities (such as roadways and curbsides, parking facilities, and vehicle staging areas), as well as reducing VMT by Airport users traveling to and from the Airport.

In addition to reducing VMT, on-Airport vehicle circulation improvements are underway. Massport's ground transportation strategy is designed to help reduce automobile-related air emissions and improve air quality by providing a broad range of high occupancy vehicle (HOV), public transit, and shared-ride options for travel to and

3 PM emissions are emissions of PM with a diameter that is 10 micrometers and smaller (PM_{10}) which is inclusive of particulate matter with a diameter that is 2.5 micrometers and smaller ($PM_{2.5}$).

4 Emissions of NO_2 are conservatively estimated by preparing emission estimates of total nitrogen oxides (NO_X).

from Logan Airport. The strategy also aims to reduce drop-off/pick-up modes by providing parking on-Airport for passengers choosing to drive or with limited HOV options. Continuing improvements to support HOV include evaluating new Logan Express service offerings, investing in existing Logan Express sites (e.g., increasing parking capacity, increasing service frequency), implementing priority security lines for Logan Express riders, reducing urban Logan Express fares, and providing free Massachusetts Bay Transportation Authority (MBTA) Silver Line outbound boarding (from Logan Airport) and free Back Bay Logan Express outbound fares. Massport continues to carefully review both on and off-Airport activity levels and will adjust its ground access programs to align with ridership levels.

By enhancing the Airport roadway system, vehicles can circulate more efficiently, resulting in lower overall emissions. Chapter 5, *Ground Access to and from Logan Airport,* provides detailed information on Massport's ground access and parking management strategy.

Massport also supports the use of alternative fuels by taxis; provides an on-Airport public-use, compressed natural gas (CNG) station; provides electric plug-ins for eGSE; and installs and maintains 400-Hz power and PCA at all airplanes contact gates to help reduce aircraft emissions. Currently, there are 12 charging stations installed at Logan Airport's RideApp (formerly known as transportation network companies [TNC]), black car limousine, and taxi sites. Further, Massport continues to invest in energy efficiency measures, such as the installation of solar panels and constructing new and renovated facilities to meet the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED®) standards. Together, these improvements help to reduce emissions associated with Logan Airport.

In addition to Massport's initiatives, airlines operating at Logan Airport are implementing strategies to reduce emissions. For example, jetBlue Airways has achieved carbon-neutral flying on all its domestic services through their fleet of aircraft and carbon offsets. jetBlue Airways announced an accelerated transition to sustainable aviation fuel (SAF) with a target to convert 10 percent of the airline's total fuel usage to SAF on a blended basis by 2030.[5]

5 jetBlue, "jetBlue Accelerates Transition to Sustainable Aviation Fuel (SAF) With Plans for the Largest-Ever Supply of SAF in New York Airports for a Commercial Airline," September 29, 2021. http://mediaroom.jetblue.com/investor-relations/press-releases/2021/09-29-2021-132310033.

Regulatory Framework

The federal Clean Air Act (CAA), NAAQS, and similar state laws govern air quality issues in Massachusetts. The NAAQS and the Massachusetts State Implementation Plan (SIP), a document that describes measures to attain and maintain compliance with the NAAQS, regulate air quality in the Boston Metropolitan Area and other areas of the state. These regulations are discussed in the following sections.

National Ambient Air Quality Standards (NAAQS)

The EPA established NAAQS for a group of criteria air pollutants to protect public health, the environment, and quality of life from the detrimental effects of air pollution. There are NAAQS for six "criteria air pollutants," CO, Pb, NO_2, ozone (O_3), PM, and SO_2. The primary NAAQS for these criteria air pollutants, established to protect human health, and the secondary standards that are established to protect human welfare, are provided in **Table 7-1**. Notably, there are no current state or federal air quality standards for outdoor levels of ultrafine particles (UFPs). Regardless, Massport is actively tracking the research and regulatory status of this pollutant and will comply with future UFP standards if such standards are promulgated by the EPA.

Logan Airport is in the Boston Metropolitan Area. In accordance with the CAA, all areas within Massachusetts are designated as either attainment, nonattainment, or attainment/maintenance with respect to the NAAQS.[6,7] The regulatory designations for the Boston Metropolitan Area as of the publication of this EDR are listed in **Table 7-2**. As shown, the area is designated to be in attainment of all pollutants, except for CO, which it is designated to be in attainment/maintenance. Notably, there has not been a measured exceedance of the CO standards since 1995 (27 years) and, in 2018, the Massachusetts Department of Environmental Protection (MassDEP) published a *Second 10-Year Limited Maintenance Plan* for CO that details the agency's plans to maintain levels of CO below the standards.[8]

6 EPA, *Nonattainment Areas for Criteria Pollutants (Green Book)*, accessed on September 19, 2022, and available at https://www.epa.gov/green-book.

7 An area with air quality levels that meet or are below the NAAQS is designated as attainment; an area with air quality levels that are above the NAAQS is designated as nonattainment; and an area that has attained the NAAQS but remains subject to certain requirements of the CAA is designated as maintenance. An area may also be designated as unclassifiable when there is lack of data to form a basis for determining attainment status. Nonattainment areas can be further classified as extreme, severe, serious, moderate, and marginal by the degree of non-compliance with the NAAQS.

8 Commonwealth of Massachusetts, Massachusetts Department of Environmental Planning, Revision to the Massachusetts State Implementation Plan for Carbon Monoxide, *Second 10-Year Limited Maintenance Plan for the Boston Metropolitan Area*, Lowell, Springfield, Waltham, and Worcester. February 9, 2018.

Table 7-1 National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary/ Secondary	Averaging Time	Standard		Notes
			ppm	µg/m³	
Carbon Monoxide (CO)	Primary	8 hour	9	10,000	Not to be exceeded more than once per year.
		1 hour	35	40,000	
Lead (Pb)	Primary and Secondary	Rolling 3-Month Average[1]	—	0.15	Not to be exceeded.
Nitrogen Dioxide (NO_2)	Primary	1 hour	0.100	188	The 98th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
	Primary and Secondary	1 year	0.053	100	Annual mean.
Ozone (O_3)	Primary and Secondary	8 hour[2]	0.070	—	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years.
Particulate Matter with a diameter ≤10 µm (PM_{10})	Primary and Secondary	24 hour	—	150	Not to be exceeded more than once per year on average over 3 years.
Particulate Matter with a diameter ≤2.5 µm ($PM_{2.5}$)	Primary and Secondary	24 hour	—	35	The 98th percentile, averaged over 3 years.
	Primary	1 year	—	12	The annual mean, averaged over 3 years.
	Secondary	1 year	—	15	The annual mean, averaged over 3 years.
Sulfur Dioxide (SO_2)	Primary	1 hour[3]	0.075	196	The 99th percentile of 1-hour daily maximum concentrations, averaged over 3 years.
	Secondary	3 hour	0.5	1,300	Not to be exceeded more than once per year.

Source: U.S. Environmental Protection Agency (EPA), "NAAQS Table," updated April 5, 2022 (https://www.epa.gov/criteria-air-pollutants/naaqs-table).

Notes: There is no NAAQS for NO_X; µm – micrometers; µg/m³ – micrograms per cubic meter; and ppm – parts per million.

1 In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m³ as a calendar quarter average) also remain in effect.

2 Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standard additionally remains in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.

3 The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) remain in effect in certain areas: (1) any area for which it is not yet one year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 Code of Federal Regulations [CFR] 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.

Table 7-2 Attainment/Maintenance/Nonattainment Designations for the Boston Metropolitan Area

Pollutant	Designation
Ozone (8-hour, 2008 Standard)	Attainment
Ozone (8-hour, 2015 Standard)	Attainment
Carbon Monoxide (CO)	Attainment/Maintenance[1]
Nitrogen Dioxides (NO_2)	Attainment
Particulate Matter (PM_{10})	Attainment
Particulate Matter ($PM_{2.5}$)	Attainment
Sulfur Dioxide (SO_2)	Attainment
Lead (Pb)	Attainment

Source: U.S. Environmental Protection Agency (EPA), "Nonattainment Areas for Criteria Pollutants (Green Book)," updated August 31, 2022, https://www.epa.gov/green-book.

1 The Boston Metropolitan Area was redesignated to attainment/maintenance for CO on April 1, 1996.

Historically, the Boston Metropolitan Area, as well as other areas of Massachusetts, was designated nonattainment for O_3 standards that were promulgated in 1979 and 1997 and were subsequently revoked.[9] Due to the requirements of the CAA, MassDEP remains obligated to enforce SIP elements that address O_3. The current O_3 standard for which the area is designated attainment was promulgated in 2015. The 2015 O_3 NAAQS is a revision to a 2008 O_3 NAAQS. The 2015 revision strengthened (i.e., lowered) the standard by which areas would be designated attainment or nonattainment. From the time that the 2008 NAAQS was promulgated, there have been no exceedances of either NAAQS.[10]

While the Boston Metropolitan Area is designated attainment for O_3, the entire state of Massachusetts, along with 10 other states and a Consolidated Metropolitan Statistical Area that includes the District of Columbia and northern Virginia, comprise an Ozone Transport Region (OTR).[11] Because Massachusetts is in the OTR, the state is required to submit a SIP to the EPA and provide a certain level of controls on the sources that emit the pollutants that form O_3, even though the area is designated attainment for the pollutant. Within the Boston Metropolitan Area, major new or modified sources must comply with Reasonably Available Control Technology (RACT) requirements of the SIP to lower emissions of the O_3-forming pollutants (i.e., NO_x and VOC).

9 The 1979 standard was revoked on June 15, 2005 (https://www.epa.gov/green-book/designation-and-naaqs-information-related-1-hour-ozone-1979-standard-naaqs-revoked), and the 1997 standard was revoked on April 6, 2015 (https://www.epa.gov/green-book/designation-and-naaqs-information-related-8-hour-ozone-1997-standard-naaqs-revoked).

10 The 2008 O_3 NAAQS was promulgated by the EPA on May 12, 2012 (Federal Register, Vol 77, No. 98, Page 30160).

11 Ozone can travel with the wind over long distances, creating air quality problems far downwind of pollution sources and can be transported across state borders. Therefore, the Ozone Transport Commission (OTC), which is a multi-state organization, was created under the CAA. The OTC is responsible for advising EPA on transport issues and for developing and implementing regional solutions to the ground-level ozone problem in the Northeast and Mid-Atlantic regions known as the OTR. The OTR encompasses 11 states, including Massachusetts. The CAA sets out specific requirements for the OTR states. These requirements entail submitting a SIP and installing a certain level of controls for the pollutants that form ozone (VOC and NO_X), even if they meet the ozone standards.

Massachusetts State Implementation Plans (SIPs)

The SIPs prepared for Massachusetts detail the State's regulatory plans for maintaining levels of CO and O_3 below the NAAQS. The SIPs that are applicable to the Boston Metropolitan Area are listed in **Table 7-3**. Included in the SIPs is a measure to control the growth of parking spaces which was meant to decrease the number of VMT in the South Boston neighborhood of Boston. The number of commercial and employee parking spaces allowed at Logan Airport is regulated by the Logan Airport Parking Freeze (310 Code of Massachusetts Regulations 7.30), which is an element of the Massachusetts SIP under the CAA (42 U.S.C. §7401 et seq. [1970]).

The intent of the Logan Airport Parking Freeze is to reduce air emissions by shifting air passengers to travel modes that require fewer vehicle trips. However, survey data since the 1970s has consistently shown that constrained parking has the unintended consequence of shifting air passengers to travel modes with higher numbers of vehicle trips, despite Massport's extensive efforts to provide and encourage the use of HOV travel modes. An amendment to increase the Logan Airport Parking Freeze by 5,000 on-Airport commercial parking spaces was finalized on March 6, 2018, and effective on April 5, 2018. For additional information, see Chapter 5, *Ground Access to and from Logan Airport*.

Logan Airport Air Quality Permits for Stationary Sources of Emissions

Massport received a Title V Air Quality Operating Permit for Logan Airport in September 2004, and the most recent renewal was issued in July 2015. At the time of this filing, Massport is in the process of renewing its Title V Operating permit.[12] This permit covers Massport-operated stationary sources including the Central Heating and Cooling Plant, snow melters, fuel dispensers, boilers, emergency generators, and fuel storage tanks.

12 Minor Modification (Application) No. MBR-95-OPP-094RM.

Table 7-3 State Implementation Plans (SIPs) for the Boston Metropolitan Area

Standard	Title	Status	Comments
Carbon Monoxide (CO)	Maintenance Plan	Published February 2018	This second 10-year Maintenance Plan is required for any area that was formerly designated as nonattainment to show that it will not regress to a nonattainment status. The current maintenance plan meets the requirements of Section 175A of the CAA and conforms to EPA guidance for CO maintenance plans.[1]
Ozone (O_3)	2008 SIP	Certified February 2018	In February 2018, MassDEP's transport SIP was certified. This Certification fulfilled the interstate transport requirements in Section 110(a)(2)(D)(i) of the CAA and completed MassDEP's Infrastructure SIP Certification in accordance with Sections 110(a)(1) and (2) of the CAA for the 2008 O_3 NAAQS.[2]
Ozone (O_3)	2015 SIP	Certified September 2018	In October 2015, EPA lowered (i.e., made stricter) the NAAQS for O_3. In September 2018, MassDEP's infrastructure SIP was certified. This certification fulfilled the infrastructure requirements of CAA Sections 110(a)(1) and (2), as well as interstate transport requirements in Section 110(a)(2)(D)(i).[3]
Ozone (O_3)	2008 and 2015 SIP	Published October 2018	MassDEP prepared this revision to the Massachusetts SIP to address RACT requirements for the 2008 and 2015 8-hour O_3 NAAQS. For certain source categories, MassDEP is submitting regulations that establish new or more stringent RACT controls. For other source categories, MassDEP is certifying that previously adopted RACT regulations and controls represent RACT for implementing the 2008 and 2015 O_3 NAAQS.[4]

Source: Commonwealth of Massachusetts, Massachusetts Department of Environmental Protection, "Massachusetts State Implementation Plans (SIPs)," 2022, https://www.mass.gov/lists/massachusetts-state-implementation-plans-sips#ozone-sip-.

Notes: The number of commercial and employee parking spaces allowed at Logan Airport is regulated by the Logan Airport Parking Freeze (310 Code of Massachusetts Regulations 7.30 and 40 Code of Federal Regulations 52.1120), which is an element of the State Implementation Plan (SIP) under the federal Clean Air Act (CAA).
CAA – Clean Air Act, EPA – Environmental Protection Agency, MassDEP – Massachusetts Department of Environmental Protection, CO – Carbon Monoxide, O_3 – Ozone, SIP – State Implementation Plan, NAAQS – National Ambient Air Quality Standards, and RACT – Reasonably Available Control Technology.

1 Commonwealth of Massachusetts, Massachusetts Department of Environmental Protection, *Second 10-Year Limited Maintenance Plan for the Boston Metropolitan Area, Lowell, Springfield, Waltham, and Worcester*, February 9, 2018.

2 Commonwealth of Massachusetts, Massachusetts Department of Environmental Protection, *Certification of Adequacy of the Massachusetts State Implementation Plan with Clean Air Act Section 110(a)(2)(D)(i) Interstate Air Pollution Transport Requirements for the 2008 Ozone National Ambient Air Quality Standards*, February 9, 2018.

3 Commonwealth of Massachusetts, Massachusetts Department of Environmental Protection, *Certification of Adequacy of the Massachusetts State Implementation Plan Regarding Clean Air Act Sections 110(a)(1) and (2) for the 2015 Ozone National Ambient Air Quality Standards*, September 27, 2018.

4 Commonwealth of Massachusetts, Massachusetts Department of Environmental Protection, *Massachusetts Reasonably Available Control Technology State Implementation Plan Revision For the 2008 and 2015 Ozone National Ambient Air Quality Standards*, October 18, 2018.

Assessment Methodology

For the *2020/2021 EDR*, EPA criteria air pollutant emissions (and criteria air pollutant precursor emissions) including CO, NO_X, PM, and VOCs were analyzed for aircraft-related sources (i.e., aircraft engines), GSE (including APUs), motor vehicles, and an "other" category that includes a variety of stationary sources and fuel storage and handling facilities. Emissions of criteria air pollutants/pollutant precursors were estimated based on input data such as activity levels or material throughput rates (e.g., fuel usage, VMT, electrical consumption, etc.) that were applied to appropriate emission factors (e.g., grams per VMT).

Estimates of $PM_{10}/PM_{2.5}$ emissions associated with Logan Airport activities were first reported in the *2005 EDR* in response to the availability of the Federal Aviation Administration's (FAA's) First Order Approximation (FOA) method for computing aircraft $PM_{10}/PM_{2.5}$ emissions. $PM_{10}/PM_{2.5}$emissions are now routinely reported in the EDRs and ESPRs, including this *2020/2021 EDR*.

Estimates of primary GHGs associated with Airport operations were also prepared. The primary GHGs include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). The results of the *2020/2021 EDR* are reported in units of metric tons (MT) of CO_2 equivalents (CO_2e) based on the appropriate Global Warming Potentials (GWPs). GHG emissions are calculated in much the same way as criteria air pollutants/pollutant precursors. This includes the use of input data such as activity levels or material throughput rates (fuel usage, VMT, electrical consumption, etc.) that are applied to appropriate emission factors (e.g., grams of CO_2 per gallon of fuel). Again, these input data were either based on Massport records or data derived from the models. The GWPs and emission factors used to prepare the GHG estimates were obtained from the Intergovernmental Panel on Climate Change (IPCC) and the EPA, respectively.

Consistent with prior EDRs and ESPRs, the 2020 and 2021 GHG assessments include aircraft emissions for all operational modes up to 3,000 feet (referred to as a landing and takeoff (LTO) cycle). GHG emissions associated with GSE, motor vehicles, a variety of stationary sources, and electricity usage were also included following the guidance issued by the Transportation Research Board's (TRB) Airport Cooperative Research Program (ACRP) Report 11: *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories*.[13] Additionally, the 2020 and 2021 GHG emissions were assessed following the guidance of the Airports Council International (ACI) Airport Carbon Accreditation (ACA) Program.[14]

Massport has direct ownership or control over a small percentage of Logan Airport-related GHG emissions (22.7 percent in 2020 and 18.3 percent in 2021) and their sources (mostly limited to Massport fleet vehicles, stationary sources, and electrical consumption within Massport buildings). As with most commercial service airports, the majority of the GHG emission sources are owned, controlled, or generated by the airlines, other airport tenants, and the general public (motor vehicles).

13 National Academies of Sciences, Engineering, and Medicine 2009, Transportation Research Board, Airport Cooperative Research Program, Report 11: *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories*, 2009, Washington, D.C.: The National Academies Press, https://nap.nationalacademies.org/catalog/14225/guidebook-on-preparing-airport-greenhouse-gas-emissions-inventories.

14 ACA, https://aci-lac.aero/airport-carbon-accreditation/.

Massport uses the FAA's Aviation Environmental Design Tool (AEDT)[15] for air quality modeling of aircraft-related emissions. AEDT replaced the FAA's legacy Emissions and Dispersion Modeling System (EDMS) tool in 2015. The AEDT model was used for the first time for the emission estimates reported in the *2016 EDR*. Motor vehicle emission factors were obtained from EPA's latest approved version of Motor Vehicle Emission Simulator (MOVES, Version 3.0.3). The following describes in more detail the air quality models that were used to prepare the emission estimates (i.e., AEDT and MOVES).

FAA Aviation Environmental Design Tool (AEDT)

The AEDT noise and air quality model was released in 2015 and is FAA's approved computer model for calculating emissions from aircraft-related sources. As discussed in *Chapter 6, Noise Abatement*, AEDT is also designed to assess airport noise. The AEDT model was developed to incorporate the most up-to-date and best-available science. The latest version of AEDT at the time of the *2020/2021 EDR* emission estimates was AEDT 3d, which was released in March of 2021.

AEDT 3d introduced new features, improvements, and updates from the previous model version 3c re-release used in the *2018/2019 EDR*. The model changes that may affect the results of the 2020/2021 air quality analyses from prior years include:[16]

- Re-implementation of the Speciated Organic Gases (SOG) calculation.
- Updates to $PM_{10}/PM_{2.5}$ calculations, including the use of measured non-volatile particulate matter (nvPM) from the International Civil Aviation Organization (ICAO) Emissions Databank and revised methods for estimating volatile and non-volatile PM.
- Update of altitude and speed labels in AEDT's graphical user interface (GUI).
- Performance model selection contingent on base of aircraft data (BADA) 4 approval status of aircraft.
- Support for fixed-point profiles with BADA 4 performance.
- BADA 4 fuel burn model is only used with BADA 4 performance.
- Airport, fleet, and study database updates, including updated airport-level weather data.

From an air quality perspective, the primary differences between the two model versions (AEDT 3d versus the previous AEDT 3c re-release version) are the updates to the fleet (i.e., aircraft/engine combinations) databases as well as the updates to $PM_{10}/PM_{2.5}$ calculations. As a result of the variances in available aircraft/engine combinations and $PM_{10}/PM_{2.5}$ calculations, the AEDT 3d model results with the 2020 aircraft fleet presented in **Table 7-4** show a slight increase in aircraft emissions of NO_X, and $PM_{10}/PM_{2.5}$ (2.0 percent and 1.6 percent, respectively), and a negligible decrease in VOC and CO (less than one percent for both pollutants) when compared to AEDT 3c. Since its release, FAA continues to enhance the AEDT model by expanding its capabilities, correcting

15 U.S. Department of Transportation (DOT), Federal Aviation Administration, "Aviation Environmental Design Tool (AEDT)," https://aedt.faa.gov/. At the time of the preparation of the *2020/2021 EDR*, AEDT Version 3d (released on March 29, 2021) was the latest version of AEDT.

16 U.S. DOT, Federal Aviation Administration, Aviation Environmental Design Tool, Version 3d, https://aedt.faa.gov/3d_information.aspx.

computational errors, and making it more user-friendly. These improvements are reflected in periodic version releases of the model, which are expected to continue for the foreseeable future.

Table 7-4 shows the differences by pollutant due to the two different versions of AEDT (Version 3c and 3d) and changes in the aircraft fleet mix and number of aircraft operations between 2019, 2020, and 2021. The decrease in all pollutant emissions from 2019 (AEDT 3c) to 2020 (AEDT 3c) is mainly attributable to the differences between aircraft fleet mix and the number of aircraft operations. Despite the changes between the two versions of AEDT, the decrease in all pollutant emissions from 2019 (AEDT 3c) to 2020 (AEDT 3d) is attributable to the differences between aircraft fleet mix between the two years as well as the decrease in aircraft operations by 51.6 percent from 2019 to 2020. The increase in all pollutant emissions between 2021 AEDT 3d versus 2020 AEDT 3d is strictly due to the changes in the numbers of operations and the change in fleet mix. Operations increased by 28.7 percent from 2020 to 2021.

Table 7-4 Aviation Environmental Design Tool (AEDT) 3c and AEDT 3d Aircraft Emissions Inventory Comparison

	Pollutant (kg/day)			
Model	**VOCs**	**NO_X**	**CO**	**$PM_{10}/PM_{2.5}$**
2019 AEDT 3c	771	6,123	7,171	58
2020 AEDT 3c	315	2,777	2,985	27
2020 AEDT 3d	314	2,832	2,979	27
2021 AEDT 3d	399	3,576	3,678	32
% Difference between 2020 AEDT 3c versus 2019 AEDT 3c:	**(59.1%)**	**(54.6%)**	**(58.4%)**	**(53.4%)**
% Difference between 2020 AEDT 3d versus 2019 AEDT 3c:	**(59.2%)**	**(53.7%)**	**(58.5%)**	**(53.1%)**
% Difference between 2020 AEDT 3d versus 2020 AEDT 3c:	**(0.2%)**	**2.0%**	**(0.2%)**	**1.6%**
% Difference between 2021 AEDT 3d versus 2020 AEDT 3d:	**27.1%**	**26.3%**	**23.5%**	**19.1%**

Source: Massport and CMT, 2022.
Notes: Negative numbers/percent reductions are shown in ( ).
Modeled emissions totals are rounded numbers. Percent calculations based on exact numbers.
CO – carbon monoxide; NO_X – oxides of nitrogen; $PM_{10}/PM_{2.5}$ – particulate matter with a diameter that is 10 micrometers and smaller (PM_{10}) which is inclusive of particulate matter with a diameter that is 2.5 micrometers and smaller ($PM_{2.5}$); VOCs – volatile organic compounds.

EPA MOtor Vehicle Emission Simulator (MOVES)

At the time that emission estimates were prepared for the *2020/2021 EDR*, MOVES Version 3.0.3 was the EPA's latest approved computer model for estimating emissions from mobile sources (i.e., on-road motor vehicles and most nonroad equipment).[17] MOVES estimates emissions at the national, county, and project level for criteria air pollutants/precursor pollutants, GHGs, and air toxics. Compared to the previous version (i.e., MOVES2014b), MOVES3.0.3 incorporates the latest data on vehicle populations, travel activity, and emission rates as well as updated fuel supply information at the county level. The model also better accounts for vehicle starts and

17 EPA, "MOVES3: Latest Version of MOtor Vehicle Emission Simulator (MOVES)," updated August 5, 2022, https://www.epa.gov/moves/latest-version-motor-vehicle-emission-simulator-moves.

incorporates the impacts of the Heavy-Duty Greenhouse Gas Phase 2 Rule of which the model year 2021 vehicle and engine performance standards for vehicles such as large pickup trucks, vans, and buses are applicable, and the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule of which the model year 2021 GHG standards for passenger cars and light trucks are applicable.

Additionally, MOVES3.0.3 uses MariaDB as the database server instead of MySQL, which was the database server for the model version of MOVES2014b. According to the EPA release notes, the differences in the two database servers, as well as the updates to the vehicle population, travel activities, and emission rates, result in higher PM_{10}/$PM_{2.5}$ outputs in MOVES3.0.3 than MOVES2014b.[16]

Air Quality Emission Sources

For the analysis, air emissions associated with Logan Airport operations result from aircraft, GSE (including APUs), motor vehicles, and a source category called "other." These are described below, each of which has its own assessment methodology, database, and assumptions.

The following sources of emissions were analyzed in the *2020/2021 EDR*:

- **Aircraft** – Like past years, actual 2020 and 2021 aircraft fleet mixes at Logan Airport were used as input to AEDT. In a few instances where the aircraft/engine type combinations operating at Logan Airport were not available in the AEDT database, substitutions were made based on the closest match of aircraft frame and engine types using professional judgement. **Tables I-4** and **I-5** in Appendix I, *Air Quality/Emissions Reduction,* contain the 2020 and 2021 data, respectively, that were used to populate the different model versions, including the aircraft and engine types, and numbers of LTOs. Following previous methodologies, the Logan Airport aircraft fleet was grouped into four categories: commercial air carriers, commuter aircraft, general aviation (GA), and cargo aircraft.

  According to these data, from 2019 to 2020, total LTOs decreased by 51.6 percent, with air carrier LTOs decreasing by 55.5 percent, commuter LTOs decreasing by 47.5 percent, air cargo LTOs increasing by 35.4 percent, and GA decreasing by 49.3 percent. The decrease in total LTOs is attributable to the COVID pandemic. However, the increase in air cargo LTOs during the pandemic was initially driven by the demand for personal protective equipment (PPE) and medications, and later by challenges in the ocean-shipping supply chain and strong growth in e-commerce sales. Furthermore, total LTO started to increase from 2020 to 2021 by 28.7 percent, with air carrier LTOs increasing by 17.1 percent, commuter LTOs increasing by 51.6 percent, air cargo LTOs increasing by 22.8 percent, and GA decreasing 57.4 percent. This increase is attributable to the recovery in demand for air travel in 2021 from pre-pandemic (2019) levels.

  Updated aircraft taxi/delay times are based on data obtained from the FAA Aviation System Performance Metrics (ASPM) database for years 2020 and 2021.[18] According to this database, the average aircraft taxi/delay times at Logan Airport from 2019 to 2020 decreased from 28.0 minutes to 22.3 minutes or 20.4 percent. Again, this decrease is due to the drop in aircraft operations at Logan Airport during the pandemic. Average aircraft taxi/delay times from 2020 to 2021 did not change and remained steady at

18 U.S. DOT, FAA, ASPM Database, https://aspm.faa.gov/.

22.3 minutes. As previously stated, the pandemic has resulted in a restructuring of airline fleets and expedited retirement of older, lower, and less fuel-efficient aircraft.

- **Ground Service Equipment** – Estimates of GSE emissions (including APUs) were based on the FAA's AEDT emission factors and continue to reflect emission reductions attributable to Massport's AFV Program and the conversion of Massport and/or tenant GSE and fleet vehicles to CNG or electric. Accordingly, GSE emissions factors decreased from 2019 through 2020. Other AEDT input data are based on the updated Logan Airport-specific GSE time-in-mode (TIM) survey conducted in 2017, combined with the most recent GSE fuel use (i.e., gasoline, diesel, liquid petroleum gas, and electric) data from Massport's Vehicle Aerodrome Permit Application Program for Logan Airport as well as AEDT's default GSE types and TIM data.
- **Motor Vehicles** – Motor vehicle emission factors were obtained from EPA's MOVES model (i.e., MOVES3.0.3) combined with MassDEP-recommended motor vehicle fleet mix data, operating conditions, and other Massachusetts-specific input parameters. In general, the emission factors obtained from MOVES3.0.3 decrease as years progress due to improved engine efficiencies. However, these variances in emission factors might not be as noticeable in the 2020/2021 inventory as in prior inventories due to the drastic changes to the passenger activity levels.

  The MOVES input/output files are included in Appendix I, *Air Quality/Emissions Reduction*. In addition, Chapter 5, *Ground Access to and from Logan Airport,* of this *2020/2021 EDR* provides a discussion of the on-Airport VMT data and curbside/parking volumes used for this analysis.
- **Other Sources** – Emissions associated with fuel storage and handling facilities, the Central Heating and Cooling Plant, snow melters, emergency generators, space heaters, and fire training at Logan Airport were based on annual fuel throughput records for 2020 and 2021, combined with appropriate EPA emission factors (for example, compilation of Air Pollution Emission Factors [AP42], manufacturer provided emission factors, or emission factors obtained from NO_X RACT compliance testing). Since 2017, natural gas usage at Logan Airport has increased and No. 2 fuel oil usage has decreased. The increase in natural gas usage is primarily due to the shift to high efficiency natural gas boilers. Notably, in November 2014, Massport converted the Central Heating and Cooling Plant fuel oil system from No. 6 to No. 2 fuel oil, still retaining the ability to burn natural gas. At the end of 2021, Massport was solely using natural gas, which reduces energy use and air emissions while maintaining the ability to use backup fuel oil in the event of a disruption of natural gas service or for maintenance and testing. Massport is planning to upgrade the Central Heating and Cooling Plant at Logan Airport to accommodate the anticipated increase in heating load for the Terminal E expansion. The project will include replacing the existing dual fuel Boiler 3 with a new natural gas fired boiler of approximately the same capacity. Massport is also planning to further reduce the Central Heating and Cooling Plant emissions as part of a *Net Zero Roadmap by 2031* strategy.

Massport undertakes a variety of programs to reduce Airport-related emissions that it does not directly own or control through its support of HOV initiatives, including subsidizing free outbound Silver Line Service from Logan Airport; supporting use of AFVs by airport taxis; providing eGSE charging stations and other initiatives to facilitate the replacement of gas- and diesel-powered GSE with eGSE; and providing 400-Hz power and PCA at all aircraft contact gates. Massport is also collaborating with the Massachusetts Clean Energy Center (MassCEC) to study opportunities to enable conversion of the ride-for-hire fleet (RideApp, Rental Car Taxi and limousine vehicles) that serves Logan Airport to transition to electric vehicles. In early 2022, MassCEC provided a grant to initiate this work and provided funding to enhance Logan's EV charging infrastructure.

Emissions Inventory in 2020 and 2021

This section provides the results of the 2020 and 2021 Logan Airport emissions inventories for the pollutants and/or pollutant precursors VOC, NO_X, CO, and $PM_{10}/PM_{2.5}$ using the AEDT 3d and MOVES3.0.3 models and standard emission factors for stationary sources. Notably, there are no source emission rates for the air pollutant O_3 because it is formed by the interactions between VOCs and NO_X in the presence of sunlight. Emissions of Pb and SO_2 are not computed, as Logan Airport emission sources are very small generators of these two EPA criteria air pollutants.

As stated above, the aircraft emissions inventory was computed based on the actual number of aircraft operations, fleet mix, and operational times-in-mode at the Airport in 2020 and 2021. Similarly, emissions associated with GSE (including APUs), motor vehicles, fuel storage and handling facilities, and a variety of stationary sources (such as steam boilers, snow melters, live-fire training, space heaters, and emergency generators) associated with Logan Airport were also computed based on actual conditions.

As in previous EDRs and ESPRs, the 2020 and 2021 emissions inventories for Logan Airport are used for short-term comparisons to the 2019 inventory results as well as for long-term comparisons to previous EDRs and ESPRs extending back to 1990. Since both 2020 and 2021 activity levels were influenced by the pandemic, most comparisons between 2020 and 2021 are not representative and therefore while those numbers are reported, a more relevant comparison is between 2019 (pre-pandemic) and 2021.

For ease of review, most of the tables and figures that provide the 2020 and 2021 results also show the results for 1990 and 2000 and then annually for 2010 to 2019. In this way, Logan Airport emissions can be compared in both the short- and long-term timeframes and on a common basis.

The change in emissions year-to-year is a function of several variables. These include growth in operations and changes in the aircraft fleet, advancements in aircraft engine technologies, improved airfield efficiencies, and Massport's emission reduction measures such as the GSE replacement initiatives. Another factor involves the continuous evolution of air quality models. An example of the effects of model versions can be seen in the $PM_{10}/PM_{2.5}$ section of this chapter where the results of the motor vehicle-specific $PM_{10}/PM_{2.5}$ inventory are compared to prior year model versions (MOVES2014b versus MOVES3.0.3).

As shown in **Table 7-5,** the 2020 emissions inventory using AEDT 3d/MOVES3.0.3 results in lower emissions of all pollutants in comparison to the 2019 inventory using AEDT 3c/MOVES2014b. The differences in results between the 2020 and 2019 inventories are predominantly due to the decrease in passenger and operational levels due to the COVID pandemic. Results for the 2021 emission inventory are also presented and compared to 2020. The increase in emissions of all pollutants between the 2021 and 2020 inventories are attributable to increases in aircraft operations and VMT.

Table 7-5 Total Emissions Inventory Comparison, 2019, 2020 and 2021

		Pollutant (kg/day)			
Year	**Models**	**VOCs**	**NO_X**	**CO**	**$PM_{10}/PM_{2.5}$**
2019	AEDT 3c and MOVES2014b	1,295	6,440	8,267	92
2020	AEDT 3d and MOVES3.0.3	543	2,984	3,416	49
2021	AEDT 3d and MOVES3.0.3	716	3,756	4,321	71
% Difference 2019 to 2020		**(58.1%)**	**(53.7%)**	**(58.7%)**	**(46.9%)**
% Difference 2020 to 2021		**31.8%**	**25.9%**	**26.5%**	**45.6%**

Source: Massport and CMT, 2022.

Notes: Negative numbers/percentage decreases are shown in ( ).
Modeled emissions totals are rounded numbers. Percent calculations based on exact numbers.
AEDT – Aviation Environmental Design Tool; VOCs – volatile organic compounds; NO_X – oxides of nitrogen; CO – carbon monoxide; $PM_{10}/PM_{2.5}$ – particulate matter with a diameter that is 10 micrometers and smaller (PM_{10}) which is inclusive of particulate matter with a diameter that is 2.5 micrometers and smaller ($PM_{2.5}$).

The following sections compare the air emission results by pollutant (i.e., VOC, NO_X, CO, and $PM_{10}/PM_{2.5}$) and by source (i.e., aircraft, GSE/APUs, motor vehicles, stationary sources, and non-mobile sources) between 2019 and 2020 and between 2020 and 2021.

Volatile Organic Compounds (VOCs)

In 2020 and 2021, total VOC emissions at Logan Airport were 219 tons per year (tpy) (or 543 kilograms per day [kg/day]) and 288 tpy (or 716 kg/day), respectively. The 2020 VOC emissions show a decrease of 58.1 percent from 2019 levels (521 tpy or 1,295 kg/day). The 2021 VOC emissions were 44.7 percent less than 2019 levels.

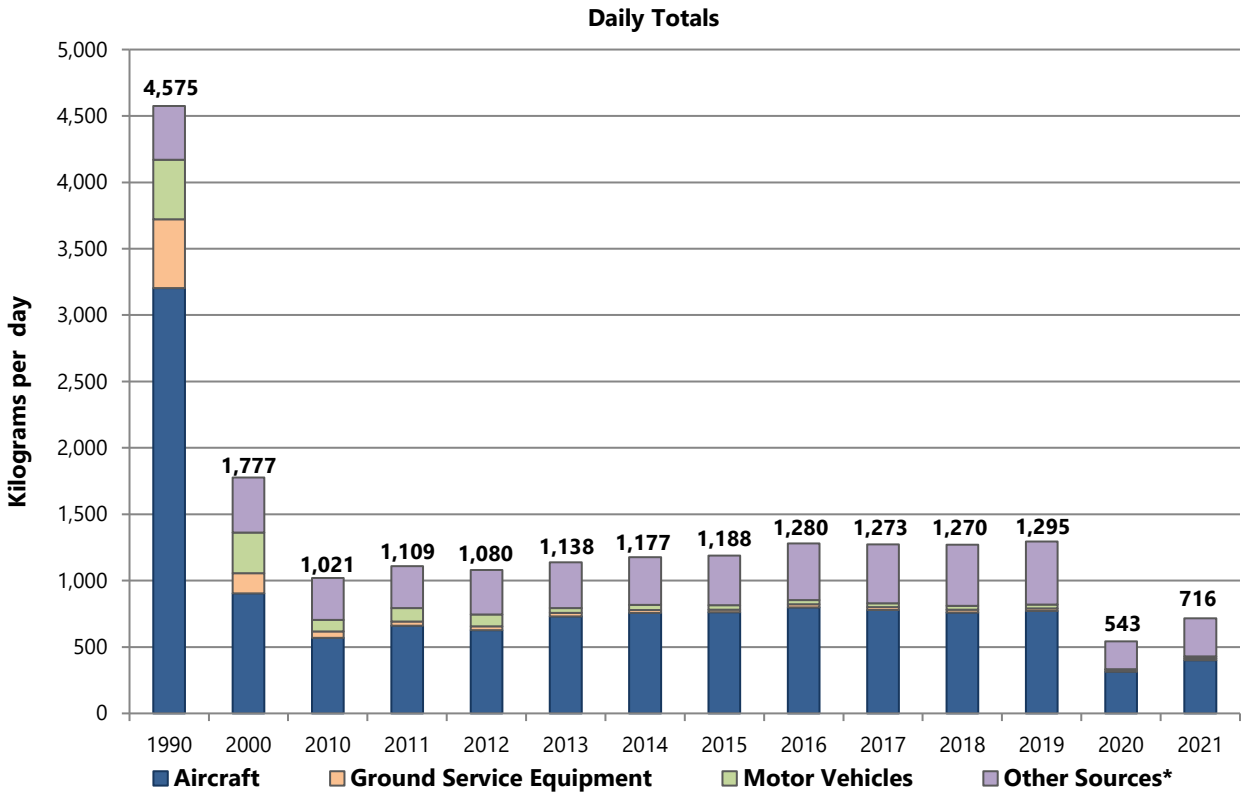
As shown in **Figure 7-1**, the long-term trend for VOC emissions reveals a substantial decrease from 1990 through 2010 (approximately 77 percent). From 2010 to 2019 there has generally been an increase in emissions with fluctuations on an annual basis. As expected, VOC emissions decreased from 2019 to 2020 and then increased from 2020 to 2021. **Figure 7-2** shows the percent breakdown of VOC emissions by source category for 2020 and 2021. **Table 7-6** provides the computed VOC emissions in kg/day for each emission source for 1990, 2000, and 2010 to 2021. Other key findings from this analysis include the following:

- Total aircraft-related VOC emissions decreased by 59.2 percent in 2020 (AEDT 3d) compared with 2019 (AEDT 3c). The decrease in 2020 compared to 2019 was largely due to the decrease in aircraft operations in 2020 due to the pandemic. However, differences in fleet mix between 2019 and 2020 as well as model version differences between AEDT 3d and 3c may also have influenced the emission results. Aircraft-related VOC emissions for 2021 remain 48.2 percent less than 2019 levels.
- GSE-related VOC emissions, including APUs, were 40.0 percent lower in 2020 (AEDT 3d) than in 2019 (AEDT 3c). Again, the differences in emissions from 2019 to 2020 are largely due to the change in aircraft operations between the two analysis years, which subsequently affects the GSE and APU assignments to an aircraft. 2021 GSE-related VOC emissions remain 21.6 percent less than 2019 levels.
- Similarly, VOC emissions from motor vehicles in 2020 decreased 75.6 percent from 2019 levels. 2021 motor vehicle VOC emissions remain 50.4 percent below 2019 levels.

- VOC emissions from stationary and other non-mobile sources (fuel storage/handling, Central Heating and Cooling Plant, snow melter usage, firefighter training, etc.) decreased by 55.9 percent from 2019 to 2020 and 39.8 percent from 2019 to 2021. These changes are attributable to the decrease in travel demand in 2020 due to the pandemic and the recovery of some travel in 2021.

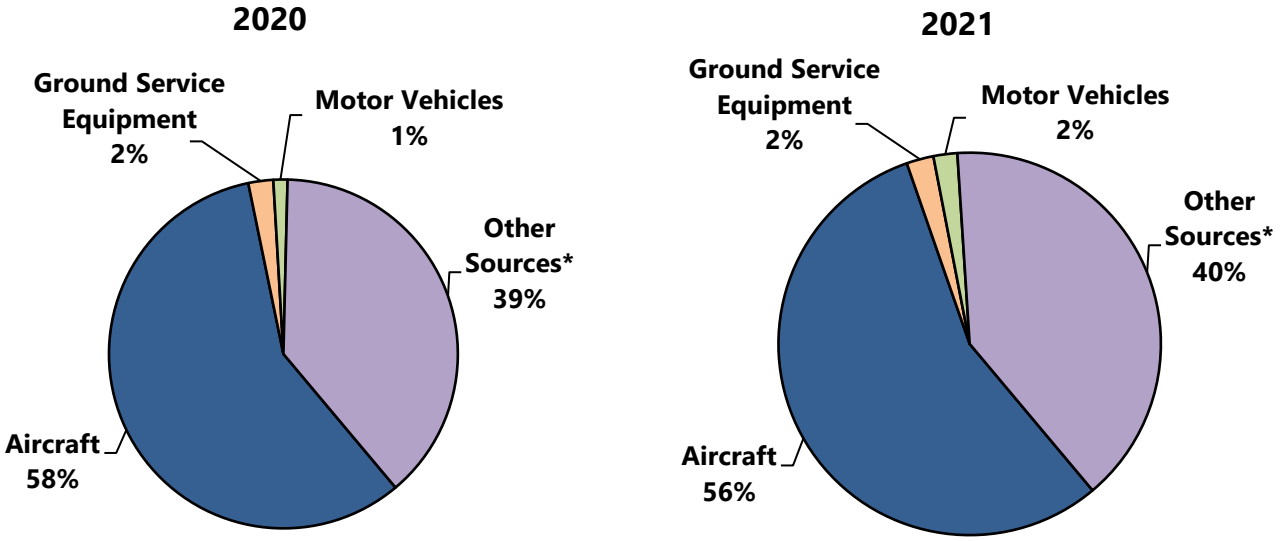
As shown in **Figure 7-2**, aircraft continued to represent the largest source (about 58 percent) of VOC emissions associated with Logan Airport in 2020, followed by other sources (about 39 percent), GSE (about 2 percent), and motor vehicles (about 1 percent). Similarly, in 2021, aircraft represented approximately 56 percent of VOC emissions with other sources, GSE and motor vehicles, representing the remaining approximately 40 percent, 2 percent, and 2 percent, respectively.

Figure 7-1 Modeled Emissions of VOCs at Logan Airport, 1990, 2000, 2010-2021



Source: Massport and CMT, 2022.
Notes: Other sources include miscellaneous sources (i.e., Central Heating and Cooling Plant, snow melter usage, fire training, etc.) and fueling sources. In 2020 and 2021, aircraft-related emissions were calculated using AEDT 3d and motor vehicles were calculated using MOVES3.0.3.

Figure 7-2 Sources of VOC Emissions, 2020 and 2021



Source: Massport and CMT, 2022.
Notes: Other sources include stationary sources (e.g., Central Heating and Cooling Plant, snow melter usage, fire training, etc.) and fuel storage and handling facilities. In 2020 and 2021, aircraft-related emissions were calculated using AEDT 3d and motor vehicles were calculated using MOVES3.0.3.

Table 7-6 Estimated VOC Emissions (in kg/day) at Logan Airport, 1990, 2000, and 2010-2021[1]

Aircraft/GSE Model:	LDMS	EDMS v4.03	EDMS v5.1.2	EDMS v5.1.3			EDMS v5.1.4.1					AEDT Version 2c SP2		AEDT Version 2d	AEDT Version 3c				AEDT Version 3d
Motor Vehicle Model:	**MOBILE 5a**	**MOBILE 6.0**	**MOBILE 6.2.03**				**MOVES 2010b**	**MOVES 2014**		**MOVES 2014a**				**MOVES 2014b**				**MOVES 3.0.3**	
Year:	**1990**	**2000**	**2010**	**2011**	**2012**	**2013**	**2014**		**2015**	**2016**		**2017**		**2018**		**2019**	**2020**		**2021**
Aircraft Sources																			
Air carriers	2,175	514	292	292	305	378	448	447	480	480	491	504	553	516	517	531	531	561	191	190	221
Commuter aircraft	681	140	129	125	110	91	91	91	85	85	87	79	74	65	77	81	89	84	34	35	47
Cargo aircraft	303	207	70	70	69	63	44	44	48	48	47	56	61	50	50	23	23	21	50	51	64
General aviation	44	42	81	81	176	93	149	149	144	144	135	121	110	183	134	110	116	105	40	39	67
Total aircraft sources	**3,203**	**903**	**572**	**568**	**660**	**626**	**732**	**731**	**757**	**757**	**761**	**760**	**798**	**814**	**778**	**745**	**759**	**771**	**315**	**314**	**399**
Ground Service Equipment[2]	**518**	**153**	**49**	**49**	**33**	**30**	**26**	**26**	**23**	**23**	**21**	**24**	**24**	**22**	**22**	**19**	**21**	**21**	**13**	**13**	**16**
Motor Vehicles																					
Ted Williams Tunnel through-traffic[3]	N/A	12	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Parking/ curbside	192	89	20	20	20	18	17	5	3	4	4	3	3	3	3	3	3	3	1	1	1
On-airport vehicles	258	206	68	68	81	70	67	31	16	34	30	28	28	26	26	28	28	26	6	6	13
Total motor vehicle sources	**450**	**307**	**86**	**86**	**101**	**88**	**84**	**36**	**19**	**38**	**34**	**31**	**31**	**29**	**29**	**30**	**30**	**29**	**7**	**7**	**14**

Table 7-6 Estimated VOC Emissions (in kg/day) at Logan Airport, 1990, 2000, and 2010-2021[1] (Continued)

Aircraft/ GSE Model:	LDMS	EDMS v4.03	EDMS v5.1.2	EDMS v5.1.3			EDMS v5.1.4.1					AEDT Version 2c SP2	AEDT Version 2d	AEDT Version 3c			AEDT Version 3d		
Motor Vehicle Model:	**MOBILE 5a**	**MOBILE 6.0**	**MOBILE 6.2.03**				**MOVES 2010b**	**MOVES 2014**		**MOVES 2014a**				**MOVES 2014b**			**MOVES3.0.3**		
Year:	**1990**	**2000**	**2010**	**2011**	**2012**	**2013**		**2014**		**2015**	**2016**	**2017**		**2018**		**2019**	**2020**		**2021**
Other Sources																			
Fuel storage/ handling	400	412	311	311	311	332	340	340	354	354	366	422	422	439	439	455	455	469	205	205	282
Miscellaneous sources[4]	4	2	5	5	4	4	5	5	5	5	6	5	5	5	5	5	5	5	4	4	4
Total other sources	**404**	**414**	**316**	**316**	**315**	**336**	**345**	**345**	**359**	**359**	**372**	**427**	**427**	**444**	**444**	**460**	**460**	**475**	**209**	**209**	**28**
Total Airport Sources	**4,575**	**1,777**	**1,025**	**1,021**	**1,109**	**1,080**	**1,187**	**1,138**	**1,158**	**1,177**	**1,188**	**1,242**	**1,280**	**1,308**	**1,273**	**1,253**	**1,270**	**1,295**	**544**	**543**	**716**

Source: Massport and CMT, 2022.

Notes: Values may reflect rounding.
LDMS – Logan Dispersion Modeling System
EDMS – Emissions and Dispersion Modeling System
AEDT – Aviation Environmental Design Tool
MOVES – MOtor Vehicle Emission Simulator
N/A – not available.
kg/day - kilograms per day. 1 kg/day is equivalent to approximately 0.40234 tons per year (tpy).

1 See Appendix I, *Air Quality/Emissions Reduction,* for prior years (1993 to 2009) emission inventory results.

2 Ground service equipment (GSE) emissions include aircraft auxiliary power units (APUs) as well as vehicles and equipment converted to alternative fuels.

3 Due to the modified roadway configuration and opening of the Ted Williams Tunnel, there was no Ted Williams Tunnel through-traffic (which is defined as traffic passing through but not destined for the Airport) at Logan Airport beginning in 2003.

4 Includes the Central Heating and Cooling Plant, emergency electricity generation, snow melter usage, and other stationary sources.

Oxides of Nitrogen (NO_X)

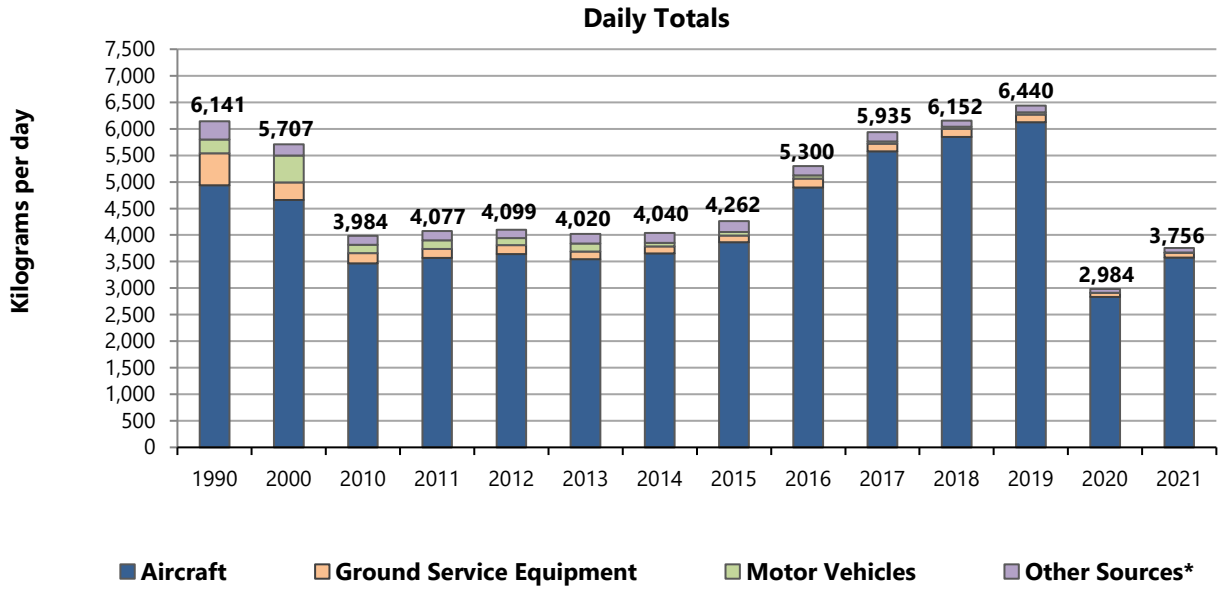
In 2020, total NO_X emissions from all Airport-related sources were estimated to be 1,201 tpy (2,984 kg/day), which represents a decrease from 2019 levels (2,591 tpy or 6,440 kg/day). In 2021, total NO_X emissions from all Airport-related sources were estimated to be 1,511 tpy (3,756 kg/day), which was 41.7 percent less than 2019 levels. The increase from 2020 to 2021 is largely due to the increase in the number of LTOs. In 2020 and 2021, aircraft taxi times remained steady at 22.3 minutes, a 20.4 percent decrease from 2019 taxi time levels. **Figure 7-3** illustrates short- and long-term trends in NO_X emissions and **Table 7-7** shows the NO_X contribution for each emission source in 1990, 2000, and 2010 through 2021. Additionally, **Figure 7-4** shows the percent breakdown of NO_X emissions by source category for 2020 and 2021.

Key findings related to the 2020 and 2021 NO_X emissions inventory results as well as comparisons to the prior 2019 inventory are detailed below. The overall decreases in NO_X emissions from 2019 to 2020 are largely due to the decreases in operational and passenger levels during the pandemic and partially due to the changes in model versions. The number of operations and passengers did increase in 2021 when compared to levels in 2020; consequently, NO_X emissions show an increase from 2020 levels for all source categories.

- When compared to 2019 (AEDT 3c) values, total aircraft-related NO_X emissions were 53.7 percent lower in 2020 (AEDT 3d). 2021 NO_X emissions were 41.6 percent below 2019 levels.
- Total GSE-related emissions (including APUs) of NO_X decreased by 48.3 percent in 2020 (AEDT 3d) compared to 2019 (AEDT 3c). The GSE-related NO_x emissions in 2021 were 39.1 percent less than 2019 levels.
- NO_X emissions from motor vehicles in 2020 decreased by 92.6 percent from 2019 levels due to the decrease (approximately 70 percent) in Airport passenger activities in 2020. The NO_X emissions from motor vehicles in 2021 were 84.2 percent less than 2019 levels.
- Similar to the abovementioned findings, stationary sources showed a decrease in NO_X emissions of 45.1 percent in 2020 compared to 2019. This is primarily attributable to a 20.8 percent decrease in total natural gas fuel usage. The NO_X emissions from stationary sources in 2021 were 35.7 percent less than 2019 levels. Emission factors for 2020 and 2021 were based on the stack test data performed in January of 2020.

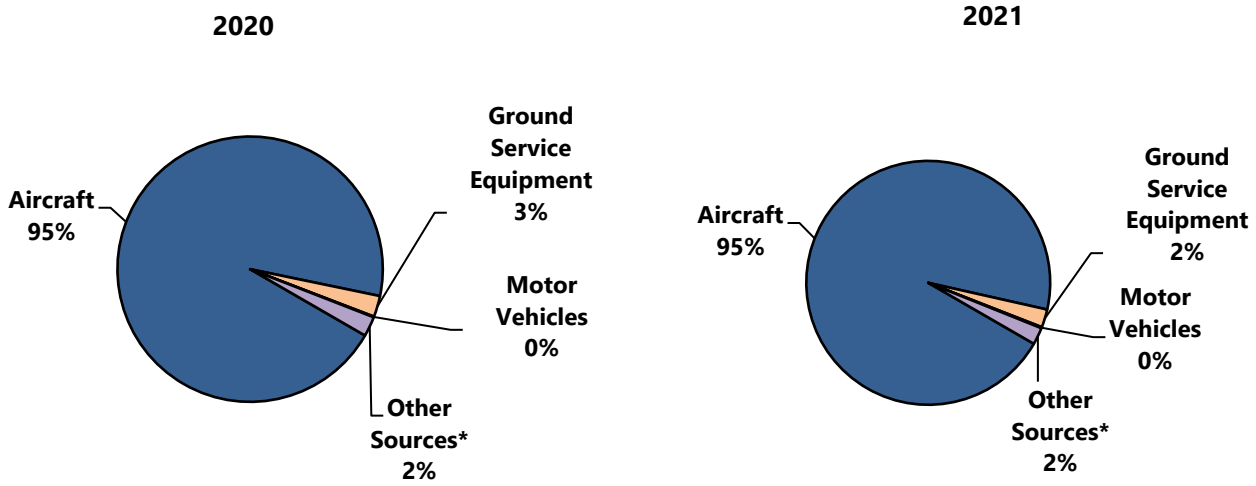
As shown in **Figure 7-4**, aircraft emissions continue to represent in 2020 and 2021 the largest source of NO_X at Logan Airport (approximately 95 percent) with the remaining comprising of GSE, other sources and motor vehicles (approximately 5 percent). This is an important distinction as Massport does not have any control over these emissions.

Figure 7-3 Modeled Emissions of NO_X at Logan Airport, 1990, 2000, and 2010-2021



Source: Massport and CMT, 2022.
Notes: Other sources include stationary sources (e.g., Central Heating and Cooling Plant, snow melter usage, firefighter training, etc.).
In 2020 and 2021, aircraft-related emissions were calculated using AEDT 3c and motor vehicles were calculated using MOVES3.0.3.

Figure 7-4 Sources of NO_X Emissions, 2020 and 2021



Source: Massport and CMT, 2022.
Notes: Other sources include stationary sources (e.g., Central Heating and Cooling Plant, snow melter usage, fire training, etc.).
In 2020 and 2021, aircraft-related emissions were calculated using AEDT 3d and motor vehicles were calculated using MOVES3.0.3.

The changes in modeled NO_X emissions at Logan Airport from 1990 through 2021 presented in **Table 7-7** are a result of a combination of the following:

- **Calculation methodology**. For example, the 1990 inventory was prepared using the Logan Dispersion Modeling System (LDMS), the 2000 through 2015 inventories were prepared using EDMS (the version of which varied by year), and the 2016, 2017, 2018/2019, and 2020/2021 inventories used AEDT (four different versions). As stated in the *2016 EDR,* there are important differences in EDMS and AEDT that resulted in differences when comparing the results between the two models. The primary differences are described in the *2016 EDR* as being differences in the input data, variances in the aircraft operational characteristics, and differences in the aircraft times-in-mode (in particular those for aircraft climb out during which emissions of NO_X are greatest), emission factors, and a more robust airframe/engine database in AEDT. Additionally, there continue to be updates and variances between versions of AEDT.
- **Number of Aircraft Operations**. In 1990, there were 424,568 aircraft operations. By 2010, the number of operations decreased to 352,643. By 2019, the number of aircraft operations slightly surpassed the 1990 level (427,176 operations). Finally, in 2020 and 2021 the number of aircraft operations were 206,702 and 266,034 respectively, levels that reflect the impact of the COVID- pandemic on air travel.
- **Fleet Mix**. Changes in the fleet mix (i.e., greater use of quieter but higher NO_X emitting aircraft) are likely to continue in the future. Most NO_X emissions from aircraft originate from high-temperature, high-pressure reactions of atmospheric nitrogen in aircraft engines. Over time, aircraft engine technology has evolved to be more fuel-efficient, less polluting, and quieter, in large part, due to improved fuel combustion under these higher temperature and pressure conditions. This interdependency (or trade-off) between increased NO_X, less noise, better fuel efficiency, and generally lower emission factors for other pollutants, is an inevitable outcome of the modernization of the commercial air carrier fleet. Aircraft engine manufacturers are continually advancing combustion technology that is designed to mitigate and reverse the trade-offs between lower emissions, less noise, and increased NO_X. Further details on the effect of aircraft engine technology on NO_X is presented in the following section.

Table 7-7 Estimated NO_x Emissions (in kg/day) at Logan Airport, 1990, 2000, and 2010-2021[1]

Aircraft/GSE Model:	LDMS	EDMS v4.03	EDMS v5.1.2	EDMS v5.1.3				EDMS v5.1.4.1					AEDT 2c SP2		AEDT 2d		AEDT 3c			AEDT 3d	
Motor Vehicle Model:	**MOBILE 5a**	**MOBILE 6.0**	**MOBILE 6.2.03**					**MOVES 2010b**	**MOVES 2014**		**MOVES 2014a**				**MOVES 2014b**				**MOVES 3.0.3**		
Year:	**1990**	**2000**	**2010**		**2011**	**2012**	**2013**		**2014**		**2015**	**2016**		**2017**		**2018**	**2019**			**2020**	**2021**
Aircraft Sources																					
Air carriers	4,554	4,202	3,031	3,037	3,128	3,154	3,090	3,158	3,245	3,245	3,470	3,912	4,476	5,098	5,100	5,336	5,292	5,522	2,368	2,334	2,884
Commuter aircraft	133	125	203	204	199	182	168	152	155	155	139	97	126	185	196	251	246	267	117	120	258
Cargo aircraft	237	284	197	197	196	192	188	188	203	203	201	224	228	224	224	236	239	252	319	295	380
General aviation	13	49	29	26	43	115	46	48	48	48	53	60	67	41	57	69	72	82	28	28	54
Total aircraft sources	**4,937**	**4,660**	**3,460**	**3,464**	**3,566**	**3,644**	**3,492**	**3,546**	**3,651**	**3,651**	**3,862**	**4,293**	**4,897**	**5,548**	**5,577**	**5,892**	**5,849**	**6,123**	**2,832**	**2,777**	**3,576**
Ground service equipment[2]	**603**	**333**	**198**	**198**	**173**	**164**	**145**	**145**	**134**	**134**	**128**	**167**	**167**	**143**	**143**	**127**	**149**	**148**	**77**	**77**	**90**
Motor Vehicles																					
Ted Williams Tunnel through-traffic[3]	N/A	26	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Parking/curbside	25	52	12	12	11	10	9	16	11	6	7	6	6	4	4	4	4	3	<1	<1	2
On-airport vehicles	232	425	144	144	148	128	117	131	90	62	59	51	51	37	37	38	38	34	2	2	4
Total motor vehicle sources	**257**	**503**	**156**	**156**	**159**	**137**	**126**	**147**	**101**	**68**	**66**	**57**	**57**	**41**	**41**	**42**	**42**	**37**	**3**	**3**	**6**

Table 7-7 Estimated NO_X Emissions (in kg/day) at Logan Airport, 1990, 2000, and 2010-2021[1] (Continued)

Aircraft/GSE Model:	LDMS	EDMS v4.03	EDMS v5.1.2	EDMS v5.1.3			EDMS v5.1.4.1				AEDT 2c SP2	AEDT 2d	AEDT 3c			AEDT 3d					
Motor Vehicle Model:	**MOBILE 5a**	**MOBILE 6.0**	**MOBILE 6.2.03**				**MOVES 2010b**	**MOVES 2014**	**MOVES 2014a**					**MOVES 2014b**				**MOVES3.0.3**			
Year:	**1990**	**2000**	**2010**	**2011**	**2012**	**2013**	**2014**		**2015**	**2016**	**2017**			**2018**		**2019**		**2020**		**2021**	
Other Sources																					
Fuel storage/ handling[4]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous sources[5]	344	211	166	166	179	154	182	182	187	187	206	179	179	174	174	113	113	132	72	72	85
Total other sources	**344**	**211**	**166**	**166**	**179**	**154**	**182**	**182**	**187**	**187**	**206**	**179**	**179**	**174**	**174**	**112**	**112**	**132**	**72**	**72**	**85**
Total Airport Sources	**6,141**	**5,707**	**3,980**	**3,984**	**4,077**	**4,099**	**3,945**	**4,020**	**4,073**	**4,040**	**4,262**	**4,696**	**5,300**	**5,906**	**5,935**	**6,173**	**6,152**	**6,440**	**2,929**	**2,984**	**3,756**

Source: Massport and CMT, 2022.

Notes: Values may reflect rounding.
N/A – not available.
kg/day - kilograms per day. 1 kg/day is approximately equivalent to 0.40234 tons per year (tpy).
LDMS – Logan Dispersion Modeling System; EDMS – Emissions and Dispersion Modeling System; AEDT – Aviation Environmental Design Tool; MOVES – MOtor Vehicle Emission Simulator.

1 See Appendix I, *Air Quality/Emissions Reduction*, for prior years (1993 to 2009) emission inventory results.
2 Ground service equipment (GSE) emissions include auxiliary power units (APUs) as well as vehicles and equipment converted to alternative fuels.
3 Due to the modified roadway configuration and opening of the Ted Williams Tunnel, there was no Ted Williams Tunnel through-traffic at Logan Airport beginning in 2003.
4 Fuel storage/handling facilities are not a source of NO_X emissions.
5 Includes the Central Heating and Cooling Plant, emergency electricity generation, snow melter usage, and other stationary sources.

Effect of Aircraft Engine Technology on NO_X

As shown in **Table 7-8**, when representative aircraft are compared, as aircraft engines become quieter (improving from Stage 3 to Stage 5) and more efficient, NO_X emissions increase. For comparison, emissions of CO decrease, VOC and $PM_{10}/PM_{2.5}$ emissions fluctuate between noise stage equivalents.

As a means of reducing amounts and costs of fuel use, aircraft engine designers and manufacturers are producing more "fuel-efficient" (i.e., less fuel-burning) engines. This is achieved by enhancing engine performance with improved fuel combustion technologies, greater thrust-generating power, and less engine wear. Aircraft are also being designed to decrease fuel-burn with advancements in aircraft wing and body aerodynamics, light-weight alloy materials, and improved means of navigation. These emerging technologies and reduced fuel burn are expected to reduce emissions, reduce noise, and moderate the growth in NO_X emissions into the future.

Table 7-8 Example Stage 3, Stage 4, and Stage 5 Aircraft Types Operating at Logan Airport

Name	Model	Noise Stage Equivalent	Air Quality (kg/LTO)			
			VOC	NO_X	CO	$PM_{10}/PM_{2.5}$
Boeing MD-81	JT8D-219	3	0.3	8.2	7.2	0.09
767-300 ER	CF6-80C2B7F	4	0.8	8.6	8.9	0.06
787-8 Dreamliner	Trent 1000-N3	5	0.6	42.8	4.9	0.16

Source: Information presented is based on results from the Federal Aviation Administration's Aviation Environmental Design Tool (AEDT), Version 3d.

Notes: kg – kilograms; LTO – landings and takeoffs.
VOCs – volatile organic compounds; NO_X – oxides of nitrogen; CO – carbon monoxide; $PM_{10}/PM_{2.5}$ – particulate matter with a diameter that is 10 micrometers and smaller (PM_{10}) which is inclusive of particulate matter with a diameter that is 2.5 micrometers and smaller ($PM_{2.5}$).

Carbon Monoxide (CO)

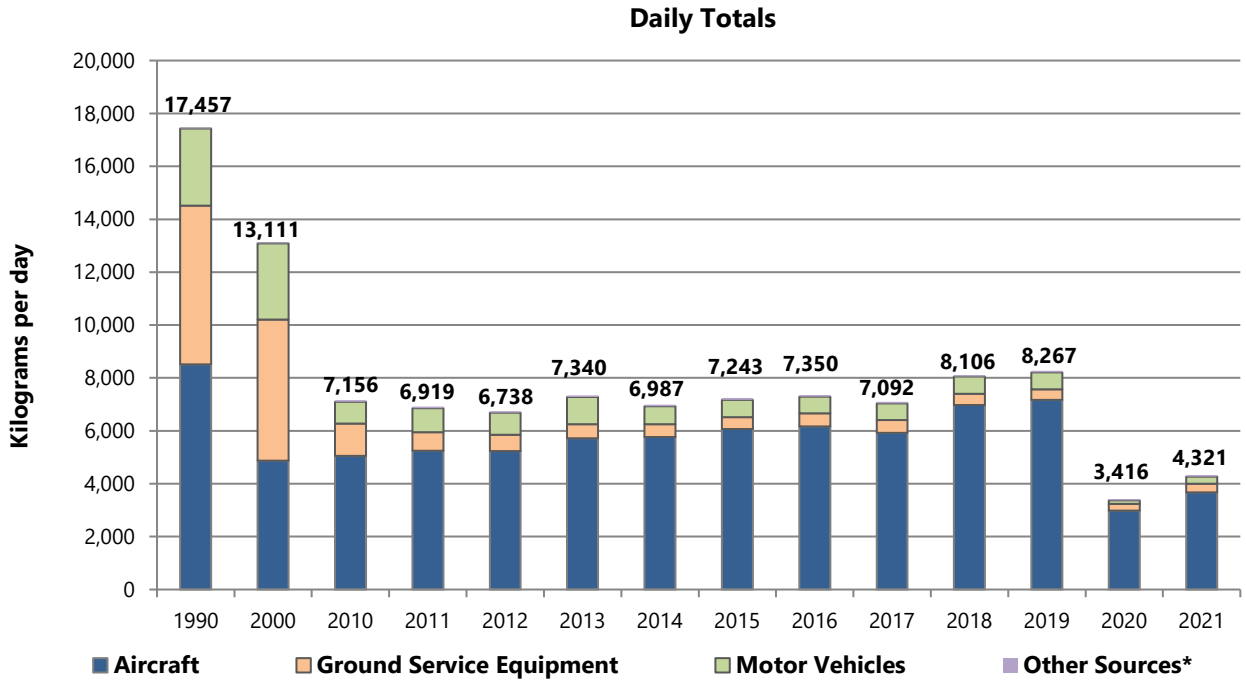
Total CO emissions at Logan Airport in 2020 were 1,374 tpy (3,416 kg/day), about 58.7 percent lower than 2019 levels (3,326 tpy or 8,267 kg/day). Total CO emissions at the Airport in 2021 were 1,739 tpy (4,321 kg/day), or 47.7 percent lower than 2019 levels. **Figure 7-5** shows the long-term downward trend (about 75 percent overall reduction from 1990 levels to 2021) in CO emissions associated with Airport activities. **Table 7-9** also shows the breakdown of these emissions, by source category, for the years 1990, 2000, and 2010 to 2021. Other notable findings of the CO emissions inventory include:

- Aircraft-related CO emissions decreased 58.5 percent in 2020 compared to 2019 levels due to the decrease in operations. Aircraft-related CO emissions in 2021 were 48.7 percent lower than 2019 levels.
- GSE-related (including APUs) CO emissions decreased by 35.9 percent in 2020 compared to 2019, due to the change in aircraft operations and overall decrease in GSE run-time as a result. In 2021, GSE-related CO emissions were 19.7 percent less than 2019 levels.
- CO emissions from motor vehicles decreased in 2020 by 78.8 percent from 2019 levels. This decrease was largely attributable to lower VMT counts from on-Airport vehicles. The CO emissions from motor vehicles in 2021 were 56.8 percent less than 2019 levels.
- Stationary sources showed a decrease of 24.4 percent in CO emissions in 2020 compared to 2019. This is primarily attributable to a decrease in boiler and emergency generator usage by the Airport in 2020. In comparison, there is an increase of 5.4 percent from 2021 compared to 2020. This increase is instead attributable to an increase in overall stationary source usage by the Airport. The CO emissions from stationary sources in 2021 are 20.3 percent less than 2019 levels.

Again, as with total emissions of VOCs and NO_X, the overall, long-term trend over the past two decades reveals a substantial decrease in total CO emissions associated with Airport activities.

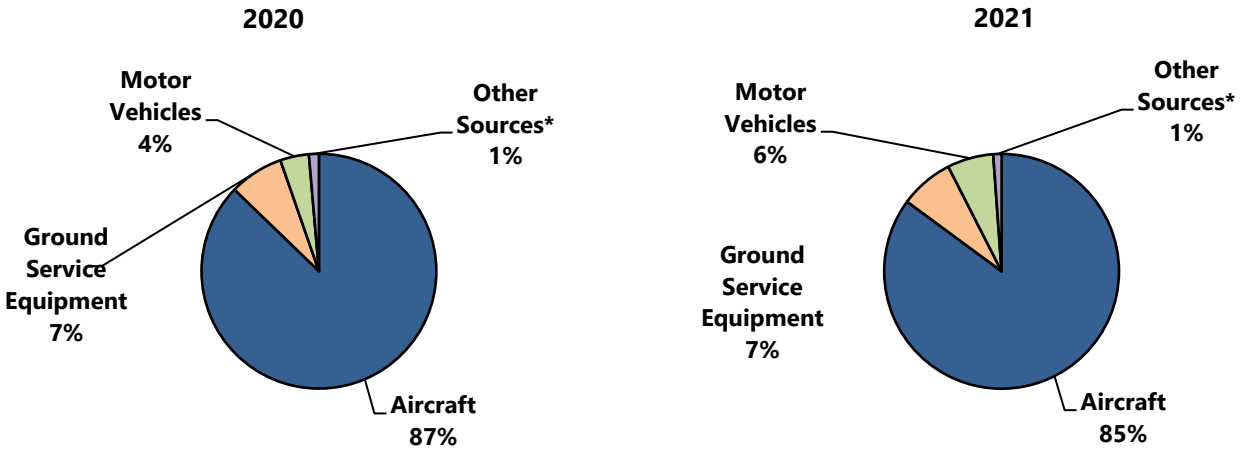
As shown in **Figure 7-6**, in 2020 and 2021, aircraft emissions continued to represent the largest source of CO (approximately 87 percent and 85 percent, respectively) at Logan Airport, followed by GSE (approximately 7 percent for both years), motor vehicles (approximately 4 percent and 6 percent, respectively), and other sources (approximately 1 percent for each year).

Figure 7-5 Modeled Emissions of CO at Logan Airport, 1990, 2000, and 2010-2021



Source: Massport and CMT, 2022.
Notes: Other stationary sources are not visible on the graph as they make up less than 1 percent of the total.
In 2020 and 2021, aircraft-related emissions were calculated using AEDT 3d and motor vehicles were calculated using MOVES3.0.3.

Figure 7-6 Sources of CO Emissions, 2020 and 2021



Source: Massport and CMT, 2022.
Notes: Other sources include stationary sources (e.g., Central Heating and Cooling Plant, snow melter usage, fire training, etc.) and fueling sources.
In 2020 and 2021, aircraft-related emissions were calculated using AEDT 3d and motor vehicles were calculated using MOVES3.0.3.

Table 7-9 Estimated CO Emissions (in kg/day) at Logan Airport, 1990, 2000, and 2010-2021[1]

Aircraft/GSE Model:	LDMS	EDMS v4.03	EDMS v5.1.2	EDMS v5.1.3				EDMS v5.1.4.1			AEDT 2c SP2				AEDT 2d	AEDT 3c			AEDT 3d		
Motor Vehicle Model:	**MOBILE 5a**	**MOBILE 6.0**	**MOBILE 6.2.03**					**MOVES 2010b**	**MOVES 2014**		**MOVES 2014a**				**MOVES 2014b**				**MOVES 3.0.3**		
Year:	**1990**	**2000**	**2010**	**2011**	**2012**	**2013**		**2014**		**2015**	**2016**	**2017**			**2018**		**2019**	**2020**		**2021**	
Aircraft Sources																					
Air carriers	6,613	2,994	2,531	2,531	2,592	2,816	3,320	3,323	3,486	3,486	3,729	3,879	3,653	3,736	3,740	3,955	3,976	4,182	1,368	1,355	1,549
Commuter aircraft	977	1,188	2,629	2,086	2,042	1,928	1,978	1,907	1,795	1,795	1,826	1,737	1,998	1,905	1,525	1,661	2,483	2,477	1,247	1,251	1,617
Cargo aircraft	576	400	248	259	246	183	155	155	164	164	167	192	201	192	192	143	145	150	229	233	289
General aviation	352	295	177	173	370	304	345	334	319	319	353	336	314	526	470	353	374	363	141	139	223
Total aircraft sources	**8,518**	**4,877**	**5,585**	**5,049**	**5,250**	**5,232**	**5,798**	**5,719**	**5,764**	**5,764**	**6,075**	**6,144**	**6,166**	**6,359**	**5,926**	**6,113**	**6,978**	**7,171**	**2,985**	**2,979**	**3,678**
Ground service equipment[2]	**6,001**	**5,335**	**1,222**	**1,222**	**694**	**618**	**533**	**533**	**484**	**484**	**442**	**493**	**493**	**482**	**483**	**392**	**428**	**397**	**255**	**255**	**319**
Motor Vehicles																					
Ted Williams Tunnel through-traffic[3]	N/A	133	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Parking/curbside	1,218	495	106	106	110	104	104	94	57	51	28	37	37	32	32	28	28	28	2	2	4
On-airport vehicles	1,689	2,245	726	726	806	737	742	935	591	630	630	596	596	592	592	620	620	609	132	132	271
Total motor vehicle sources	**2,907**	**2,873**	**832**	**832**	**916**	**840**	**846**	**1,029**	**648**	**681**	**658**	**633**	**633**	**623**	**623**	**648**	**648**	**636**	**135**	**135**	**275**

Table 7-9 Estimated CO Emissions (in kg/day) at Logan Airport, 1990, 2000, and 2010-2021[1] (Continued)

Aircraft/GSE Model:	LDMS	EDMS v4.03	EDMS v5.1.2	EDMS v5.1.3				EDMS v5.1.4.1				AEDT 2c SP2			AEDT 2d		AEDT 3c			AEDT 3d	
Motor Vehicle Model:	MOBILE 5a	MOBILE 6.0	MOBILE 6.2.03					MOVES 2010b	MOVES 2014		MOVES 2014a				MOVES 2014b					MOVES3.0.3.	
Year:	1990	2000	2010	2011	2012	2013		2014		2015	2016		2017		2018		2019	2020		2021	
Other Sources																					
Fuel storage/ handling[4]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous sources[5]	31	27	53	53	59	48	59	59	58	58	68	58	58	60	60	52	52	62	47	47	49
Total other sources	**31**	**27**	**53**	**53**	**59**	**48**	**59**	**59**	**58**	**58**	**68**	**58**	**58**	**60**	**60**	**52**	**52**	**62**	**47**	**47**	**49**
Total Airport Sources	**17,457**	**13,112**	**7,962**	**7,156**	**6,919**	**6,738**	**7,236**	**7,340**	**6,954**	**6,987**	**7,243**	**7,328**	**7,350**	**7,524**	**7,092**	**7,205**	**8,106**	**8,267**	**3,421**	**3,416**	**4,321**

Source: Massport and CMT, 2022.

Notes: Values may reflect rounding.
N/A – not available.

1 See Appendix I, *Air Quality/Emissions Reduction*, for prior years (1993 to 2009) emission inventory results.

2 Ground service equipment (GSE) emissions include aircraft auxiliary power units (APUs) as well as vehicles and equipment converted to alternative fuels.

3 Due to the modified roadway configuration and opening of the Ted Williams Tunnel, there was no Ted Williams Tunnel through-traffic at Logan Airport beginning in 2003.

4 Fuel storage/handling facilities are not a source of NO_X emissions.

5 Includes the Central Heating and Cooling Plant, emergency electricity generation, snow melter usage, and other stationary sources.

Particulate Matter

Estimated $PM_{10}/PM_{2.5}$ emissions at Logan Airport in 2020 and 2021 are presented in **Table 7-10**. The 2020 results show total emissions of 20 tpy (49 kg/day), or 46.9 percent lower than 2019 levels (37 tons per year or 92 kg/day). The 2021 $PM_{10}/PM_{2.5}$ emissions remain 22.7 percent lower than 2019 levels. Explanations of these results and other key findings include the following:

- Estimated aircraft-related $PM_{10}/PM_{2.5}$ emissions decreased by 53.1 percent in 2020 (AEDT 3d) compared to 2019 (AEDT 3c) levels. This decrease is attributable to the change in aircraft operations. Aircraft-related $PM_{10}/PM_{2.5}$ emissions in 2021 were 44.1 percent lower than 2019 levels.
- $PM_{10}/PM_{2.5}$ associated with GSE-related emissions (including APUs) decreased by 50.4 percent in 2020 (AEDT 3d) when compared to 2019 (AEDT 3c), largely due to the change in operations and fleet mix which decreased aircraft-based GSE/APU operating times. In 2021, emissions remained 38.9 percent lower than 2019 levels.
- $PM_{10}/PM_{2.5}$ emissions from motor vehicles decreased by 27.0 percent in 2020 when compared to 2019 levels, primarily attributable to a decrease in motor vehicle volumes. Notably, 2021 $PM_{10}/PM_{2.5}$ emissions from motor vehicles increased by 57.1 percent from 2019 levels even though VMT counts remained below 2019 levels (43.3 percent lower). This is primarily attributable to the differences in database servers (i.e., MariaDB versus MySQL) between the two different model versions of MOVES (MOVES3.0.3 versus MOVES2014) discussed earlier in the chapter.
- Stationary source emissions of $PM_{10}/PM_{2.5}$ decreased by 29.0 percent in 2020 compared to 2019 due to a decrease in stationary source activity levels. In 2021, emissions increased by 12.1 percent due to an increase in stationary source fuel usage by the Airport. The $PM_{10}/PM_{2.5}$ emissions from stationary and other non-mobile sources in 2021 are 20.3 percent less than 2019 levels.

As shown in **Figures 7-7** and **7-8**, in 2020 and 2021, aircraft emissions represented the largest source (56 percent and 46 percent, respectively) of $PM_{10}/PM_{2.5}$ at Logan Airport, followed by motor vehicles (27 percent and 40 percent, respectively), GSE (14 percent and 12 percent, respectively), and other sources, such as the Central Heating and Cooling Plant, snow melter usage, and fire training (3 percent for each year).

Table 7-10 Estimated $PM_{10}/PM_{2.5}$ Emissions (in kg/day) at Logan Airport, 2010-2021[1]

Aircraft/GSE Model:	EDMS v5.1.2	EDMS v5.1.3				EDMS v5.1.4.1					AEDT 2c SP2		AEDT 2d		AEDT 3c			AEDT 3d	
Motor Vehicle Model:	MOBILE 6.2.03					MOVES 2010b	MOVES 2014	MOVES 2014a					MOVES 2014b				MOVES 3.0.3		
Year:	2010		2011	2012	2013		2014		2015	2016		2017		2018		2019	2020		2021
Aircraft Sources																			
Air carriers	34	34	35	43	41	48	48	48	53	57	52	36	36	37	49	51	23	23	26
Commuter aircraft	4	4	3	2	2	7	7	7	7	6	4	2	3	3	4	4	2	2	2
Cargo aircraft	3	3	3	3	2	3	3	3	3	3	2	1	1	1	1	1	2	2	2
General aviation	2	2	4	3	3	4	4	4	4	4	2	3	2	2	2	2	1	1	1
Total aircraft sources	**43**	**43**	**45**	**51**	**48**	**62**	**62**	**62**	**66**	**70**	**60**	**42**	**43**	**43**	**56**	**58**	**27**	**27**	**32**
Ground service equipment[2]	**13**	**13**	**13**	**13**	**12**	**12**	**12**	**12**	**12**	**15**	**15**	**14**	**14**	**11**	**14**	**14**	**7**	**7**	**8**
Motor Vehicles																			
Parking/curbside	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1<	1<	1<
On-airport vehicles	6	6	6	6	6	14	14	18	16	17	17	18	18	18	18	18	13	13	28
Total motor vehicle sources	**6**	**6**	**6**	**6**	**6**	**15**	**14**	**18**	**17**	**18**	**18**	**18**	**18**	**18**	**18**	**18**	**13**	**13**	**29**
Other Sources																			
Fuel storage/handling[3]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miscellaneous sources[4]	2	2	3	2	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2
Total other sources	**2**	**2**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	2
Total Airport Sources	**64**	**64**	**67**	**72**	**69**	**92**	**91**	**95**	**98**	**106**	**96**	**77**	**77**	**74**	**90**	**92**	**49**	**49**	**71**

Sources: Massport and CMT, 2022

Notes: Values may reflect rounding. kg/day - kilograms per day. 1 kg/day is approximately equivalent to 0.40234 tons per year (tpy); $PM_{10}/PM_{2.5}$ – particulate matter with a diameter that is 10 micrometers and smaller (PM_{10}) which is inclusive of particulate matter with a diameter that is 2.5 micrometers and smaller ($PM_{2.5}$).
EDMS – Emissions and Dispersion Modeling System; AEDT – Aviation Environmental Design Tool; MOVES – MOtor Vehicle Emission Simulator.

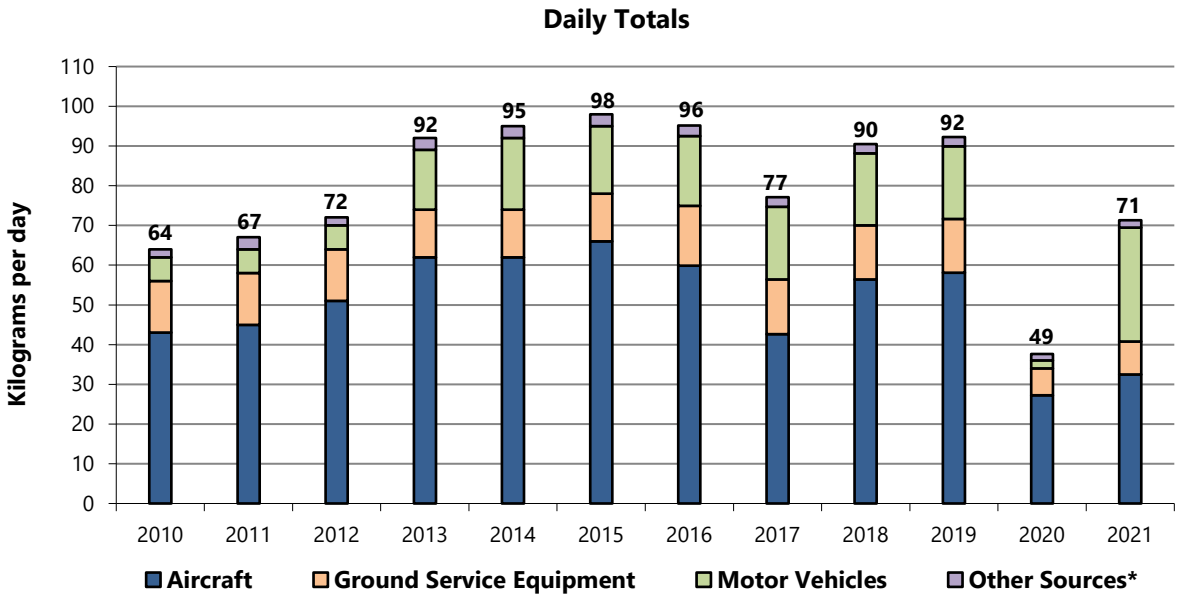
1 See Appendix I, Air *Quality/Emissions Reduction*, for prior years (1993 to 2009) emission inventory results.

2 Ground service equipment (GSE) emissions include auxiliary power units (APUs) as well as vehicles and equipment converted to alternative fuels.

3 Fuel storage and handling facilities are not sources of $PM_{10}/PM_{2.5}$ emissions.

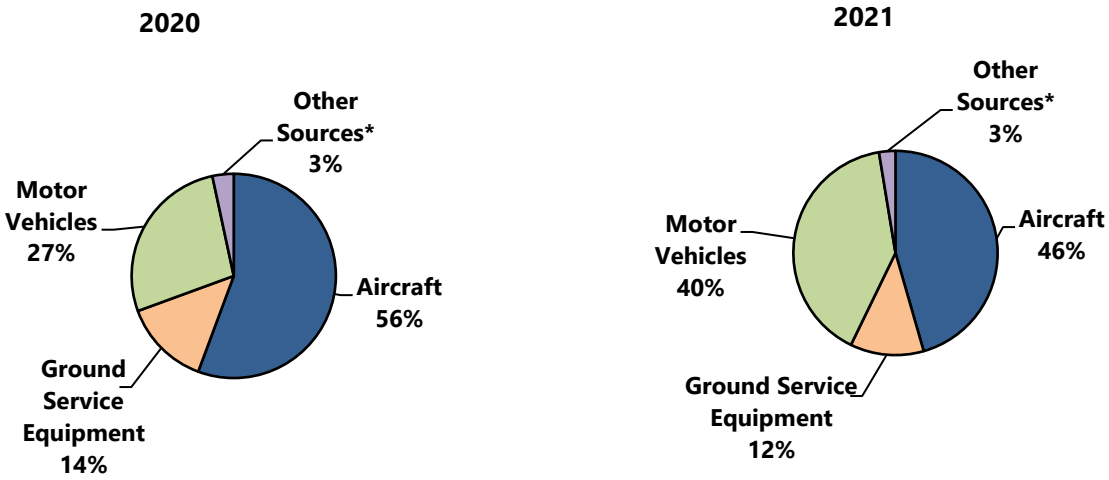
4 Includes the Central Heating and Cooling Plant, emergency electricity generation, fire training, snow melters, and other stationary sources.

Figure 7-7 Modeled Emissions of $PM_{10}/PM_{2.5}$ at Logan Airport, 2010-2021



Source: Massport and CMT, 2022.
Notes: 2005 (not shown) was the first year particulate matter ($PM_{10}/PM_{2.5}$) was included in the EDR/ESPR emission inventories.
In 2020 and 2021, aircraft-related emissions were calculated using AEDT 3d and motor vehicles were calculated using MOVES3.0.3.
Other sources include stationary sources (e.g., Central Heating and Cooling Plant, snow melter usage, fire training, etc.).

Figure 7-8 Sources of $PM_{10}/PM_{2.5}$ Emissions, 2020 and 2021



Source: Massport and CMT, 2022.
Note: Other sources include stationary sources (e.g., Central Heating and Cooling Plant, snow melter usage, fire training, etc.). In 2020 and 2021, aircraft-related emissions were calculated using AEDT 3d and motor vehicles were calculated using MOVES3.0.3.

Ultrafine Particles (UFPs)

Within the field of air quality, airborne particles are collectively categorized as PMs and subdivided into size categories based on their diameters. These divisions are total suspended particles (TSP) with diameters ranging from 2.5 to 40 micrometers (µm), coarse particles (PM_{10}) with diameters ranging from 2.5 to 10 µm, fine particles ($PM_{2.5}$) with diameters less than 2.5 µm, and UFPs with diameters less than 0.1 µm. Most of these particles originate from the exhaust gases generated by fossil fuel-powered engines and other high-temperature combustion sources including aircraft.

Under the CAA, EPA has established NAAQS for six criteria air pollutants including PM_{10} and $PM_{2.5}$. Outdoor concentrations within EPA standards are considered safe for the public. Presently, UFPs (by themselves) are not regulated ambient air pollutants. UFPs cannot be considered part of $PM_{2.5}$ because $PM_{2.5}$ regulates by a mass per volume concentration, and UFPs have a comparatively negligible mass. Any eventual UFP regulation would likely be regulated by particle count (or particle number concentrations).

On December 18, 2020, the EPA published a final action in the Federal Register detailing the agency's review of the NAAQS for PM_{10}/$PM_{2.5}$. UFP is addressed in the supplemental information of the notice. In their review of the PM_{10}/$PM_{2.5}$ NAAQS, the agency determined that due to significant uncertainties and limitations, as well as the limited availability of air monitoring data, that the $PM_{2.5}$ NAAQS would be retained as the indicator for UFP.[19]

Studies conducted at Zurich Airport in Switzerland and London Heathrow Airport in England have demonstrated that UFP dispersion is highly dependent on wind speed and direction with UFP particle counts being on the order of 10 times higher when measured downwind of the airports.[20,21] A study conducted at Brussels Airport in Belgium demonstrated the UFP emissions from the airport can significantly impact concentrations up to 7 kilometers (4.3 miles) away from the source.[22] These studies have begun to explain the dispersion characteristics of UFPs from airports, but specific health studies to assess impacts of UFPs from airport sources have yet to be conducted.

A study performed by the University of Southern California demonstrated adverse health effects following exposure to airport-related and roadway traffic-related UFPs near Los Angeles International Airport. To understand the distinct health impacts associated with each source, a source apportionment analysis was conducted.[23] The University of Washington conducted a *Mobile ObserVations of Ultrafine Particles (MOV-UP) study* of air traffic-related air quality impacts for communities located below and near the flight paths of Seattle-Tacoma International Airport. The findings show key differences exist in the particle size distribution and the black carbon (BC) concentration for roadway and aircraft features. These differences are important because they help

19 Federal Register, Volume 85, No. 244, Page 82684.

20 Fleuti, E., Maraini, S., Bieri, L., 2017. *Ultrafine Particle Measurements at Zurich Airport.* Flughafen Zurich AG.

21 Masiol, M., Harrison, R. M., Vu, T. V., and Beddows, D. C. S. *Sources of Submicrometre Particles Near a Major International Airport,* Atmos. Chem. Phys. Discuss., doi.org/10.5194/acp-2017-150, in review, 2017.

22 Peters, J., Berghmans, P., and Frijns, E. 2016. *Ultrafine Particles and Black Carbon monitoring in the surroundings of Brussels Airport.* Brussels Environmental Agency.

23 Habre, Rima et al. "Short-term effects of airport-associated ultrafine particle exposure on lung function and inflammation in adults with asthma." *Environment international,"* vol. 118 (2018): 48-59, doi:10.1016/j.envint.2018.05.031.

distinguish between the spatial impact of roadway traffic and aircraft UFP emissions using a combination of mobile monitoring and standard statistical methods.[24]

In 2021, as part of the Center for Air Climate and Energy Solutions (CACES), a team from the University of Washington and Virginia Tech developed the first national model estimate for airborne UFP concentrations. The model will ultimately lead to a better understanding of UFP effects on health and could one day impact air pollution policy.[25]

Massport is supportive of cooperative research efforts that are being funded by the FAA and co-led by Washington State University and the Massachusetts Institute of Technology (MIT), which are known as the FAA Center of Excellence for Alternative Jet Fuels and Environment, Aviation Sustainability Center (ASCENT).[26] The primary purpose of the research is the measurement of aviation emissions and their contribution to ambient levels of air pollution. As part of the studies, ACSCENT is measuring UFPs in the vicinity of Logan Airport to determine spatial and short-term temporal variations in the contribution of aviation emissions to ground level air pollutant concentrations. They are also constructing regression models using measured data from the years 2017 and 2018 to determine the contributions of aviation sources to UFP and BC.[27]

Massport has/is also cooperating with Boston University, Tufts University, and other researchers in identifying aircraft-specific related UFPs in an urban environment with non-airport related sources. This research is ongoing in the East Boston area and Massport continues to contribute by providing Logan Airport operational and other pertinent data.

Greenhouse Gas (GHG) Assessment

GHGs are known to contribute to climate change. In 2009, the EPA issued a proposed finding that GHGs also contribute to air pollution that may endanger public health or welfare. This action laid the initial legal groundwork for the regulation of GHG emissions nationwide under the CAA, although currently there are no specific U.S. laws or regulations that call for the regulation of GHGs for airports directly.[28] According to the U.S. General Accountability Office (GAO), aviation accounts "for about 3 percent of total U.S. greenhouse gas emissions from human sources", compared with other industrial sources, including the remainder of the transportation sector (23 percent) and industry (41 percent).[29] Additionally, the EPA's most recent *Inventory of U.S. GHG Emissions and Sinks* (2020) also demonstrates that aircraft emissions represent 5.6 percent of the U.S. transportation sector GHG emissions. In turn, the transportation GHG emissions are estimated to be 27 percent of total U.S. emissions.[30]

24 University of Washington, Department of Environmental & Occupational Health Sciences, *Mobile ObserVations of Ultrafine Particles: The MOV-UP study report*, December 2019, https://deohs.washington.edu/sites/default/files/Mov-Up%20Report.pdf.

25 Provat K. Saha et al, High-Spatial-Resolution Estimates of Ultrafine Particle Concentrations across the Continental United States, Environmental Science & Technology (2021). DOI: 10.1021/acs.est.1c03237.

26 U.S. DOT, Federal Aviation Administration, Center of Excellence for Alternative Jet Fuels & Environment. https://ascent.aero/.

27 ASCENT Project 018 2020 Annual Report (wsu.edu).

28 GHG emission reduction measures have been adopted by the EPA for new aircraft engines, but these regulations do not apply directly to airports.

29 U.S. DOT, Federal Aviation Administration, *Aviation Emissions and Air Quality Handbook (Version 3, Update 1)*, January 2015.

30 EPA, *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2020*, April 2022, https://www.epa.gov/system/files/documents/2022-04/us-ghg-inventory-2022-main-text.pdf.

In May 2010, the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) revised the *Massachusetts Environmental Policy Act (MEPA) Greenhouse Gas Emissions Policy and Protocol*.[31] Under the revised policy, certain projects subject to review under MEPA (though not annual EDR/ESPR filings) are required to:

- Quantify GHG emissions generated by a proposed project; and
- Identify measures to avoid, minimize, or mitigate such emissions.[32]

With respect to the *2020/2021 EDR* GHG emissions inventories,[33] the following information is noteworthy:

- Although the *2020/2021 EDR* is not subject to the MEPA GHG policy (because it does not propose any discrete projects), since the *2007 EDR,* Massport has voluntarily prepared an inventory of GHG emissions both directly and indirectly associated with the Airport.
- The emission source categories in the *2020/2021 EDR* comply with MEPA's requirement to analyze the environmental impacts of direct and indirect mobile and stationary source emissions.
- The 2020 and 2021 GHG emissions inventories were prepared following methodological guidance by the TRB, ACRP, and the ACI ACA program. The inventory assigns GHG emissions based on Scopes 1, 2, and 3, which are based on ownership or control (whether they are controlled by Massport, the airlines or other airport tenants, or the public).
- The 2020 and 2021 GHG emissions inventories include aircraft emissions for all operational modes up to AEDT's default atmospheric mixing height of 3,000 feet. GHG emissions associated with GSE/APU, motor vehicles, a variety of stationary sources, and electricity usage were also included.
- Massport has direct ownership or control over a small percentage of the GHG emission sources (which include Massport fleet vehicles, stationary sources, and electrical consumption within Massport buildings). Most of the emission sources are owned or controlled by the airlines, other airport tenants (such as rental car companies), and the public (such as passenger motor vehicles).
- Massport also prepares two other GHG emissions inventories for stationary sources at Logan Airport:
  - A GHG emissions inventory for the MassDEP GHG Emissions Reporting Program for those sources meeting the criteria for Category 1 and Scope 1 (only those sources under the direct ownership and control of Massport);[34,35] and
  - An EPA Greenhouse Gas Summary Report. [36]

31 Commonwealth of Massachusetts, Executive Office of Energy and Environmental Affairs, Revised MEPA Greenhouse Gas Emissions Policy and Protocol, effective May 5, 2010, https://www.mass.gov/files/documents/2016/08/rp/ghg-policy-final-summary.pdf.

32 GHGs are comprised primarily of carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), and three groups of fluorinated gases (i.e., sulfur hexafluoride [SF_6], hydrofluorocarbons [HFCs], and perfluorocarbons [PFCs]). GHG emission sources associated with airports are generally limited to CO_2, CH_4, and N_2O.

33 This EDR GHG inventory is one of three that Massport prepares annually; however, the other two comprise only stationary sources of GHGs and are filed with MassDEP and the EPA, respectively. These reports are for Massport-owned-and-operated equipment only, and do not cover any tenant owned/operated-equipment or facilities.

34 Boston Logan International Airport. 2020 and 2021. Massachusetts Department of Environmental Protection (MassDEP) GHG Emissions Reporting Program.

35 Starting with the 2016 reporting year MassDEP combined GHG Reporting with its Source Registration reporting program.

36 EPA, Greenhouse Gas Summary Report for Boston Logan International Airport for calendar year 2020 and 2021.

Consistent with ACRP and ACA guidelines, the GHG emissions are based on ownership and/or control and are delineated as follows:

- **Scope 1/Direct** – GHG emissions from sources that are owned and controlled by the reporting entity (in this case, Massport), such as stationary sources and Airport-owned fleet motor vehicles.
- **Scope 2/Indirect** – GHG emissions associated with the generation of electricity consumed but generated off-site at public utilities.
- **Scope 3/Indirect and Optional** – GHG emissions that are associated with the activities of the reporting entity (in this case, Massport), but are associated with sources that are owned and controlled by others. These include aircraft-related emissions, emissions from Airport tenant activities, as well as ground transportation to and from the Airport.

The ownership categorization and the emission sources by scope are further detailed in **Table 7-11**. It is also important to note that the GHG emissions inventories computed for this *2020/2021 EDR* are consistent, wherever applicable, with the data provided by Massport for the MassDEP and EPA GHG inventories for Logan Airport for 2020 and 2021. Notably, the *2020/2021 EDR* emissions inventories presented are more comprehensive, as they cover all three scopes of GHG emissions including those from tenants and the public, whereas the MassDEP and EPA GHG Reporting Program covers only stationary sources (Scope 1 sources).

Tables 7-12 and **7-13** present the 2020 and 2021 GHG emissions inventories, respectively. The emissions are segregated by Scope and reported in CO_2 equivalent values (CO_2e).[37] As shown, in 2020 Massport-controlled emissions as well as purchased electricity (Scopes 1 and 2, respectively) represent 22.7 percent, and Scope 3 emissions (which are public and tenant owned and controlled) represent 77.3 percent of GHG emissions. In 2021, Scopes 1 and 2 emissions represent 18.3 percent, and Scope 3 emissions represent 81.7 percent. Notably, the percentage of emissions from purchased electricity in 2020 (12.5 percent) was higher than 2021 (9.8 percent) even though usage rose approximately 4 percent in 2021. This is strictly due to the difference in emission factors between the two analysis years. The 2021 emissions factors for electricity for CO_2, CH_4, and N_2O are lower by 6.4 percent, 6.1 percent, and 9.1 percent, respectively.

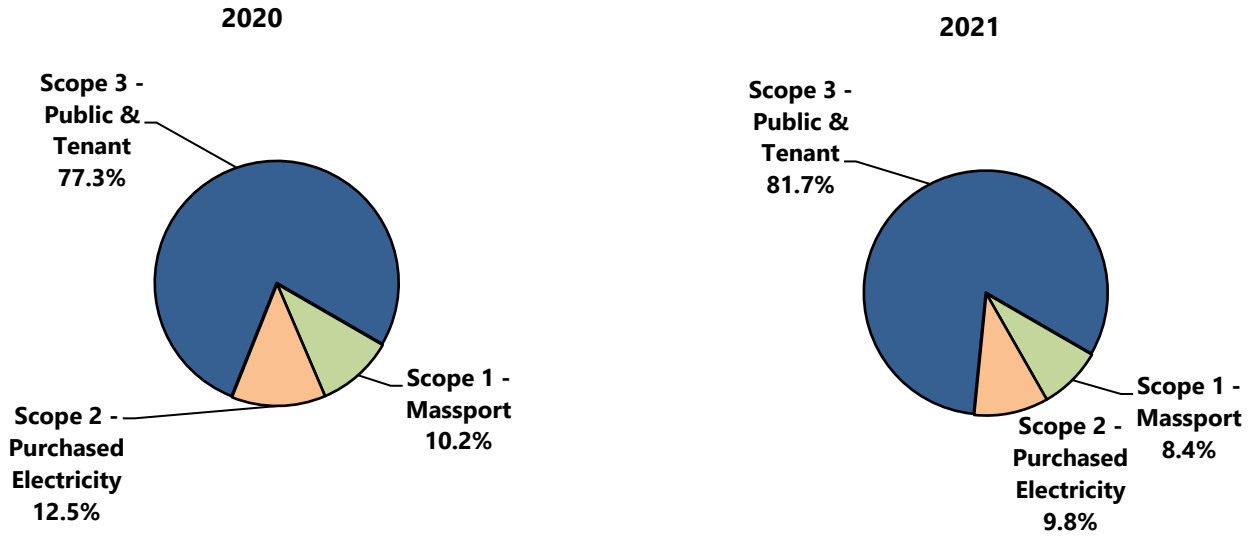
Furthermore, in the 2020 and 2021 GHG emission inventories Scope 3 (e.g., aircraft, GSE/APUs) still represent the largest source of emissions, followed by Scope 2 (i.e., electricity generation) and Scope 1 (e.g., stationary sources, airport fleet vehicles) as shown in **Figure 7-9**.

Overall, total GHG emissions in 2020 decreased by about 60 percent and 2021 decreased by 51 percent from 2019 levels. This reduction in GHGs is attributable to the COVID pandemic as flights in and out of Logan Airport were dramatically reduced and passenger levels significantly dropped. As a result, the number of aircraft operations in 2020 decreased by approximately 52 percent and the number of passengers in 2020 decreased by approximately 70 percent compared to 2019 levels. Furthermore, aircraft operations in 2021 decreased by approximately 38 percent and the number of passengers in 2021 decreased by approximately 47 percent compared to 2019 levels.

37 CO_2 equivalent values are based upon the GWP values of 1 for CO_2, 28 for CH_4, and 265 for N_2O (based on a 100-year period) as presented in the IPCC Fifth Assessment Report (2014).

GHG emissions associated with Logan Airport in 2020 and 2021 are both approximately less than 1 percent of the most recent statewide emissions estimates,[38] and approximately 6 percent of Boston's citywide emissions.[39] Massport plans to continue updating its GHG Emissions Inventory for Logan Airport annually.

Figure 7-9 Sources of GHG Emissions by Scope, 2020 and 2021



Source: Massport and CMT, 2022.

Notes: Scope 1 emissions are from sources that are owned or controlled by Massport (i.e., ground support vehicles, Massport shuttles, on-airport traffic, and stationary sources), Scope 2 emissions are from electrical consumption (both Massport and tenant), which are generated off-Airport at power generating plants, and Scope 3 emissions are from aircraft, ground service equipment (GSE) including auxiliary power units (APUs), and ground transportation to and from the Airport.

38 2020 and 2021 percentages are based on relative amount of Airport total of direct emissions to 2019 statewide totals. 2019 statewide totals are derived from MassDEP's 2nd Addendum to the Statewide Greenhouse Gas Emissions Level: 1990 Baseline Update (June 2022) report, available at https://www.mass.gov/doc/2nd-addendum-to-statewide-ghg-level-proposed-1990-baseline-update-june-2022/download.

39 City of Boston, Boston Community GHG Emissions, updated March 21, 2022, https://www.boston.gov/departments/environment/bostons-carbon-emissions.

Table 7-11 Emission Sources by Scope

Scope	Source
Scope 1 – Emissions from Sources that are Owned and/or Controlled by Massport	Massport Fleet Vehicles & Equipment (i.e., Massport Ground Service Equipment, Massport Shuttles and Express Buses)
	On-Airport Parking Lots
	Stationary Sources (includes generators, boilers, etc.)
	Fire Training
Scope 2 - Emissions Associated with the Generation of Electricity Consumed but Generated off-site at Public Utilities	Electrical Consumption (Massport, Tenant, and Common Areas)[1]
Scope 3 - Emissions from Sources that are Public and Tenant Owned and Controlled	Aircraft (on-ground, within the LTO up to 3,000 feet)[2]
	Auxiliary Power Units
	Ground Service Equipment
	Passenger and Employee Transportation (Off- and On-Airport Employee/Tenant/Public Vehicle Trips - includes private automobiles, taxis, limousines, buses, shuttle vans, etc.)

Sources: National Academies of Sciences, Engineering, and Medicine 2009, Transportation Research Board, Airport Cooperative Research Program, Report 11: Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories, Washington, D.C.: The National Academies Press, https://nap.nationalacademies.org/catalog/14225/guidebook-on-preparing-airport-greenhouse-gas-emissions-inventories, and CMT.

Notes: LTO - landing and takeoff cycle.

1 Aircraft cruise mode emissions above the 3,000-foot atmospheric mixing height were not included.

2 Per ACRP Report 11 and for consistency with prior EDR/ESPR inventories, emissions associated with the generation of electricity consumed but generated off-site at public utilities are considered Scope 2. However, per ACA guidance, off-site emissions from the generation of purchased electricity and heat that is metered and on-sold to tenants do not count as Airport Scope 2 emissions but are instead considered Scope 3.

Table 7-12 Estimated Greenhouse Gas Emissions (GHG) Inventory (in MT of CO2e) by Scope at Logan Airport, 2020

Scope	Source	CO_2	N_2O	CH_4	Totals
Scope 1 – Emissions from Sources that are Owned and/or Controlled by Massport	Massport Ground Service Equipment[1]	3,930	39	18	3,987
	Massport Shuttle Bus	1,300	10	11	1,321
	Massport Express Bus	2,527	32	1	2,560
	On-Airport Parking Lots	1,530	6	1	1,536
	Stationary Sources[2]	23,295	13	13	23,322
	Fire Training	37	1	<1	38
	Total Scope 1 Emissions (10.2%)	**32,619**	**101**	**43**	**32,764**
Scope 2 - Emissions Associated with the Generation of Electricity Consumed	Massport	3,426	19	15	3,460
	Tenant/Common Area	36,128	202	159	36,489
	Total Scope 2 Emissions (12.5%)[3]	**39,554**	**221**	**174**	**39,949**
Scope 3 - Emissions from Sources that are Public and Tenant Owned and Controlled	Aircraft – Ground[4]	84,309	686	8	85,003
	Aircraft – Ground to 3,000 feet[5]	125,318	1,019	15	126,351
	Aircraft - Engine Startup	2,318	19	-[9]	2,340
	Auxiliary Power Units	6,396	52	-[9]	6,455
	Ground Service Equipment	8,768	93	32	8,893
	Passenger and Employee Transportation[6]	18,425	46	17	18,488
	Total Scope 3 Emissions (77.3%)	**245,533**	**1,915**	**82**	**247,530**
Total Logan Airport Emissions (100%)[7]		**317,706**	**2,236**	**299**	**320,242**
Percent of Statewide Totals[8]		**<1.0%**	**<1.0%**	**<1.0%**	**<1.0%**

Source: Massport and CMT, 2022.

Notes: MT - metric tons of CO_2 equivalents (1 MT = 1.1 Short Tons). CO_2 equivalents (CO_2e) are bases for reporting the three primary GHGs (e.g., CO_2, N_2O, and CH_4) in common units. Quantities are reported as "rounded" and truncated values for ease of addition.

1 Ground service equipment include the Logan Airport fleet.

2 Stationary sources include Central Heating and Cooling Plant, emergency generators, and snow melters.

3 Scope 2 emissions from electrical consumption occurs off-airport at power generating plants.

4 Aircraft – Ground emissions include taxi-in, taxi-out and ground-based delay emissions based on AEDT fuel usages.

5 Aircraft – Ground to 3,000 feet include takeoff, climb out, and approach emissions up to a height of 3,000 feet based on AEDT fuel usages.

6 Passenger and Employee Transportation includes off- and on-Airport employee/tenant/public vehicle trips.

7 Total Emissions = Airport + Tenant + Public.

8 Percentage based on relative amount of total emissions to 2019 (latest available) statewide total from MassDEP, 2nd Addendum to the Statewide Greenhouse Gas Emissions Level: 1990 Baseline Update, June 2022, available at https://www.mass.gov/doc/2nd-addendum-to-statewide-ghg-level-proposed-1990-baseline-update-june-2022/download.

9 The EPA published that: "…methane is no longer considered to be an emission from aircraft gas turbine engines burning Jet A at higher power settings and is, in fact, consumed in net at these higher powers." [Reference: EPA, Recommended Best Practice for Quantifying Speciated Organic Gas Emissions from Aircraft Equipped with Turbofan, Turbojet, and Turboprop Engines, May 27, 2009 [EPA-420-R-09-901], https://nepis.epa.gov/Exe/ZyPDF.cgi/P1003YX3.PDF?Dockey=P1003YX3.PDF.

Table 7-13 Estimated Greenhouse Gas Emissions (GHG) Inventory (in MT of CO2e) by Scope at Logan Airport, 2021

Scope	Source	CO_2	N_2O	CH_4	Totals
Scope 1 – Emissions from Sources that are Owned and/or Controlled by Massport	Massport Ground Service Equipment[1]	3,534	35	17	3,586
	Massport Shuttle Bus	1,126	8	9	1,144
	Massport Express Bus	2,383	30	1	2,415
	On-Airport Parking Lots	2,526	9	1	2,536
	Stationary Sources[2]	23,312	14	13	23,339
	Fire Training	47	1	<1	48
	Total Scope 1 Emissions (8.4%)	**32,928**	**98**	**42**	**33,067**
Scope 2 - Emissions Associated with the Generation of Electricity Consumed	Massport	2,803	15	12	2,830
	Tenant/Common Area	35,531	193	157	35,880
	Total Scope 2 Emissions (9.8%)[3]	**38,334**	**208**	**169**	**38,711**
Scope 3 - Emissions from Sources that are Public and Tenant Owned and Controlled	Aircraft – Ground[4]	105,248	856	10	106,114
	Aircraft – Ground to 3,000 feet[5]	156,040	1,269	19	157,327
	Aircraft - Engine Startup	2,997	24	4	3,025
	Auxiliary Power Units	7,770	63	9	7,843
	Ground Service Equipment	8,361	83	39	8,483
	Passenger and Employee Transportation[6]	38,470	94	33	38,597
	Total Scope 3 Emissions (81.7%)	**318,885**	**2,390**	**113**	**321,388**
Total Logan Airport Emissions (100%)[7]		**390,147**	**2,695**	**324**	**393,166**
Percent of Statewide Totals[8]		**<1.0%**	**<1.0%**	**<1.0%**	**<1.0%**

Source: Massport and CMT, 2022.

Notes: MT - metric tons of CO_2 equivalents (1 MT = 1.1 Short Tons). CO_2 equivalents (CO_2e) are bases for reporting the three primary GHGs (e.g., CO_2, N_2O, and CH_4) in common units. Quantities are reported as "rounded" and truncated values for ease of addition.

1 Ground service equipment include the Logan Airport fleet.

2 Stationary sources include Central Heating and Cooling Plant, emergency generators, and snow melters.

3 Scope 2 emissions from electrical consumption occurs off-airport at power generating plants.

4 Aircraft – Ground emissions include taxi-in, taxi-out and ground-based delay emissions based on AEDT fuel usages.

5 Aircraft – Ground to 3,000 feet include takeoff, climb out, and approach emissions up to a height of 3,000 feet based on AEDT fuel usages.

6 Passenger and Employee Transportation includes off- and on-Airport employee/tenant/public vehicle trips.

7 Total Emissions = Airport + Tenant + Public.

8 Percentage based on relative amount of total emissions to 2019 (latest available) statewide total from MassDEP, 2nd Addendum to the Statewide Greenhouse Gas Emissions Level: 1990 Baseline Update, June 2022, available at https://www.mass.gov/doc/2nd-addendum-to-statewide-ghg-level-proposed-1990-baseline-update-june-2022/download.

9 The EPA published that: "…methane is no longer considered to be an emission from aircraft gas turbine engines burning Jet A at higher power settings and is, in fact, consumed in net at these higher powers." [Reference: EPA, Recommended Best Practice for Quantifying Speciated Organic Gas Emissions from Aircraft Equipped with Turbofan, Turbojet, and Turboprop Engines, May 27, 2009 [EPA-420-R-09-901], https://nepis.epa.gov/Exe/ZyPDF.cgi/P1003YX3.PDF?Dockey=P1003YX3.PDF.

Table 7-14 provides GHG data for Logan Airport from 2018 through 2021 by scope and compares the emissions to statewide totals, in MT of CO_2e. For ease of comparison to prior year inventories, estimated total GHG emissions at Logan Airport from 2007 through 2021 are provided in Appendix I, *Air Quality/Emissions Reduction* (see **Table I-27**) and are presented in million metric tons (MMT) of CO_2e.

Table 7-14 Comparison of Estimated Total Greenhouse Gas (GHG) Emissions (MT of CO2e) by Scope at Logan Airport – 2018 through 2021

Scope	**2018**	**2019**	**2020**	**2021**
Scope 1 Emissions	47,493	51,360	32,764	33,067
Scope 2 Emissions	44,716	43,226	39,949	38,711
Scope 3 Emissions	685,465	713,539	247,530	321,388
Total Emissions[1]	**777,674**	**808,125**	**320,242**	**393,166**
Percent of State Totals[1]	1%	1%	<1%	<1%

Source: Massport and CMT, 2022.

Notes: Totals may not add exactly due to rounding.
MT – metric tons of CO_2 equivalents (1 MT = 1.1 Short Tons). CO_2 equivalents (CO_2e) are bases for reporting the three primary GHGs (e.g., CO_2, N_2O and CH_4) in common units. Quantities are reported as "rounded" and truncated values for ease of addition.

1 Total Emissions = Scope 1 + Scope 2+ Scope 3.

2 Percentage based on most recent relative amount of total emissions to statewide total from MassDEP, MassDEP, 2nd Addendum to the Statewide Greenhouse Gas Emissions Level: 1990 Baseline Update, June 2022, available at https://www.mass.gov/doc/2nd-addendum-to-statewide-ghg-level-proposed-1990-baseline-update-june-2022/download.

Greenhouse Gas (GHG) Emissions Normalized by Building Area

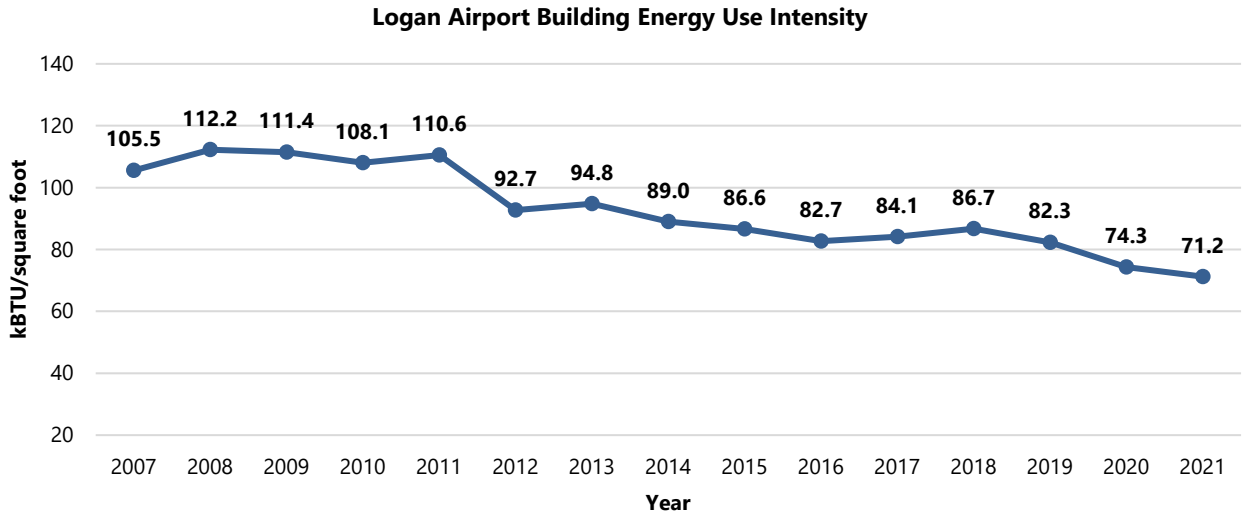
The total square footage of Logan Airport buildings has remained roughly the same in 2020 and 2021 compared to 2019. Normalizing the data by number of passengers and square feet shows that Logan Airport's energy efficiency has increased over time.

Figure 7-10 shows Logan Airport's building energy use intensity, which is a measure of energy consumption per square foot, from 2007 to 2021. Logan Airport's energy use intensity has decreased from 1,053,574,117 thousand British Thermal Unit (kBTU) in FY2020 to 1,010,379,008 kBTU in FY2021. **Figure 7-11** shows Logan Airport's building GHG emissions per square foot, which has decreased from 141,677,661 lbs CO_2e in FY2020 to 135,864,922 lbs CO_2e in FY2021. Building energy is provided from three sources: natural gas, fuel oil, and electricity, and also by diesel generators in times when back up is needed. **Figures 7-12** through **7-15** show building energy by source and building GHG emissions by source.

Figures 7-10 through **7-15** demonstrate that Logan Airport is operating more efficiently over time, shifting to cleaner fuel sources, and serving more passengers in a larger building footprint with less energy. The following Massport initiatives have contributed to this success:

- Commitment to Sustainable Design Standards and Guidelines.
- Constructing and operating facilities to LEED® standards and other sustainability-rating systems.
- Ongoing energy efficiency projects, such as converting to light-emitting diode (LED) lighting and upgrading to energy-efficient heating, ventilation, and air conditioning (HVAC) equipment.
- Installation of on-site renewable energy sources, including solar and wind.

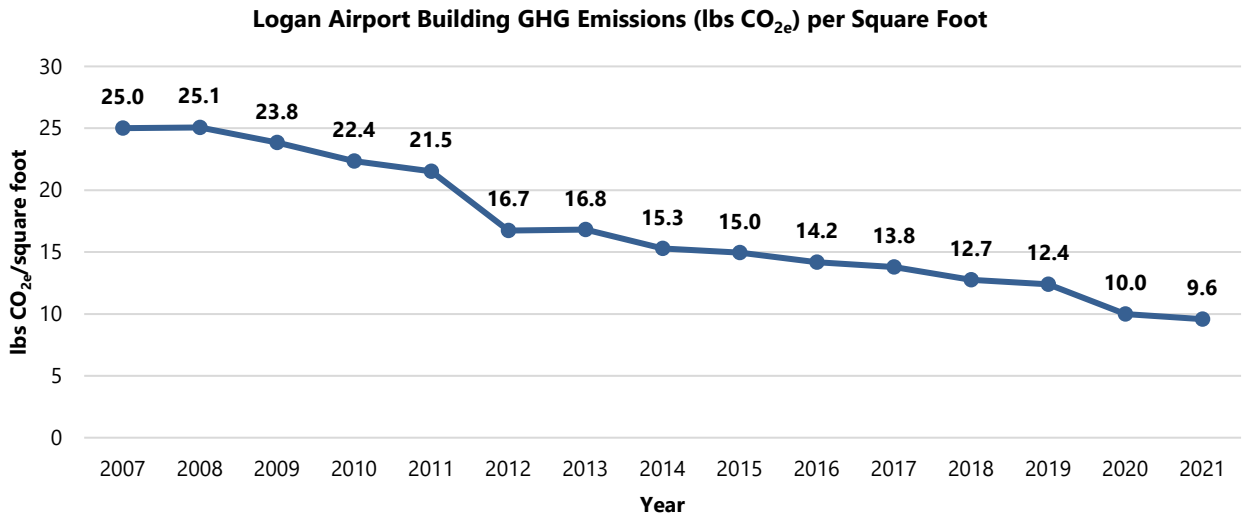
Figure 7-10 Estimated Building Energy Use Intensity (kBTU/Square Foot), FY 2007-2021



Source: Massport, 2022.

Notes: FY = Fiscal Year, and kBTU = thousand British thermal units. Electricity (and therefore energy total) has accounted for renewables by taking credit for avoided GHGs for that portion of energy. Therefore, total energy includes some energy that is generated by renewables (with the exception of those that are under Power Purchase Agreements [PPAs]), but the energy total used to calculate GHGs excludes Renewable Energy Credit (REC) purchases and non-Power Purchase Agreement (non-PPA) on-site renewable generation.

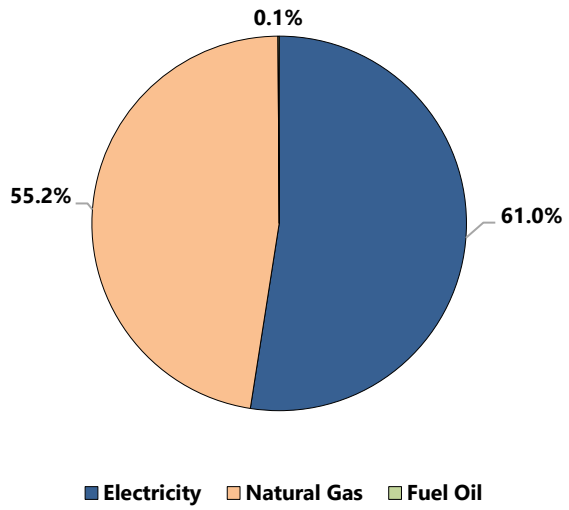
Figure 7-11 Estimated Building GHG Emissions (lbs CO_2e) per Square Foot, FY 2007-2021



Source: Massport, 2022.

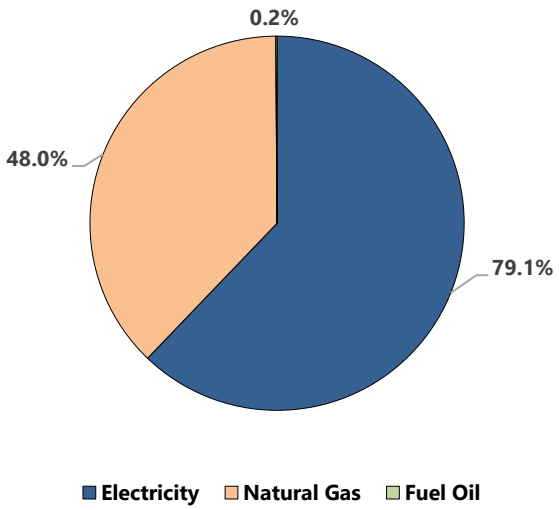
Notes: FY = Fiscal Year. Electricity (and therefore energy total) has accounted for renewables by taking credit for avoided GHGs for that portion of energy. Therefore, total energy includes some energy that is generated by renewables (with the exception of those that are under Power Purchase Agreements [PPAs]), but the energy total used to calculate GHGs excludes Renewable Energy Credit (REC) purchases and non-Power Purchase Agreement (non-PPA) on-site renewable generation.

Figure 7-12 FY 2020 Building Energy Sources



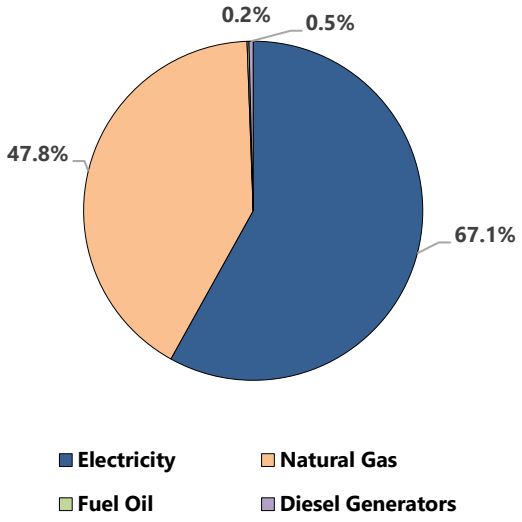
Source: Massport, 2022.

Figure 7-13 FY 2020 Estimated Building GHG Emission Sources



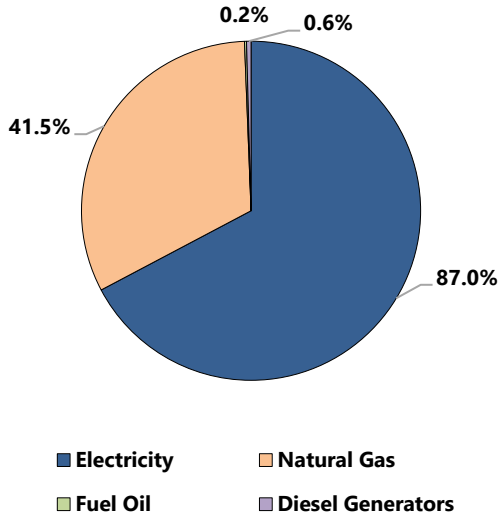
Source: Massport, 2022.

Figure 7-14 FY 2021 Building Energy Sources



Source: Massport, 2022.

Figure 7-15 FY 2021 Estimated Building GHG Emission Sources



Source: Massport, 2022.

Air Quality Emissions Reduction

As part of implementing and advancing its ongoing air quality management strategy for Logan Airport, Massport has established goals and objectives to address air emissions from Airport operations, including the minimization of Airport-related emissions through the reduction of GSE and Massport vehicle fleet emissions. This section presents an update on these initiatives at Logan Airport.

Alternative Fuel Vehicles (AFV) Program

A component of Massport's Air Quality Management Program is the AFV Program. The AFV Program is designed to replace Massport's conventionally fueled fleet with alternatively fueled or powered vehicles, when feasible, to help reduce emissions associated with Logan Airport operations. Massport operates 103 vehicles powered by CNG, propane, E85 flex fuel, diesel/electric hybrid, gasoline/electric hybrid, and plug-in electric. Massport also established a vehicle procurement policy as early as 2006 that requires consideration of AFVs when purchases are made. For example, beginning in 2013, as part of the Southwest Service Area (SWSA) redevelopment, the existing fleet of diesel rental car shuttle buses was replaced by CNG or clean diesel-electric hybrid buses. In 2017, two CNG Honda Civics were retired. The remaining seven were retired in 2019 and replaced with seven plug-in electric hybrid vehicles. The remaining CNG pick-up trucks and vans were retired in 2018.

Table 7-15 shows the number of Massport AFVs by vehicle type in 2020 and 2021. As discussed in Chapter 1, *Introduction/Executive Summary,* several projects and programs support AFVs at Logan Airport including:

- The replacement of 96 diesel rental car buses and older CNG buses with a fleet of 54 alternative fuel (diesel-electric hybrids and newer generation CNG) buses, serve the new Rental Car Center (RCC), Massport terminals, and other airport shuttle routes.
- Operation for almost two decades of one of the largest privately operated, publicly accessible, CNG stations in New England. In 2020 and 2021, the station dispensed approximately 12,339 and 10,691 gasoline-gallon equivalents per month for Massport vehicles, respectively.
- Massport has committed to increasing the availability of EV charging stations so that 150 percent of this demand is available at all facilities, at all times. Massport will continue to evaluate this as passenger activity returns. Currently, there are 253 charging ports Massport wide. Massport's charging stations include (note some stations have multiple ports):
    - 53 dual stations at Level 2
    - 19 dual stations in the Central Garage
    - 10 dual stations in the Terminal B Garage
    - One dual station at Logan Facilities 2 building
    - 10 dual stations in the Economy Garage
    - One dual station at the Taxi Pool
    - One dual station at the RideApp Lot
    - 11 dual stations in the Logan Office Center (LOC) garage

- A total of 204 eGSE are in service at Logan Airport.[40] As part of its long-range emission reduction strategy, Massport is working with the airlines to replace conventional gasoline- and diesel-powered GSE with electric alternatives.
- Continued operation of Massport's "Clean-Air-Cab" incentive program for AFVs, which allows hybrid or alternative fuel taxis to go to the head of the taxi line to serve passengers.

In addition, Logan Airport's Green Bus Depot is designed to maintain the expanded CNG-fueled and diesel-electric hybrid shuttle bus fleet. Since 2007, Massport has offered preferred parking for customers driving hybrid and AFVs.

Table 7-15 Massport's Alternative Fuel Vehicle (AFV) Fleet Inventory at Logan Airport

Fuel Type	Vehicle	2020/2021
Diesel/Electric Hybrid	Shuttle Bus[1]	32
Compressed Natural Gas (CNG)	CNG NABI Bus[2]	21
Gasoline/Electric Hybrid	Ford Escape	4
Propane	Non-Road Vehicles (Forklifts)	1
E85 Flex Fuel	Pick-Up Truck	30
	Van	2
	Ford Escape	3
Plug-in Electric Hybrid	Chevy Volt[3]	9
	Total	**103**

Source: Massport, 2022.
1 The 32 diesel/electric hybrid shuttle buses, added to the fleet in 2013, replaced the diesel rental car buses.
2 The CNG NABI buses replaced the 26 aging CNG shuttle buses.
3 The Chevy Volt plug-in electric hybrid vehicles replaced the CNG Honda Civics.

Air Quality Management Goals

Massport's air quality management strategy for Logan Airport focuses on decreasing emissions from Airport-related sources, in addition to furthering innovative means to achieve emissions reductions Airport-wide. Massport's air quality improvement goals, the measures proposed to accomplish them, and some of the 2021 milestones are listed in **Table 7-16**. Massport continues to comply with the Logan Airport Parking Freeze,[41] in accordance with 10 Code of Massachusetts Regulations 7.30 and 40 Code of Federal Regulations 52.1135. Chapter 5, *Ground Access to and from Logan Airport,* provides detailed discussion of Massport's compliance with the Parking Freeze regulation, and the counterproductive effect of constrained parking at Logan Airport on VMT and associated emissions.

40 Based on Massport's 2021 Vehicle Aerodrome Data for Logan Airport.
41 310 Code of Massachusetts Regulations 7.30 and 40 Code of Federal Regulations 52.1120.

Table 7-16 Air Quality Management Strategy Status

Air Quality Emissions Reduction Goals	Plan Elements	2021 Status
Reduce emissions from Massport fleet vehicles	Convert Massport fleet vehicles to electricity by retrofitting or procurement.	Massport is facilitating the replacement of gas- and diesel-powered ground service equipment (GSE) with all-electric versions. All GSE at the Airport will be replaced by electric equivalents, as commercially available. The U.S. Environmental Protection Agency (EPA) awarded a $541,817 grant in 2018 to Massport under the Diesel Emission Reduction Act (DERA) to replace gas- and diesel-powered GSE at Logan Airport in a collaborative effort to reduce emissions and improve air quality. American Airlines will contribute the entire match and Massport will provide support in the way of grant administration and data tracking. This grant will allow Massport to replace 25 pieces of diesel-powered GSE with all-electric versions. This grant will be used in conjunction with a Federal Aviation Administration (FAA) grant Massport received in the fall of 2018 to install electric GSE (eGSE) charging stations for the Terminal B Optimization Project. Additionally, in 2019 Massport was awarded by the EPA under DERA a $990,000 grant to replace 44 diesel-powered GSE equipment with all-electric baggage tractors, belt loaders, and push back tugs. GSE owners at Logan Airport will contribute a $1,210,000 match.[1] In 2018, Massport was awarded an FAA Voluntary Airport Low Emission (VALE) Program grant of $1,600,000 for charging infrastructure at Terminal B. Massport contributed $626,000 in matching funds to install 50 eGSE charging stations. In 2019, through the same program, Massport was awarded $3,200,000 for charging infrastructure at Terminal C. Massport contributed $953,000 toward the installation of 42 eGSE charging stations. Massport, in partnership with jetBlue, was awarded $445,000 in 2019 through the Massachusetts Department of Environmental Protection's (MassDEP's) Volkswagen Diesel Settlements & Environmental Mitigation Open Solicitation grant program. The grant, aimed at reducing nitrogen oxide (NO_X) and greenhouse gas (GHG) emissions, will support the replacement of 31 pieces of GSE with new eGSE and install four eGSE charging stations at Terminal C. United Airlines also privately pursued this grant and was awarded $280,000. In 2020, Massport was awarded a grant through FAA's VALE for charging infrastructure at Terminal E and Signature Aviation Building 14 to install 10 eSGE charging stations. Massport is also collaborating with the Massachusetts Clean Energy Center (MassCEC) to study opportunities to enable conversion of the ride-for-hire fleet (RideApp, Rental Car Taxi and limousine vehicles) that serves Logan to transition to electric vehicles. In early 2022, MassCEC provided a grant to initiate this work and provide some funding to increase Logan's electrical vehicle (EV) charging infrastructure.

Table 7-16 Air Quality Management Strategy Status (Continued)

Air Quality Emissions Reduction Goals	Plan Elements	2021 Status
Encourage use of alternative fuel and alternative power vehicles by private fleet and airside service vehicle owners	Provide infrastructure to support alternative fuels including CNG and electricity.	Massport continues to operate one of New England's largest retail compressed natural gas (CNG) stations, which is open to the public. In 2020 and 2021, the CNG station supplied an average of 12,339 and 10,691 gasoline-gallon equivalents per month, respectively, for Massport fleet vehicles (non-Massport vehicles were also using CNG). Massport continues to install infrastructure supporting the use of plug-in EVs. At the time of this EDR there are 123 landside EV charging ports installed at Logan Airport and more at the Logan Express sites.
Encourage use of alternative fuel and alternative power vehicles by private fleet and airside service vehicle owners	Work with ground access fleet and airside service-vehicle owners to encourage conversion.	Massport encourages conversion to alternative fuel vehicles/alternative power vehicles (AFVs/APVs) by others through such policies as 50-percent discounts in AFV/APV ground access fees to limousines, vans, and buses; and preferred parking for hybrid and AFVs/APVs at Logan Airport parking facilities.
Minimize emissions from motor vehicles	Implement a program to increase high occupancy vehicle (HOV) ridership by air passengers.	As described in detail in Chapter 5, *Ground Access to and from Logan Airport,* there are a number of HOV services serving Logan Airport that are aimed at air passengers, including the Massachusetts Bay Transportation Authority (MBTA) Blue Line and Silver Line, Logan Express, and water transportation. Massport promotes the use of these services by employees and passengers, primarily through various pricing incentives. Massport has developed a robust strategy to increase HOV options and use. More information about this strategy can be found in Chapter 5, *Ground Access to and from Logan Airport*. Massport provides free, clean-fuel shuttle bus service for passengers and employees between the MBTA Blue Line Airport Station, all terminals, the Rental Car Center (RCC), and the Logan Airport water transportation dock along Harborside Drive.
	Expand the Logan Transportation Management Association (TMA) for Airport employees.	Massport continues to provide commuting information to all Airport employees including Sunrise and Logan Express Shuttles with reductions in employee parking. Logan Express extended service now provides nearly 24-hour service at several Logan Express locations, with significant discounts provided to Airport-wide and Massport employees. Since the pandemic-related service adjustments in 2020 and 2021, Massport continues to restore, adjust, and augment HOV services.
	Encourage employees to use bicycling as a mode of commuting.	Massport includes bike racks or posts for securing bikes at all new facilities and at appropriate existing facilities to promote employees biking to work. Bicycle racks or posts for securing bikes are currently provided at the RCC, Terminal A, Terminal E, Logan Office Center, MBTA's Airport Station, Economy Parking Garage, Signature general aviation facility, and the Green Bus Depot (Bus Maintenance Facility, for authorized personnel).

Table 7-16 Air Quality Management Strategy Status (Continued)

Air Quality Emissions Reduction Goals	Plan Elements	2021 Status
Minimize emissions from Construction Equipment	Incorporate Clean Air Construction Initiative (CACI) into major earthwork construction projects.	For all large construction projects, heavy construction equipment is required to be equipped with diesel particulate filters or diesel oxidation catalysts in accordance with CACI.
Reduce emissions from fuel vapor loss	Provide state-of-the-art fuel storage and distribution equipment.	The Fuel Storage and Distribution System is in operation.
	Implement Tank Management Program.	Refer to Chapter 8, *Environmental Compliance and Management/ Water Quality,* which provides details regarding tank management focuses on proper maintenance.
Reduce emissions from stationary sources	Employ Reasonable Available Control Technologies (RACT) for NO_X at Central Heating and Cooling Plant.	RACT policies have been implemented. Studies are underway to evaluate further opportunities to reduce CHP emissions.
	Use alternative fuels in snow melters.	Massport is required to use Ultra Low Sulfur Diesel (ULSD) fuel in all Massport snow melting equipment. Massport installed two new stationary snow melters using natural gas in 2016 and two additional snow melters became operational in December 2019. These installations will reduce the need for ULSD fuel fired portable snow melters. In 2020, one new ULSD portable snow melter was added to the fleet.
	Incorporate green building technologies and energy use reduction strategies.	Logan Airport has eight U.S. Green Building Council (USGBC)'s Leadership in Energy and Environmental Design (LEED®) certified facilities: Terminal A (the first LEED® certified terminal in the world), the Signature Flight Support General Aviation (GA) Facility, the Green Bus Depot (LEED® Silver), the RCC (LEED® Gold), the Terminal E New Lage Aircraft Wing (LEED® Gold), Terminal B Gates 37-38 (LEED Gold), Nouria Service Center (LEED® Silver), and the Terminal B Optimization (LEED® Silver). An overview of sustainability initiatives is presented in Chapter 1, *Introduction/Executive Summary*.
Reduce emissions from stationary sources	Install diesel particulate filters on large emergency generators	Massport has voluntarily installed diesel particulate filters on all large (>500 kilowatts) stationary emergency generators beginning in 2011.
Reduce aircraft emissions	Work with FAA to study and implement airfield-improvement concepts and operational changes that may have air quality benefits.	Massport promoted such concepts through the *Logan Airside Improvements Planning Project Environmental Impact Statement*, which recommended physical and operational improvements to Logan Airport including construction of the new Runway 14-32 and Centerfield Taxiway, and taxiway improvements. Runway 14-32 became operational in November 2006 and the Centerfield Taxiway was fully opened in summer of 2009. In addition, in coordination with Massport, the Massachusetts Institute of Technology (MIT) completed a detailed survey of pilots at Logan Airport to

Table 7-16 Air Quality Management Strategy Status (Continued)

Air Quality Emissions Reduction Goals	Plan Elements	2021 Status
Reduce aircraft emissions (Continued)	Work with FAA to study and implement airfield-improvement concepts and operational changes that may have air quality benefits. (Continued)	better understand the use of single engine taxiing and issued a paper in March 2010, and in January 2011, MIT published a paper on aircraft pushback control strategies to reduce congestion and taxi delay. In addition to airside improvements including Midfield Taxiway and the MIT study on single engine taxiing, Massport continues to: - Promote single engine taxiing directly to chief pilots and airlines when safe. - Collaborate with MIT on national research on reducing departure queues on the airfield. Logan Airport related work is complete and is now being tested at other airports. - Conduct a runway incursion mitigation study to include potential for holding pads at appropriate locations to reduce aircraft queues at runway ends (and closer to communities). - Manage an engine run up location at the end of Runway 14-32 away from communities.
Reduce aircraft emissions	Use of pre-conditioned air (PCA) at new and renovated terminals and terminal gates.	All contact gates have pre-conditioned air and/or 400-Hz power. This reduces the time-in-mode (TIM) of auxiliary power unit (APUs), and consequently reduces associated emissions. The recent improvements of Terminal B and the Terminal B-C Connector project included the installation of pre-conditioned air at all renovated gates.
Reduce energy intensity and greenhouse gas (GHG) emissions while increasing portion of Logan Airport's energy generated from renewable sources	Reduce energy consumption Increase the portion of Massport's energy being generated from renewable sources Reduce overall GHG emissions associated with energy consumed in Massport operated facilities at Logan Airport Reduce GHG emissions from Massport-operated mobile sources	This goal was identified as part of the Logan Airport Sustainability Management Plan (SMP)[2], which was released in April 2015. In the 2018 Annual Sustainability & Resiliency Report, Massport identified several policies and initiatives its implementing to achieve this goal, including pursuing LEED® accreditation for new projects and upgrading to energy-efficient heating, ventilation, and air conditioning (HVAC) systems. As of FY2017, Massport had achieved a 46 percent reduction in GHG emissions per passenger, exceeding its 2020 target by about 6 percent. Massport also reduced its energy use per passenger by 26 percent and energy use per square foot by 25 percent, reaching its goal of a 25-percent reduction by 2020. Progress on this goal will be reported in future sustainability reports.

Source: Massport, 2022.

1 EPA, "National DERA Awarded Grants," https://www.epa.gov/dera/national-dera-awarded-grants.

2 Progress towards goals identified as part of the Logan Airport Sustainability Management Plan (SMP) will be reported separately, as part of Massport's annual sustainability reporting.

Updates on Other Air Quality Efforts

This section further highlights updates on other Logan Airport-related air quality efforts in 2021 and current studies on aviation-related air quality and public health issues.

Massachusetts Department of Public Health Study

In 2004, the Massachusetts Legislature appropriated funds for the Department of Public Health (DPH) to undertake an assessment of potential health impacts of Logan Airport in the East Boston section of the city and any other communities located within a five-mile radius of the Airport, with a focus on noise and air quality. This study was completed in May 2014 and consisted of an epidemiological survey combined with computer modeling of noise levels and air pollution concentrations. Massport has cooperated in this effort by providing funding to complete the study and Airport operational data in support of the study. In the spring of 2011, Massport also gave technical assistance in support of the DPH study by providing geographic information systems (GIS) analysis of the roadway network in and around Logan Airport in a format compatible with FAA's EDMS. Massport is working with DPH and the East Boston Neighborhood Health Center on implementing DPH recommendations related to Massport.

In response to the DPH study recommendations, Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.

The findings from this study can be viewed from DPH website at:
http://www.mass.gov/eohhs/docs/dph/environmental/investigations/logan/logan-airport-health-study-final.pdf.

Recent Studies on Impacts of Aviation Emissions on Air Quality and Public Health

Massport continues to stay apprised on studies regarding impacts of aviation on air quality and public health. A recent study conducted by Tufts University*, Impacts of Aviation Emissions on Near-Airport Residential Air Quality,*[42] examined CO, CO_2, NO, NO_2, $PM_{2.5}$, UFPs, and BC at a residence near Logan Airport. The residence was located under a flight trajectory of the most utilized runway configuration. The study showed that gaseous and particulate pollutant concentrations were higher at the residence when it was downwind compared to when it was not.

Olin College is collaborating with Air Inc. and the Town of Winthrop to monitor air quality in the community. Monitors were placed in Winthrop to continuously measure pollutants such as CO, CO_2, nitric oxide (NO), NO_2, and O_3, as well as the mass concentration of $PM_{2.5/10}$, and all relevant meteorological conditions. This study is ongoing and Massport will continue to provide operational data and collaborate as-needed.

Additionally, as discussed in previous sections, the University of Southern California and the University of Washington conducted two recent studies. The study performed by the University of Southern California, indicated that there could be adverse health effects following exposure to airport and roadway traffic-related UFPs

42 Neelakshi Hudda et al, "Impacts of Aviation Emissions on Near-Airport Residential Air Quality," Environ. Sci. Technol. 2020, 54, 8580−8588, doi.org/10.1021/acs.est.0c01859.

near Los Angeles International Airport. The study led by the University of Washington was conducted to understand the air quality impacts of air traffic for communities located near and below the flight paths of Seattle-Tacoma International Airport. The findings show key differences exist in the particle size distribution and the BC concentration for roadway and aircraft features.

Single Engine Taxiing

Single engine taxiing is one measure that is being used by air carriers to help reduce fuel use and emissions. As a result, Massport supports the use of single engine taxiing when it can be done safely, voluntarily, and at the discretion of the pilot. Massport has conducted three surveys of Logan Airport air carriers (2006, 2009, and 2010) to understand the extent single engine taxiing is used at Logan Airport. In addition, Massport was an active member of the FAA Partnership for Air Transportation Noise and Emissions Reduction (PARTNER) program on reducing noise and emissions.[43] In 2009, Massport offered to facilitate a more detailed survey of pilots at Logan Airport by MIT to better understand the use of single engine taxiing. MIT completed its survey and issued a paper in March 2010, which was provided in the *2009 EDR*. The MIT survey confirms earlier Massport survey findings that single engine taxiing is an important operational measure used by airlines to conserve fuel and is extensively used at Logan Airport. MIT issued a paper in January 2011 reporting on a control strategy to minimize airport surface congestion, and thus taxiing time, by regulating the rate at which aircraft are pushed back from their gates. Massport continues to support the practice of single/reduced-engine taxiing and the use of idle reverse thrust.

MIT and the Center for Air Transportation Systems Research developed a methodology to account for single engine taxi procedures during the taxi-in or -out modes.[44,45,46] Some of the single engine taxi challenges noted in these studies include: (1) excessive thrust and associated issues; (2) maneuverability problems particularly related to tight taxiway turns and weather; (3) problems starting the second engine; and (4) distractions and workload issues. Thus, pilots do not use single engine taxiing during each aircraft operation in practice, and when they do use it, it is not for the entire operation. Pilots use single engine taxiing even less often when taxiing out.

When applying the MIT methodology and available data (such as aircraft pilot surveys) to the most recent set of aircraft operational data for Logan Airport (i.e., 2020 and 2021), the results show a savings of approximately 1,006,824 gallons in 2020 and 1,315,105 gallons in 2021 of jet fuel. This translates to a reduction of approximately 9,897 and 12,927 metric tons of GHG emissions associated with this initiative in 2020 and 2021, respectively.

43 The Partnership for AiR Transportation Noise and Emissions Reduction (PARTNER) — was a leading aviation cooperative research organization headquartered at the Massachusetts Institute of Technology (MIT). An FAA Center of Excellence, PARTNER was sponsored by the FAA, NASA, Transport Canada, the U.S. Department of Defense, and the EPA. In December 2015, PARTNER completed its Center of Excellence mandate and research. The ASCENT FAA Center of Excellence is now conducting similar research. Currently Massport is a member of the ASCENT Advisory Committee.

44 Massachusetts Institute of Technology. 2010. *A Survey of Airline Pilots Regarding Fuel Conservation Procedures for Taxi Operations*.

45 Massachusetts Institute of Technology. 2008. *Opportunities for Reducing Surface Emissions through Airport Surface Movement Optimization*.

46 Center for Air Transportation Systems Research. *Analysis of Emissions Inventory for Single Engine Taxi-out Operations*. 2009.

Engagement in Aviation-Related Environmental Issues

Massport maintains memberships and active participation in organizations that address aviation-related environmental issues, including air quality. These include environmental committees for TRB, the American Association of Airport Executives (AAAE), and the Airports Council International-North America (ACI-NA).

Black Carbon (BC)

Particulate matter at all sizes is comprised of multiple components, one of the more significant being BC. BC particles, also referred to as soot, form because of incomplete combustion, particularly at the higher temperatures at which aircraft burn fuel, making BC emissions common from aircraft. BC from aviation activities largely contribute to smaller particulate matter particles (i.e., $PM_{2.5}$ and UFPs). $PM_{2.5}$ is classified as a criteria air pollutant by EPA and regulated by NAAQS.

BC is known to have negative impacts on both human health and the environment. According to EPA, BC is associated with respiratory distress, cardiovascular disease, cancer, and birth defects. A 2009 study using air quality monitors near an airport showed that airports can contribute from 24 to 28 percent of total BC within 4 kilometers.[47] However, modeling studies, commonly used to ascertain the extent of impacts on human health and the environment, have shown the level of contribution by an airport to be less, only on the order of 2 to 5 percent. Researchers are working on understanding the reasons for this discrepancy. It may be an indication that emissions estimates from airports need improvement.[48] A very recent study (September 2022) states that due to the complexity and cost of the instrumentation and the lack of reference modeling protocol, data availability on BC is limited.[49]

To fully understand the extent of impacts from airport-related BC emissions, much more research is needed. It is important for research to focus on improving emissions estimates of BC from airports and improved modeling studies. In addition to the EPA and other performing BC related studies, the FAA also conducts BC research through the ASCENT program.

Climate Change Adaptation and Resiliency

Massport has a comprehensive resiliency initiative to maximize business continuity amid various human and natural threats. Massport's efforts are guided by the following goals:

- Improve resiliency for overall infrastructure and operations.
- Restore operations during and after disruptive events in a safe and economically viable time frame.
- Create robust feed-back loops that allow new solutions as conditions change.
- Inform operations and policy, and implement design/build decisions, through the application of sound scientific research and principles that consider threats, vulnerabilities, and cost-benefit calculations.

47 Dodson R. E.; Houseman E. A.; Morin B.; Levy J. I. 2009. *An analysis of continuous black carbon concentrations in proximity to an airport and major roadways.* Atmos. Environ, 43243764–3773.

48 Arunachalam S.; Valencia A.; Yang D.; Davis N, Baek B.H.; Dodson R.E.; Houseman A.E.; Levy J.I. 2011. *Comparing Monitoring-Based and Modeling-Based Approaches for Evaluating Black Carbon Contributions from a US Airport.* Air Pol. Mod, 619-623.

49 J.Rovira; J.A.Paredes-Ahumada; J.M.Barceló-Ordinas; J.García-Vidal; C.Reche; Y.Sola; P.L.Fung; T.Petäjä; T.Hussein; M.Viana; September 2022. *Non-linear Models for Black Carbon Exposure Modelling Using Air Pollution Datasets.* Environmental Research Volume 212, Part B.

- Become a knowledge-sharing exemplar of a forward-thinking, resilient port authority.
- Work with key influencers and decision makers to strengthen understanding of the human, national, and economic security implications of extreme weather, changing climate, and anthropogenic threats to Massport's facilities and the region.

Statewide, National, and International Initiatives

Advancements on the national and international levels to decrease Airport-related air emissions have continued to focus primarily on three initiatives: the advanced quantification of particulate matter and hazardous air pollutants (HAPs) emissions from aircraft engines; the continued phasing-in of AFV; and the implementation of GHG emissions reduction strategies. These initiatives are briefly described below.

- **Particulate Matter and Hazardous Air Pollutant Research** – Conducted by the ICAO, FAA, EPA, and others, research continues to better characterize PM_{10}/$PM_{2.5}$ and HAPs emissions (including Pb) from aircraft engines. Similarly, air quality monitoring efforts at other airports were also conducted at various locations to advance what are known about ambient levels of these air pollutants in the vicinities of airports. Massport continues to closely track these issues through its involvement in aviation industry organizations such as ACI-NA and AAAE.
- **AFV Conversions** – Airlines and other GSE users are continually replacing their older fossil-fueled vehicles and equipment with more fuel-efficient, low- and non-emitting (e.g., electric) technologies. Airport-fleet vehicles are also being converted to alternative fuels (e.g., electric, propane). In response, GSE and automobile manufacturers are offering a wider selection of AFVs, many of which are designed specifically for airport use. Massport continues to support the conversion of fossil-fueled vehicles and equipment to alternative, electric, or lower-emitting fuels. Massport is replacing all commercially-available diesel-powered GSE to all-electric. In 2018, EPA awarded a $541,817 grant under the Diesel Emission Reduction Act (DERA) to Massport to replace gas- and diesel-powered GSE at Logan Airport in a collaborative effort to reduce diesel emissions and improve air quality. This grant will allow Massport to assist American Airlines with the replacement of 25 pieces of diesel-powered GSE with all-electric versions. This grant will be used in conjunction with an FAA grant Massport received in the fall of 2018 to install eGSE charging stations for the Terminal B Optimization Project. In 2019, Massport was awarded by EPA under DERA a $990,000 grant to replace 44 diesel-powered GSE with all-electric baggage tractors, belt loaders, and push back tugs. Massport contributed a $1,210,000 match. Massport is also collaborating with the MassCEC to study opportunities to enable conversion of the ride-for-hire fleet (RideApp, Rental Car Taxi and limousine vehicles) that serves Logan to transition to electric vehicles. In early 2022, MassCEC provided a grant to initiate this work and provide some funding to increase Logan's EV charging infrastructure.
- **Sustainable Aviation Fuel (SAF)** – International Air Transport Association (IATA) approved a resolution for the governments to continue in implementing the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA). To achieve a carbon-neutral growth, this initiative sets a cap on net CO_2 emissions generated from international aviation at 2020 levels. Airlines are also encouraged to use biofuels, or other sustainable aviation fuels, as a fuel efficiency measure.[50] In May 2019, United Airlines

50 Biofuels international, IATA resolution urges airlines to switch to sustainable aviation fuels. June 3, 2019, https://biofuels-news.com/display_news/14744/iata_resolution_urges_airlines_to_switch_to_sustainable_aviation_fuels/.

agreed to purchase up to 10 million gallons of cost-competitive, commercial-scale, sustainable aviation biofuel over the next two years. Currently, every United Airlines flight out of Los Angeles International Airport are powered by biofuel. United Airlines has renewed its contract with Boston's World Energy, a biofuel producer, to help achieve its commitment to reducing its GHG emissions by 50 percent by 2050.[51] In September 2021, jetBlue announced plans to speed up its transition to SAF with an offtake agreement with SG Preston, a leading bioenergy developer. With the addition of this SG Preston agreement to its previous SAF commitments, jetBlue is well ahead of the pace on its target to convert 10 percent of its total fuel usage to SAF on a blended basis by 2030. The airline will reach nearly 18 percent SAF usage by the end of 2023 when delivery of SAF under this agreement is expected. jetBlue is doubling its previous SAF commitment with SG Preston, which was first announced in 2016 as one of the largest SAF purchase agreements in aviation history.[52]

- **Net Zero Roadmap by 2031** - In 2021, Massport prepared the *Net Zero Roadmap by 2031*, the goal of which is to strive to reach net zero GHG emissions by 2031 for sources that are under the control of Massport. Information on the Roadmap can be found at https://www.massport.com/massport/about-massport/roadmap-to-net-zero/. To reach this ambitious goal of achieving Net Zero GHG, Massport is evaluating a number of options, these include:
  - Improving energy efficiency in buildings;
  - Investing in EVs while increasing demand for HOV transportation;
  - Transitioning to renewable energy and finding ways to generate more of it on site;
  - Acquiring renewable energy credits, renewable identification numbers, and carbon offsets as a transition strategy for the fossil fuel sources; and
  - Placing sustainability and innovation at the center of operations and capital planning.
- **Climate Change Technology Standards**[53] – In October 2010, the 37th Assembly (Resolution A37-19) requested the development of an ICAO CO_2 emissions standard. Following six years of development, ICAO's Committee on Aviation Environmental Protection (CAEP) at its tenth meeting recommended an airplane CO_2 emissions certification standard. This new standard is part of the ICAO "Basket of measures" to reduce GHG emissions from the air transport system, and it is the first global technology standard for CO_2 emissions for any sector with the aim of encouraging more fuel-efficient technologies into airplane designs. After adoption by the ICAO Council, the new airplane CO_2 emissions certification standard was published as an official CO_2 standard in 2017. The CO_2 standard applies to subsonic jet and turboprop airplanes that are "new type" designs from 2020. It also applies to "in-production" airplanes from 2023 that are modified and meet a specific change criterion. This is subsequently followed up by a production cut-off in 2028, which means that in-production airplanes that do not meet the standard can no longer be produced beyond 2028 unless the designs are modified to comply with the standard.

51 Good News Network, As Only US Airline to Use Biofuel on Regular Basis, All United Flights from LA Are Now Powered by Biofuel. June 10, 2019. https://www.goodnewsnetwork.org/united-airlines-flights-from-la-powered-by-biofuel/.

52 *jetBlue Accelerates Transition to Sustainable Aviation Fuel (SAF) With Plans for the Largest-Ever Supply of SAF in New York Airports for a Commercial Airline*, Sep 29, 2021, http://mediaroom.jetblue.com/investor-relations/press-releases/2021/09-29-2021-132310033.

53 International Civil Aviation Organization, Environmental Protection, "Climate Change Technology Standards," 2020. https://www.icao.int/environmental-protection/Pages/ClimateChange_TechnologyStandards.aspx.

8

Environmental Compliance and Management/ Water Quality

The Massachusetts Port Authority's (Massport's) approach to environmental management and compliance is a key component of its commitment to sustainability and responsible stewardship at Boston Logan International Airport (Logan Airport or the Airport) (refer to Chapter 1, *Introduction/Executive Summary,* for details). Through monitoring and documentation, Massport assesses environmental performance, continually developing, implementing, evaluating, and striving to improve policies and programs.

Key Findings for 2020 and 2021

- Massport promotes appropriate environmental practices through pollution prevention and remediation measures. Massport also works closely with tenants and operations staff at Boston Logan International Airport (Logan Airport or the Airport) in an effort to continuously improve environmental compliance.
- In 2020, 100 percent of Massport's stormwater samples were in compliance with National Pollutant Discharge Elimination System (NPDES) permit requirements and in 2021, 99 percent were in compliance.
- Massport annually updates and maintains its Stormwater Pollution Prevention Plan (SWPPP) for Logan Airport.
- Massport continues to assess, remediate, and bring its Massachusetts Contingency Plan (MCP) sites to regulatory closure.
- In 2020, there were four reportable spills with two storm drains impacted. In 2021, there were four reportable spills with no storm drains impacted.

Introduction

In October 2000, the Massport Board approved a Massport-wide Environmental Management Policy, which articulates the agency's commitment to protect the environment and to implement sustainable design principles:

> *"Massport is committed to operate all of its facilities in an environmentally sound and responsible manner. Massport will strive to minimize the impact of its operations on the environment through the continuous improvement of its environmental performance and the implementation of pollution prevention measures, both to the extent feasible and practicable in a manner that is consistent with Massport's overall mission and goals."*

Massport's overall environmental compliance and management efforts include:

- Environmental inspections and recommendations to rectify identified issues;
- Annual updates of the Logan Airport Stormwater Pollution Prevention Plan (SWPPP) and training for personnel responsible for implementing activities identified in the SWPPP;
- Development of sustainable design standards and guidelines (SDSGs) for architects, engineers, and planners; and
- Implementation of a Spill Prevention Control and Countermeasure (SPCC) plan for Logan Airport facilities that store petroleum products.

These efforts help achieve the following goals to:

- Protect water quality Airport-wide;
- Protect groundwater resources;
- Protect surface waters (Boston Harbor) and coastal resources adjacent to the Airport;
- Minimize air quality impacts;[1]
- Protect environmental resources during construction;
- Mitigate construction impacts; and
- Reduce occurrences of fuel leaks and spills.

Massport is responsible for complying with applicable state and federal environmental laws and regulations. This chapter reports on Massport's environmental programs pertaining to environmental compliance and management and water quality, which include:

- Implementing the Sustainability Management Plan (SMP);
- Enhancing water quality and stormwater management;
- Tracking fuel use and spills;
- Managing storage tanks management and complying with regulations; and
- Assessing and remediating sites pursuant to the Massachusetts Contingency Plan (MCP).

1 Air quality conditions are reported in Chapter 7, *Air Quality/Emissions Reduction.*

Table 8-1 provides a progress report of environmental compliance and management efforts in 2020 and 2021. The progress report summarizes Massport's mechanisms for implementing its environmental management goals and details where changes to these efforts occurred.

Table 8-1 Progress Report for Environmental Compliance and Management

Plan Elements	Progress Report for 2020 and 2021
Environmental Compliance Inspections	In 2020 and 2021, Massport performed tenant inspections at a number of its National Pollutant Discharge Elimination System (NPDES) co-permittees' (Logan Airport tenants) leaseholds and made recommendations on how to remedy issues identified during the inspections.
Environmental Management System (EMS) and International Organization for Standardization (ISO) 14001	ISO 14001 certification began for Facilities II (vehicle maintenance, landscaping, snow removal, and vehicle storage) in December 2006. In 2010, Massport expanded the Logan Airport EMS to include Facilities I (Central Heating and Cooling Plant, and heating, ventilation, and air conditioning [HVAC]) and Facilities III (electrical, structural, Central Stockroom, fuel island, and sign shop). The most recent certification audit took place in June 2019, and a certificate was issued in July 2019, which is valid through July 2020. The EMS and ISO 14001 Program has been discontinued.
Stormwater Pollution Prevention Plan (SWPPP)	In accordance with the requirements of the current NPDES stormwater permit for Logan Airport issued on July 31, 2007, Massport and its co-permittees were required to develop SWPPPs. Massport completed its SWPPP in December 2007 with annual updates since that time. An application for permit renewal was submitted to the U.S. Environmental Protection Agency (EPA) and the Massachusetts Department of Environmental Protection (MassDEP) in January 2012. The permit application was determined to be administratively complete and the 2007 permit remains in effect until the renewed permit is issued. The most recent update to the SWPPP was completed in December 2021 and distributed to Massport and its stormwater co-permittees at its annual update meeting. The Logan Airport SWPPP addresses stormwater pollutants including deicing and anti-icing chemicals, bacteria, fuel and oil, and other sources of stormwater pollutants. Best management practices (BMPs) specific to aviation activities are included in the SWPPP. In accordance with the other requirements of the NPDES permit, Massport conducts training for personnel responsible for implementing activities identified in the SWPPP. The 2020 and 2021 Annual Certificates of Compliance were submitted jointly to the EPA and MassDEP in December 2020 and December 2021, respectively, by Massport and the co-permittees.

Table 8-1 Progress Report for Environmental Compliance and Management (Continued)

Plan Elements	Progress Report for 2020 and 2021
Design and Construction	Massport developed Sustainable Design Standards and Guidelines (SDSGs) for use by architects, engineers, and planners for Massport capital improvement projects in 2009.[1] The SDSGs are designed to evolve over time and foster innovation yet include clear targets to achieve more sustainable and resilient project design and practices. In addition to the SDSGs, Massport aims to construct buildings at Logan Airport to achieve U.S. Green Building Council's (USGBC's) Leadership in Energy and Environmental Design (LEED®) Silver certification or higher. Massport requires contractors to comply with the EPA Construction General Permit for all construction projects impacting one or more acres. For smaller projects, Massport requires compliance with the BMPs in the Logan Airport SWPPP. For all construction projects, Massport requires the use of ultra-low-sulfur diesel fuel in construction equipment, recycling of all construction waste to the maximum extent possible, and construction equipment retrofits with pollution control devices such as diesel oxidation catalysts and/or particulate filters. In 2022, Massport initiated preparation of an update for the SDSGs. Status of the revised document will be provided in the *2022 Environmental Status and Planning Report* (ESPR).
Spill Prevention Control and Countermeasure (SPCC) Plans[2]	Massport maintains a SPCC plan for its facilities that store petroleum products. Tenants meeting certain thresholds are required to prepare their own SPCC plans for their facilities. Massport checks for SPCC plans during environmental compliance inspections. Additionally, tenants receive information on Massport BMPs, which focus on spill management and prevention.

Source: Massport.
1 More information on the SDSGs is provided in Chapter 1, *Introduction/Executive Summary*.
2 In accordance with the Clean Water Act, 40 Code of Federal Regulations 112, Oil Pollution Prevention.

Logan Airport Sustainability Management Plan (SMP)

In 2015, Massport completed the Logan Airport SMP through a grant awarded by the Federal Aviation Administration (FAA). The SMP is integrated with the existing Environmental Management System (EMS) framework to promote environmental, social, and economic improvement. The completion of the SMP demonstrates Massport's leadership and commitment to a sustainable future for Logan Airport and its surrounding communities. The plan builds on Massport's rich history of advancing sustainability and serves as a roadmap for prioritizing initiatives and moving goals forward. The SMP is intended to guide Massport's sustainability practices and supports Massport's ongoing commitment to environmental stewardship.

The SMP represents the combined efforts of over 125 employees and tenants who came together to establish Massport's baseline sustainability performance, shape goals, and identify new sustainability initiatives. Massport is focused on a holistic approach with an emphasis on economic viability, operational efficiency, natural resource conservation, and social responsibility. As part of the SMP process, Massport developed a sustainability mission statement:

> *"Massport will maintain its role as an innovative industry leader through continuous improvement in operational efficiency, facility design and construction, and environmental stewardship while engaging passengers, employees, and the community in a sustainable manner."*

Massport published the *2019 Annual Sustainability and Resiliency Report*. The report highlights achievements and progress toward Massport's sustainability goals and targets since the release of the SMP in 2015. Massport has achieved three sustainability targets for energy use per square foot, energy use per passenger, and greenhouse gas emissions (GHG) per passenger. Massport has also enhanced 100 percent of its critical assets at Logan Airport with resiliency measures. The Annual Sustainability and Resiliency Reports were suspended for 2020 and 2021 though work on those programs continued. A new report is forthcoming in 2022.

Massport has published seven consecutive Sustainable Massport calendars (2015 through 2021), which highlight Massport's sustainability achievements. Massport's most recent Annual Sustainability and Resiliency Reports and Sustainable Massport calendars can be viewed on Massport's website at the following address: http://www.massport.com/massport/business/capital-improvements/sustainability/sustainability-management/.

Water Quality and Stormwater Management in 2020 and 2021

Massport's primary water quality goal is to prevent or minimize pollutant discharges in stormwater, thus limiting adverse water quality impacts associated with Airport activities to Boston Harbor. Massport employs a multitude of programs that promote awareness of Massport and tenant activities, which support improved surface and groundwater quality. Programs include implementing best management practices (BMPs) for pollution prevention by Massport, its tenants, and its construction contractors; staff and tenant training; a comprehensive SWPPP; and project-specific construction SWPPPs.

The Clean Water Act of 1972 requires permits for pollutant discharges into U.S. Waters from point sources and for stormwater discharges associated with industrial activities. Massport holds permits under the U.S. Environmental Protection Agency's (EPA's) and the Massachusetts Department of Environmental Protection's (MassDEP's) National Pollutant Discharge Elimination System (NPDES) Program. The individual NPDES permit covers Massport and its co-permittees at Logan Airport. It establishes effluent limitations and monitoring requirements for discharges from specified stormwater outfalls.

On July 31, 2007, EPA and MassDEP issued an individual NPDES Stormwater permit for Logan Airport (NPDES Permit MA0000787). The permit became effective on September 29, 2007, replacing the previous NPDES Permit dated March 1, 1978. The NPDES permit can be found on EPA's website at: https://www3.epa.gov/region1/npdes/logan/pdfs/finalma0000787rtc.pdf. The permit remains in effect until the new permit is issued by the EPA. Massport holds a separate NPDES permit for the Fire Training Facility (NPDES Permit MA0032751). The following sections describe the requirements of the two permits and Massport's compliance with these requirements.

Stormwater Outfall NPDES Permit Requirements and Compliance

The following sections describe stormwater outfalls that are subject to the NPDES Permit No. MA0000787, the monitoring requirements, and the monitoring results for 2020 and 2021.

NPDES Permitted Outfalls

The NPDES permit regulates stormwater discharges from all Logan Airport outfalls including the North, West, Northwest, Porter Street, Maverick Street, and airfield outfalls. The acreages associated with each outfall are: North Outfall Drainage Area (152 acres); West Outfall Drainage Area (449 acres); Northwest Outfall Drainage

Area (23 acres); Porter Street Outfall Drainage Area (182 acres); Maverick Street Outfall Drainage Area (34 acres); and Airfield Outfall Drainage Areas (A1 through A44), which drain the remainder of the airfield including runways, taxiways, and the perimeter roadway (910 acres). The North and West Outfall Drainage Areas also drain a portion of the airfield. These drainage areas are shown in **Figure 8-1** and further described in **Table 8-2**. The North and West Outfalls have end-of-pipe pollution control facilities to remove debris and floating oil and grease from stormwater prior to discharge into Boston Harbor.

Table 8-2 Stormwater Outfalls Subject to National Pollutant Discharge Elimination System (NPDES) Permit Requirements

Outfall Name and Number	Drainage Area (Acres)	Boston Harbor Discharge Location	Major Land Uses
North (001)	152	Wood Island Bay	Terminal E, apron, taxiway, cargo areas, fuel farms, and runways
West (002)	449	Bird Island Flats	Taxiways, terminal areas, aprons, cargo areas, runways, and roadways
Porter Street (003)	182	Bird Island Flats	Hangars, vehicle maintenance facilities, cargo areas, and car rental facilities
Maverick Street (004)	34	Jeffries Cove	Car rental facilities, bus/limousine pools, and parking areas
Northwest (005)	23	Wood Island Bay	Flight kitchens and bus maintenance facility
Airfield (A1 through A44)[1]	910	Inner Harbor	Runways, taxiways, perimeter roadways, Fire Training Facility, and Massport Fire/Rescue Station 2

Source: Massport.

1 In accordance with the requirements of the NPDES permit, Massport developed an *Airfield Stormwater Outfall Sampling Plan* (March 27, 2008). The plan requires quarterly wet weather sampling at a minimum of seven of the airfield outfalls (A1 through A44) to obtain representative samples of the quality of stormwater runoff from the airfield.

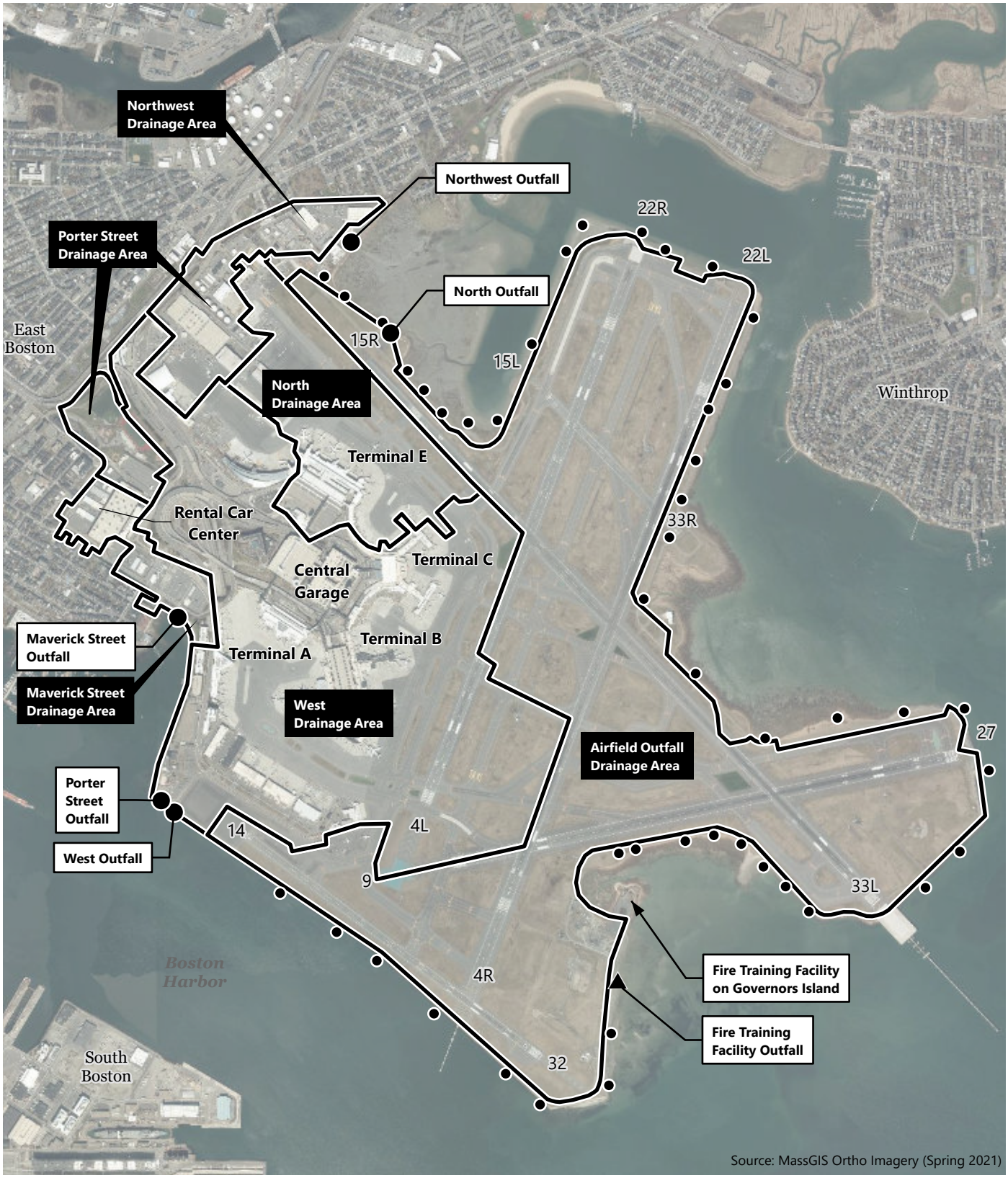


FIGURE 8-1 Logan Airport Outfalls

2020/2021 Environmental Data Report

▲ Fire Training Facility Outfall

● Airfield Stormwater Outfalls

▭ Drainage Area

0 500 1000 2000 Feet

Monitoring Requirements

NPDES permit No. MA0000787 requires grab samples (single samples collected from outfall-specific locations during low tide) to be taken monthly from the North, West, Porter Street, and Maverick Street Outfalls. Samples are tested for pH, oil and grease, total suspended solids (TSS), benzene, surfactants, fecal coliform bacteria, and *Enterococcus* bacteria during both wet and dry weather. Grab samples are also taken quarterly from these four outfalls during wet weather events to analyze for eight distinct polycyclic aromatic hydrocarbons (PAHs).

Additional NPDES permit sampling requirements include sampling for deicing compounds twice per deicing season (October through April) at the North, West, and Porter Street Outfalls. The NPDES permit sets discharge limitations for pH, oil and grease, and TSS from the North, West, and Maverick Street Outfalls and for pH from the Porter Street Outfall. The NPDES permit does not include discharge limitations for the Northwest Outfall, airfield outfalls, or the deicing monitoring, and requires only that the sampling results be reported. The NPDES permit also does not set discharge limitations for bacteria, surfactants, benzene, or PAHs for any of the outfalls; sampling results for these parameters require reporting only. Appendix J, *Environmental Compliance and Management/Water Quality,* contains additional information on the sampling requirements of the NPDES permits.

Monitoring Results

In 2020, 100 percent of stormwater samples were in compliance with standards for pH, oil and grease, and TSS. In 2021, 99 percent of stormwater samples were in compliance with standards for pH, oil and grease, and TSS. Refer to **Table J-27** in Appendix J, *Environmental Compliance and Management/Water Quality,* for more details. Due to the large size of the drainage areas and relatively low concentration of pollutants, it is not always possible to trace exceedances to specific events. Where a known event such as a spill is reported, Massport checks the drainage system for impacts from the event and undertakes all requisite corrective actions.

The NPDES water quality monitoring results are posted on Massport's website: http://www.massport.com/massport/business/capital-improvements/sustainability/water-quality/. Massport provides copies of the monitoring results to EPA and MassDEP. The 2020 and 2021 water quality monitoring results for discharge from the outfalls are provided in Appendix J, *Environmental Compliance and Management/Water Quality,* along with the history of water quality monitoring results dating back to 1993.

Deicing Monitoring

Deicing is typically conducted at Logan Airport from October or November through March or April. Deicer use is subject to the 2007 NPDES permit, which requires Massport and each airline and/or fixed base operator conducting deicing at Logan Airport to develop tailored plans for efficient deicer use. Massport and its co-permittees conducted a Deicing Management Feasibility Study to evaluate various technologies to reduce aircraft deicing fluid discharges to Boston Harbor. Massport submitted the results of the Deicing Management Feasibility Study to the EPA in May 2017.

Deicing sampling at the North, West, Porter Street, and Airfield outfalls occurred during wet weather on February 6, 2020; January 27, 2021; and March 19, 2021. Sampling results are reported as required to the EPA and MassDEP and listed in Appendix J, *Environmental Compliance and Management/Water Quality* (see **Tables J-14, J-25,** and **J-26** for deicing monitoring results).[2]

Stormwater and Sanitary Sewer System Inspections and Repairs

Between 2006 and 2008, Massport conducted inspections of the sanitary sewer and stormwater drainage system serving Logan Airport to document the condition of the systems and identify potential impacts from the sewer to the stormwater drainage system. Such impacts could result from leaks or breaks from the sanitary sewer or from direct, inadvertent, illegal cross-connections to the stormwater drainage system. As a result of these surveys, the Boston Water and Sewer Commission (BWSC) and Massport completed replacement of sections of the sanitary sewer system.

Massport's Facilities Department continues its biannual inspections of stormceptors throughout the Airport in accordance with Part I.B.10.h. of the Logan Airport NPDES Permit. The inspection and cleaning activities focus on water quality units within 100 yards of aircraft, vehicle, and equipment maintenance facilities.

In 2020, 15 percent of the units (nine) required cleaning; the remainder of the units had nominal sediment accumulations. In 2021, 7 percent of the units (four) required cleaning, with the remaining units having nominal sediment accumulations. The removed sediment was transported offsite to a solid waste landfill.

2020 and 2021 Bacteria Source Tracking

Massport continues to monitor bacteria levels at stormwater outfalls by obtaining samples during wet weather and dry weather events. Review of the laboratory analytical data indicates that bacteria levels continue to be highly variable, with no consistent trends that would indicate an ongoing source such as a cross-connection to a sanitary sewer line. Sampling results are available in Appendix J, *Environmental Compliance and Management/Water Quality*. Stormwater monitoring results can also be found on Massport's website: http://www.massport.com/massport/business/capital-improvements/sustainability/water-quality.

Fire Training Facility NPDES Permit Requirements and Compliance

NPDES Permit No. MA0032751 regulates treated wastewater surface water discharges to Boston Harbor from the Fire Training Facility on Governor's Island (**Figure 8-1**).[3] The EPA issued a new Permit effective January 27, 2021. The treated wastewater from fire training exercises is stored, treated by separation and a carbon filter to remove fuel contaminants, and is typically reused onsite to recharge the fire training pit for training exercises. If no storage is available, treated wastewater is tested prior to discharge to the storm sewer to ensure compliance with the Fire Training Facility's NPDES Permit. Discharge monitoring reports are submitted monthly to the EPA.

In 2020, Massport discharged treated wastewater to Boston Harbor on three distinct days; November 16, 20, and 27. The total gallons of treated wastewater discharged for each event were 19,809; 19,210; and 18,560 at a discharge rate of 60 to 73 gallons per minute (gpm). A composite sample was collected from each batch of

2 Wet weather deicing monitoring was only required during the first and third year of the NPDES permit.

3 NPDES Permit No. MA0032751 - Logan International Airport Fire Training Facility. Issued August 15, 2014.

treated wastewater and compliance with permit limits was confirmed before each batch of treated wastewater was discharged to Boston Harbor. Pursuant to permit requirements, the annual Whole Effluent Toxicity (WET) testing was performed during the discharge event on December 20, 2020. The WET test indicated that the full-strength effluent would not have an adverse effect on aquatic life.

In 2021, Massport discharged treated wastewater to Boston Harbor on four separate days; November 18 and 23, and December 2 and 8. The total gallons of treated wastewater discharged for each event were 19,300, 19,600, 19,500, and 19,500 at a discharge rate of approximately 83 gpm. The annual WET test performed on November 18, 2021 indicated that the full-strength effluent would not have an adverse effect on aquatic life.

Fuel Use and Spills in 2020 and 2021

Management of fueling operations at Logan Airport is designed to minimize impacts on water quality by implementing SWPPP BMPs, including the use of reliable storage, secondary containment, and effective spill cleanup procedures. Massport's jet fuel storage and distribution infrastructure, installed in 2000 and 2001, includes a zoned leak detection system for underground fuel piping, which identifies volumetric changes of product in the pipe at operating pressure and zero pressure. The system combined the storage facility with a hydrant fuel system that reduced the need for trucks and dispensing.

The fuel storage and distribution system were designed to ensure the reliable detection of leaks to the extent technologically feasible. The consolidated aboveground jet fuel storage facility and distribution system are leased and operated by BOSFuel Corporation, an airline consortium. The management of the facility by one entity was put in place to minimize potential fuel spills and maximize water quality protection for the storage and distribution facilities. Cathodic protection, leak detection, secondary containment, and tank overfill protection methods such as alarms, inventory-gauging sensors in the tanks, and emergency fuel shut-off systems have been installed. Built-in environmental controls, unified operations, and the ongoing contingency planning provide heightened environmental protection and more efficient fuel handling operations.

Massport Fire Rescue maintains records of all spills at Logan Airport (see **Table 8-3**). State environmental regulations require that fuel spills of 10 gallons or more in volume be reported to MassDEP. Spills that enter storm drains of any volume must also be reported to MassDEP. Massport maintains records of all spills, including those less than the reporting threshold. In 2020, of the oil and hazardous material spills reported to Massport Fire Rescue, four spills (6 percent) were reportable to MassDEP due to their volume and/or storm drain impact. There were two fuel spills that impacted storm drains which were subsequently remediated.

Of the four reportable spills in 2020, two of the spills occurred during aircraft fueling, the remaining two spills resulted from cargo equipment releases. By volume, jet fuel spills accounted for 51 percent of total fuel spilled; diesel fuel accounted for 10 percent; hydraulic oil accounted for 19 percent; and gasoline accounted for 7 percent. Deicing fluid, which is a non-reportable fluid under the MCP, accounted for 11 percent of spills, and the remaining percentages were from other miscellaneous fluids such as transmission fluid and motor oil.

In 2021, there were four reportable spills, two of which were due to fueling truck malfunctions; one was due to an aircraft malfunction; and the other fuel spill was due to a cargo loader malfunction. Of the fuel reportable spills, one storm drain was impacted and subsequently remediated. By total volume of fuel spilled, jet fuel accounted for

65 percent; hydraulic fluid accounted for 15 percent; diesel fuel accounted for 6 percent; and gasoline accounted for 5 percent. The remainder was a combination of AvGas, motor oil, transmission fluid, coolant, and deicing fluid.

A summary of Logan Airport jet fuel usage and spill records from 1990 to 2021, as well as details pertaining to type and quantity of the spills, can be found in Appendix J, *Environmental Compliance and Management/Water Quality* **Tables J-28** and **J-29**.

Table 8-3 Logan Airport Oil and Hazardous Material Spills and Jet Fuel Handling[1]

Year	Total Number of all Spills	Total Number of all Spills ≥10 gallons	Total Volume of all Spills (Gallons)	Estimated Volume of Jet Fuel Handled (Gallons)	Total Volume of Jet Fuel Spilled (Gallons)
2010	87	15	476	335,693,997	360
2011	108	12	572	340,421,373	337
2012	132	5	593	343,731,127	439
2013	94	6	452	349,397,940	351
2014	129	17	2,785	370,222,342	785
2015	196	16	1,278	374,985,216	885
2016	231	14	1,158	456,003,328	558
2017	176	8	2,310[2]	472,229,047	315
2018	189	8	7,660[3]	521,056,895	7,383
2019	152	22	799	542,314,657	514
2020	67	4	352	220,004,260	179
2021	152	4	787	302,650,342	514

Source: Massport Fire Rescue and Massport Environmental Management.
1 Material spills include jet fuel, hydraulic oil, diesel fuel, gasoline, and other materials such as glycol and paint.
2 1,750 gallons of deicing fluid spill in January 2017.
3 7,000 gallons of jet fuel (estimated) was released during construction on a fuel hydrant distribution line.

Tank Management Program

In 2016, Massport and its tenant tank owners complied with new state storage tank regulations as prescribed by 310 Code of Massachusetts Regulations (CMR) 80.00 administered through the MassDEP Underground Storage Tank (UST) Program.[4] These new regulations transferred jurisdiction of all USTs from the Massachusetts Department of Fire Services (DFS) to MassDEP. Jurisdiction of all aboveground storage tanks (ASTs) with capacity volumes greater than 10,000 gallons remained with the DFS, and those ASTs with less than a 10,000-gallon capacity are now under local Massport Fire Department jurisdiction. There are three ASTs at Logan Airport with volumes greater than 10,000 gallons. Two of these tanks are located in the North Service Area and contain potassium acetate runway deicing fluid. The third tank is located at the Central Heating Plant and is used for the

4 310 Code of Massachusetts Regulations 80.00.

storage of heating oil. As a BMP, Massport continues to monitor tank systems, upgrade facilities, and remove tanks as needed. Compliance with the new tank regulations included:

- Re-permitting all ASTs using a newly created Massport Fire Department tank permit;[5] and
- Updating and tracking AST permit status, using the Massport AST database.

Massport implements a tank management program that includes:

- A continuing program of monthly inspections, testing, and minor repairs of all Massport-owned tanks, related piping, tank monitoring systems, and related equipment.
- Annual Stage I Vapor Recovery testing, which was conducted in 2017 for Massport's gasoline USTs and piping systems at the Airport. Massport personnel were trained on the proper operation and inspection of the Stage I systems. Stage I vapor recovery involves the recovery of vapors from the gasoline tank by the tanker truck when deliveries occur. Stage I systems will continue to be operated, maintained, and tested on an annual basis.
- Annual DFS inspections of Massport's ASTs greater than 10,000 gallons in volume, and submittal of the inspection documentation to DFS.
- Review of all proposed tenant tank upgrades, installations, and tank removals (under Massport's Tenant Alteration Application [TAA] process)6 to ensure compliance with applicable state and federal regulations and with Massport policy.
- Ongoing upgrade and maintenance of a database that contains information on all USTs located on Massport property. For each tank, the database tracks location, permit status, third party inspection status, compliance status with applicable tank regulations, and tank and monitoring system equipment summaries. Information on ASTs is kept in a separate database developed in 2010.
- Information provided to tenants regarding the revised storage tank regulatory requirements and assistance with tenants' tank permitting procedures.

---

5 Although aboveground storage tanks (ASTs) with a capacity of less than 10,000 gallons are no longer under the jurisdiction of the Massachusetts Department of Fire Services, the tanks are still subject to the Massachusetts fire regulations. The ASTs with a capacity of less than 10,000 gallons are now under the jurisdiction of the Massport Fire Rescue. Each tank requires a permit from the Massport Fire Rescue, which does not expire unless the tank is moved to a different location. ASTs with capacity of over 10,000 gallons are required to obtain permits from Massport Fire Rescue and the Massachusetts Department of Fire Services.

6 The Tenant Alteration Application is an internal Massport process for tenants who want to make modifications to their leasehold.

Site Assessment and Remediation

Massport complies with the MCP by monitoring fuel and oil and hazardous materials spills, and tracking the status of spill response actions. The MCP (310 CMR 40 et seq.) lays out regulations that govern the reporting, assessment, and cleanup of spills of oil and hazardous materials in Massachusetts. The MCP, which is administered by MassDEP, prescribes the site cleanup process based on the nature and extent of a release's contamination. The MCP defines the roles for those parties affected by and potentially responsible for the release, and establishes the release reporting program and submission deadlines for tracking events from initial release to regulatory closure.

In accordance with the MCP, Massport assesses, remediates, and brings to regulatory compliance closure areas of subsurface contamination. There are several phases of investigation for contaminated sites. Phase I involves initial site investigations for the presence of contamination and Phase II comprehensive site investigations include site-focused risk assessments. Phase III identifies, evaluates, and selects remediation actions and Phase IV involves the implementation of selected remedial actions. Phase V involves the operation, maintenance, and/or monitoring of the remediation program. Massport undertakes the performance of a variety of response actions, including remediation at sites where Massport is the responsible party, where there are multiple responsible parties, and where no responsible party has been identified. **Table 8-4** describes Massport's progress in 2020 and 2021 in achieving regulatory closure of the MCP sites identified in **Figure 8-2**. Detailed information for sites that have achieved regulatory closure can be found in **Table J-30** in Appendix J, *Environmental Compliance and Management/Water Quality*.

FIGURE 8-2 **Massachusetts Contingency Plan Sites (Active)**

2020/2021 Environmental Data Report

1. Fuel Distribution System (3-1287)
2. Fire Training Facility (3-28199)
3. Former American Airlines - North Cargo (3-35030)
4. Terminal B Gate 5 (Formerly Gate 7) (3-35047)

0 450 900 1800 Feet

Table 8-4 Status of Massachusetts Contingency Plan (MCP) Active Sites at Logan Airport

Location (RTN) and MassDEP Reporting Status	Action/Status
1. Fuel Distribution System (FDS) RTN: 3-1287 - OPEN	
2011	A Periodic Review of the Temporary Solution for the FDS was submitted in April 2011. Three Post-Class C Response Action Outcome (RAO) Status Reports were submitted for the FDS in February, June, and December 2011, summarizing the routine inspection and monitoring activities.
2012	Post-Class C RAO Status Reports were submitted in May and November 2012, summarizing the routine inspection and monitoring activities.
2013	Post-Class C RAO Status Reports were submitted in May and November 2013, summarizing the routine inspection and monitoring activities.
2014	Post-Class C RAO Status Reports were submitted in May and November 2014, summarizing the routine inspection and monitoring activities. In addition, a Release Abatement Measure (RAM) Plan was submitted in April 2014 to address construction in the area of the FDS followed by a RAM Completion Report submitted in August 2014.
2015	Post-Temporary Solution Status Reports were submitted in May and November 2015, summarizing the routine inspection and monitoring activities.
2016	RAO-C 5-year periodic review submitted in July 2016. Two Post-Temporary Solution Status Reports were submitted in 2016 summarizing the routine inspection, monitoring, and product recovery activities.
2017	Tier II Extension transmitted in August 2017 for response actions conducted at Terminal B subsequent to filing a Temporary Solution. A Final Permanent Solution Statement was submitted for Areas 3 and 5 in December 2017.
2018	A Post-temporary Solution Status Report submitted in February, 2018; a RAM Plan submitted for Terminal C in February 2018; RAO-C Inspection Report Submitted March, 2018; a RAM Plan Modification #2 submitted for Terminal B; a RAM Status Report submitted for Terminal C; Final RAM Status Report submitted in July, 2018; Post temporary Solution Status Report submitted in July, 2018; and a RAM Plan Modification #1 for Terminal C submitted in December, 2018.
2019	A Post-temporary Solution Status Report submitted in January, 2019; Terminal B RAM Status Report submitted in January, 2019; a RAM Completion Report submitted for Terminal B Pier B in August, 2019; a Terminal C Pier B RAM Completion Report submitted in September, 2019; and a RAM Plan for the Terminal B-C Connector Project was submitted in November, 2019.
2020	RAM Plan Status Report #1 for the Terminal B-C Connector Project was submitted in March 2020; RAM Plan Status Report #2 for the Terminal B-C Connector Project was submitted in September 2020.
2021	RAM Plan Status Report #3 for the Terminal B-C Connector Project was submitted in March 2021; RAM Plan Status Report #4 for the Terminal B-C Connector Project was submitted in September 2021.

Table 8-4 Status of Massachusetts Contingency Plan (MCP) Active Sites at Logan Airport (Continued)

Location (RTN) and MassDEP Reporting Status	Action/Status
2. Fire Training Facility RTN: 3-28199 – OPEN	
2011	A RAM Completion Statement was submitted on April 25, 2011. A Phase II Scope of Work was prepared and submitted to MassDEP on January 18, 2011. Phase II and Phase III Reports were submitted on December 8, 2011. A RAM Completion Statement was submitted on April 25, 2011.
2012	Phase IV Status Report transmitted in June 2012; the Phase IV Remedy Implementation Plan was submitted in December 2012.
2013	Phase IV Status Report transmitted in June 2013; the Phase IV Completion Report was transmitted in December 2013.
2014	Phase V Remedy Operation Status Reports submitted in June and December 2014.
2015	Phase V Remedy Operation Status Reports submitted in June and December 2015.
2016	Phase V Remedy Operation Status Reports submitted in June and December 2016.
2017	Phase V Remedy Operation Status Reports submitted in June and December 2017.
2018	Phase V Remedy Operation Status Reports submitted in June and December 2018.
2019	Phase V Remedy Operation Status Reports submitted in June and December 2019.
2020	Phase V Remedy Operation Status Reports submitted in June and December 2020.
2021	Phase V Remedy Operation Status Reports submitted in June and December 2021.
3. Former American Airlines – North Cargo RTN: 3-35030 - OPEN	
2018	Release Notification made on June 29, 2018 due to presence of Non-Aqueous Petroleum Liquid in a monitoring well at a thickness not consistent with the previously submitted Response Action Outcome. Immediate Response Action (IRA) Plan submitted in August 2018; IRA Status Report submitted December 2018.
2019	Phase I and Tier Classification submitted in July 2019 A RAM Plan submitted in August 2019; a RAM Plan Status Report No. 1 was submitted in December 2019. Construction is ongoing with the Terminal E Modernization Project and subsequent reports will be filed.
2020	RAM Plan Status Report No. 2 was submitted in June 2020. RAM Plan Status Report No. 3 was submitted in December 2020.
2021	RAM Plan Status Report No. 4 was submitted in June 2021. RAM Plan Status Report No. 5 was submitted in December 2021.

Table 8-4 Status of Massachusetts Contingency Plan (MCP) Active Sites at Logan Airport (Continued)

Location (RTN) and MassDEP Reporting Status	Action/Status
4. Terminal B Gate 5 (formerly Gate 7) RTN: 3-35047 - OPEN	
2018	Release Notification in July 2018 regarding a release of jet fuel from a hydrant line during the Terminal B Optimization construction project; an IRA Plan was submitted in September 2018; and an IRA Status Report was submitted in November 2018;
2019	A final IRA Status Report was submitted in May 2019; a Phase I, Tier Classification and a Conceptual Phase II Scope of Work were submitted in July 2019, and an IRA Completion Report was submitted in November 2019.
2020	Preparation for a Phase II Comprehensive Site Assessment is underway for submission in July 2022.

Source: Massport.

Notes: RTN = Release Tracking Number. This list includes active Massport MCP sites only. Additional sites are the responsibility of Logan Airport tenants. Refer to **Figure 8-2** for location of active MCP sites. Complete information dating back to 1997 on closed sites is included in Appendix J, *Environmental Compliance and Management/Water Quality*.

Phase I Initial Site Investigation
Phase II Comprehensive Site Assessment
Phase III Identification, Evaluation, and Selection of Comprehensive Remedial Actions
Phase IV Implementation of Selected Remediation Action
Phase V Operation, Maintenance, and/or Monitoring

This Page Intentionally Left Blank.

9

Environmentally Beneficial Measures and Project Mitigation Tracking

Beginning in March 2020, flights in and out of Boston Logan International Airport (Logan Airport or the Airport) were dramatically reduced and passenger levels dropped by over 90 percent at the peak of the pandemic in the spring and summer of 2020. As a result, there were far fewer aircraft operations and passengers and a dramatic drop in overall activity at Logan Airport. While activity levels began a slow recovery in mid-summer 2020, the ongoing COVID-19 variants have resulted in continued historically low levels of activity with 2020 passengers dropping to levels of activity not seen since the 1970s. For the first 8 months of 2022 (January to August), operations were down 13 percent and passengers were down 18 percent compared to the first 8 months of 2019.[1]

As a result of the significant reduction in Airport activity and dramatic reduction in revenues, Massport, airlines, and other tenants adjusted their operations, including ground access services to reflect lower activity levels. The schedule for a number of Airport projects and programs was also adjusted. This chapter includes current projects and programs update through September 30, 2022. As a result of the pandemic and the unprecedented reduction in passengers and revenues in 2020 and 2021, many Massport and tenant projects were deferred. Massport is continuing to review the status of its projects, programs, and ground access strategies.

Introduction

This chapter of the *2020/2021 Environmental Data Report (EDR)* summarizes Massport's environmentally beneficial measures associated with Logan Airport. While many measures are applied on an individual project basis, Massport also implements a wide range of ongoing measures both to enhance operational efficiency and reduce overall environmental impacts.

EDRs and Environmental Status and Planning Reports (ESPRs) also provide updates on Massport's formal mitigation commitments under the Massachusetts Environmental Policy Act (MEPA) for projects at Logan Airport for which an Environmental Impact Report (EIR) was filed and state Section 61[2] Findings were committed in order to document that all feasible measures have been taken to avoid or minimize impacts.

1 Massachusetts Port Authority. Logan Airport Statistics. https://www.massport.com/logan-airport/about-logan/airport-statistics/.

2 Massachusetts General Law, Chapter 30, Section 61 (M.G.L. c. 30, § 61).

The first part of this chapter provides an overview of Massport's programs and initiatives that reduce operational and environmental impacts and associated environmental benefits. The second part provides updates for specific projects with ongoing or upcoming Section 61 mitigation commitments, as documented in **Table 9-1** through **Table 9-9**. Projects for which mitigation has been completed are not reported in EDRs and ESPRs. Once projects with ongoing requirements are constructed, mitigation tracking reports only on the continuing requirements. Each project discussed below completed state and federal environmental review and adopted a mitigation plan that has been formalized with individual Section 61 Findings. Massport tracks both Massport and Logan Airport tenants' progress toward implementing and meeting their environmental mitigation commitments on schedule and in accordance with the requirements set out in the Section 61 Findings for each project. As each project moves forward through its design and construction phases, its mitigation plan is implemented with ongoing tracking to ensure compliance.

Environmentally Beneficial Measures

Massport is committed to minimizing the effects of Airport operations on the community and environment by implementing a comprehensive set of Airport-wide initiatives for the benefit of the traveling public, Airport users, employees, and neighbors. These include, but are not limited to, the following environmentally beneficial measures:

- **Net Zero Roadmap by 2031:** In 2022, Massport released its *Roadmap to Net Zero by 2031*, an Authority-wide emissions reduction strategy, the goal of which is to strive to reach net zero greenhouse gas (GHG) emissions by 2031 under its direct control, by Massport's 75th anniversary. The *2022 ESPR* will report on the implementation of that program. Key pathways to Net Zero include building energy efficiency, transitioning to electric vehicles, phased procurement of a sustainable energy supply, and a range of measure to help enable emissions reduction by our tenants and business partners. Energy planning, alternative fuel program, and electric ground service equipment (eGSE) initiatives, described below, will all contribute to achieving the Net Zero Roadmap by 2031 goal.

  Additional information can be found at https://www.massport.com/massport/about-massport/roadmap-to-net-zero/.

- **High Occupancy Vehicle (HOV) Strategy.** Massport employs numerous strategies to provide ground transportation options for Logan Airport passengers and employees. The Authority's goal is to maximize the use and capacity of HOV, transit, and shared-ride options that are convenient and reliable, and that reduce environmental and community impacts. Massport continues to promote and support HOV and shared-ride services to improve operations along terminal-area roadways and at curbside areas, alleviate constraints on parking, improve customer service, and minimize emissions.

  Massport regularly evaluates and updates its strategies to improve and expand Logan Airport ground access services with a strong focus on HOV service modes. Central to this strategy is continued investment in Logan Express facilities and service. Logan Express schedules were adjusted in March 2020 in response to the COVID pandemic and the subsequent decline in ridership. Massport continued to review Airport activity levels in 2020 and 2021 to ensure its ground access programs were aligned with activity levels. In June 2021, in response to an increase in Airport activity levels, Massport increased service to both Braintree and Framingham locations and continued to evaluate new suburban Logan Express locations.

In 2021, Massport approved a new rate schedule that reduced the cost of Logan Express bus trips from $12 to $9 each way with online ticket purchases. Massport has committed to purchasing eight new Silver Line buses since the existing Silver Line fleet is reaching the end of its useful life, Massport will purchase eight Massachusetts Bay Transportation Authority (MBTA) Silver Line buses as part of a forthcoming MBTA procurement. More information can be found in Chapter 5, *Ground Access to and from Logan Airport.*

As of October 2022, all Logan Express services have been restored. The historically underperforming Peabody Logan Express operation has been relocated to a more convenient location at the North Shore Mall and the Back Bay Logan Express service was restored in October 2022.

- **RideApp Management.** Services like Lyft and Uber remain a popular option for travelers getting to and from Logan Airport. Massport has and will continue to develop strategies to facilitate efficient operation of all modes of ground transportation. In an effort to reduce congestion and emissions, Massport has implemented a robust plan to manage RideApp operations and reduce RideApp deadhead activity - those trips that don't include a rider. For more detailed information on Massport's RideApp management plan, please see Chapter 5, *Ground Access to and from Logan Airport*.
- **Long-Term Parking Management Plan.** Logan Airport's parking supply, pricing, and operations are managed to promote the use of HOV, transit, and shared-ride options and to reduce drop-off/pick-up modes, which generate up to four vehicle trips instead of two.[3] The modified Logan Airport Parking Freeze approved by the Massachusetts Department of Environmental Protection (MassDEP) and the U.S. Environmental Protection Agency (EPA) is one element of Massport's ground access strategy to reduce drop-off/pick-up modes. The modification allows for an additional 5,000 commercial parking spaces at Logan Airport. These parking spaces were planned as a future expansion of the Terminal E surface parking lot and the Economy Garage. However, due to the COVID pandemic and overall reduction in passenger activity levels, the parking expansion remains deferred.

  As noted above, beginning in March 2020 in response to the COVID pandemic, passengers and employees significantly adjusted their travel patterns to temporarily rely much more heavily on single occupancy modes which promote social distancing. Chapter 5, *Ground Access to and from Logan Airport* provides additional updates on the evolving implementation of ground access strategies.
- **Noise Abatement and Sound Insulation.** Massport's comprehensive noise abatement program includes a dedicated Noise Abatement Office; a state-of-the-art Noise and Operations Monitoring System (NOMS); extensive residential and school sound insulation programs for those eligible under federal guidelines; time of day and runway restrictions for noisier aircraft; ground run-up procedures; and flight tracks designed to optimize over-water operations (especially during nighttime hours). Massport continues to be a national leader in sound insulation mitigation. To date, Massport has provided sound insulation for a total of 36 eligible schools and 11,515 residential units, with an investment of over $170 million, and will continue to seek funding for mitigation for properties that are eligible and whose owners have chosen to participate.

3 Drop-off/pick-up modes can include private vehicles, taxis, RideApp, and black car limousine services. For example, if an air passenger is dropped off when departing on an air trip and is picked up upon return, that single air passenger generates a total of four ground access trips: two for the drop-off trip (one inbound to Logan Airport, one outbound from Logan Airport) and two for the pick-up trip (one inbound to Logan Airport, one outbound from Logan Airport). The air passenger may be dropped off and picked up in a private vehicle or in a taxi, RideApps, or a black car limousine that may not carry a passenger during all segments of travel to and from Logan Airport.

Massport continues to engage with the Federal Aviation Administration (FAA) on sound insulation mitigation. As of 2015, the FAA requires airports to use the Aviation Environmental Design Tool (AEDT) model to establish eligibility for sound insulation (homes must be within noise contour levels greater than or equal to a day-night average sound level (DNL) 65 decibels (dB)). In December 2021, FAA approved Massport's updated Residential Sound Insulation Program (RSIP) Noise Exposure Map (NEM). In 2022, Massport applied for and was approved for an initial grant by the FAA to fund the beginning phase of the RSIP program. Massport will continue to submit updated NEM when appropriate to ensure that the RSIP is based on the latest Logan noise environment.

After advocacy from elected officials and Massport, for the first time the FAA will allow a residence to be treated under the sound insulation program one time; homes treated previously after 1993 are not eligible for additional consideration.[4] See Appendix H, *Noise Abatement,* for more information.

These efforts and progress towards achieving noise reduction goals, can be found in Chapter 6, *Noise Abatement*.

- In June 2022, Massport and FAA concluded work with the Massachusetts Institute of Technology (MIT) to identify opportunities to reduce noise through changes to performance-based navigation (PBN), including area navigation (RNAV). This was a first-in-the-nation project between the FAA and an airport operator to better understand the implications of PBN and evaluate strategies to address community concerns. Massport continues to coordinate with the Massport Community Advisory Committee (CAC), the FAA, and MIT on targeted, additional technical questions and reviews.
- Massport is working with the Aviation Sustainability Center (ASCENT) on research projects concerning aircraft noise, flight procedures and air quality monitoring related to ultrafine particles (UFPs).

- **Air Emissions Reduction**. Massport is a national leader in studying, tracking, and reporting on the air quality environment of Logan Airport, and implementing measures to reduce emissions. Initiatives include operating one of the largest privately operated, publicly accessible, compressed natural gas (CNG) stations in New England; providing pre-conditioned air (PCA) and 400 Hertz (Hz) power at all aircraft contact gates to reduce aircraft idling; and a commitment to sustainable design. More information can be found in Chapter 7, *Air Quality/Emissions Reduction*. Additionally, Massport actively enforces federal and state anti-idling regulations.

Source: Massport.
Notes: Examples of Logan Airport anti-idling signs.

4 FAA Airport Improvement Handbook, Table C-5 Item (8), page C-19.

- **Alternative Fuel Vehicles (AFV) Program.** The AFV Program is designed to replace Massport's conventionally fueled fleet with alternatively fueled or powered vehicles, when feasible, to help reduce emissions associated with Logan Airport operations. Massport now operates 103 vehicles powered by CNG, propane, E85 flex fuel, diesel/electric hybrid, gasoline/electric hybrid, and plug-in electric. Massport also established a vehicle procurement policy in 2006 that requires consideration of AFVs when purchases are made. For example, beginning in 2013, as part of the Southwest Service Area (SWSA) redevelopment, the existing fleet of diesel rental car shuttle buses was replaced by CNG or clean diesel-electric hybrid buses. In 2017, two CNG Honda Civics were retired, and the remaining seven were retired in 2019 and replaced with seven plug-in electric hybrid vehicles. The remaining CNG pick-up trucks and vans were retired in 2018. More information can be found in Chapter 7, *Air Quality/Emissions Reduction*.
- **Electric Ground Service Equipment (eGSE).** Massport is facilitating the replacement of gas- and diesel-powered ground service equipment (GSE) with eGSE, as commercially available. Massport has been awarded grants to facilitate this initiative, including:
  - In 2020, Massport was awarded a grant through FAA's Voluntary Airport Low Emission Program (VALE) for charging infrastructure at Terminal E and Signature Aviation Building 14 to install 10 eGSE charging stations.

  More information can be found in Chapter 7, *Air Quality/Emissions Reduction*.
- **Open Space/Buffer Program.** Massport has invested in an extensive open space program intended to enhance the surrounding communities. Massport initially committed over $15 million for the planning, construction, and maintenance of four Airport edge buffer areas and two parks along Logan Airport's perimeter. These buffers include the Bayswater Embankment Airport Edge Buffer, Navy Fuel Pier Airport Edge Buffer, Neptune Road Airport Edge Buffer, and the SWSA Airport Edge Buffer (Phases I and II). The award-winning Piers Park was completed in 1995 and has since become part of a network of greenspace that traverses East Boston from the Jeffries Point waterfront to Constitution Beach. In 2014, Massport completed construction of the East Boston Greenway Extension that connects Bremen Street Park to Wood Island Marsh. In 2016, Massport assumed operations of the City's Greenway extension to Constitution Beach. In October 2019, the East Boston Greenway was renamed Mary Ellen Welch Greenway, after a long-time East Boston community activist.

  Adjacent to the current Piers Park, Piers Park Phase II will add approximately 4.2 acres of green space to the East Boston waterfront upon completion. Construction commenced in October 2022 and the new facility is scheduled to open in late 2023.

Source: Massport.
Notes: Piers Park II Rendering.

  Studies are underway by the Trustees of Reservations for a proposed Piers Park Phase III, which would transform the deteriorating pier into a 3.6-acre public greenspace including resiliency features to help protect the East Boston

neighborhood from flooding and sea level rise. Massport issued a Request for Proposals in February 2018 for design and construction of Piers Park Phase III. In 2020, The Trustees of Reservations were selected to advance planning and permitting for this facility. Initial site feasibility studies are underway, as is stakeholder outreach.

Today, East Boston enjoys 3.3 miles and more than 33 acres of green space developed or managed by Massport, in partnership with and in response to engagement with the East Boston community. More information can be found in Chapter 3, *Airport Planning*.

- **Energy Planning.** Massport is studying opportunities to maximize solar installations across Logan Airport and installing electric vehicle infrastructure on the airside and in parking garages. Massport has installed electric charging facilities in all its garages and will also install them in the proposed new garage in front of Terminal E and the expanded Economy Garage (project currently deferred). More information can be found in Chapter 3, *Airport Planning*.
- **Resiliency Planning.** Massport has a robust effort underway that first identified vulnerabilities on the Airport and has incorporated resilient infrastructure design standards for all types of Airport projects. At the end of 2013, Massport initiated a Disaster and Infrastructure Resiliency Planning (DIRP) Study for Logan Airport, the Port of Boston, and Massport's waterfront assets in South and East Boston. The study was completed, and implementation of adaptation initiatives began in late 2014.

  In addition to the DIRP Study and its related initiatives, Massport has completed an Authority-wide risk assessment, as part of its strategic planning initiative; issued a *Floodproofing Design Guide*; and has developed a resilience framework to provide consistent metrics for short- and long-term planning and protection of its critical facilities and infrastructure. Massport's *Floodproofing Design Guide* was published in November 2014 and updated in November 2018. Beyond infrastructure resiliency, Massport is also focused on incorporating social and economic resilience into its long-term operational and capital planning.

  Operational aspects of the resiliency strategy include the development of Flood Operations Plans for Logan Airport and Massport maritime facilities. These plans were introduced in 2014 and included the planned deployment of temporary flood barriers to protect up to 12 locations of critical infrastructure in the event of severe weather. The test deployments and live event staging for the March 2018 Nor-easters succeeded in managing and tracking flood barrier deployment logistics and effective communication. As a result, Logan Airport's Flood Operations Plans and operational responses have evolved. A web-based coastal flood resiliency application was developed to better manage planning immediately prior to an event impact, and to facilitate operational response and recovery as quickly as possible. Additional locations have been permanently enhanced to prevent flooding.

  In 2017, Massport conducted a series of workshops with key stakeholders to review and continuously improve its Flood Operations Plans. In addition, many education and training opportunities have been provided to staff and emergency responders to increase operational preparedness for flood events. In March 2018, Massport conducted several practice deployments of flood barriers at three critical Logan Airport assets. Between 2020 and 2021, Massport conducted a tabletop exercise for Aviation and Maritime in preparation for extreme storm events such as hurricanes. Additionally, Massport developed a flood resiliency application to inform decision-making, facilitate management oversight, and enable real-time field updates via mobile devices before, during, and after storm events. More information can be found in Chapter 3, *Airport Planning*.

- **Sustainability Planning.** Massport has a robust sustainability program including the following sustainable initiatives:
  - The *Logan Airport Sustainability Management Plan (SMP)* takes a comprehensive approach to sustainability including economic vitality, social responsibility, operational efficiency, and natural resource conservation. The *Logan Airport SMP* is intended to promote, integrate, and coordinate sustainability efforts across the Authority. The *Logan Airport SMP* was developed with a framework and implementation plan, with metrics and targets designed to track progress over time. Massport is currently advancing a series of initiatives to help reach its goals in the areas of energy and GHG emissions; community, employee, and passenger well-being; resiliency; materials, waste management, and recycling; and water conservation. Each year since the publication of *the Logan Airport SMP*, Massport has continued to widen the lens of its sustainability and resiliency goals to incorporate its other aviation and maratime facilities. During 2020 and 2021, Massport also sought new avenues to be a better neighbor to surrounding communities—reducing noise and air pollution, improving ground access to Logan and extending Diversity, Equity & Inclusion (DE&I) initiatives beyond its operational borders.
  - The *Massport Annual Sustainability and Resiliency Report* provides a progress summary of sustainability efforts at Logan Airport, and other Massport facilities, based on Massport's sustainability goals and targets established in the *Logan Airport SMP*. The next report is anticipated to be released in 2022.
  - Each year since 2015, Massport distributes *Sustainable Massport* calendars to employees and other stakeholders. The calendars are filled with examples of Massport's sustainability projects and successes, and each month highlights aspects of environmental, social, and economic aspects of sustainability to which employees can contribute. Due to budget constraint, the calendars were not produced for calendar year 2022.

Projects with Ongoing Mitigation

The following section documents the status of projects with specific Section 61 mitigation commitments, in chronological order. Massport will continue to report on the status of mitigation in EDRs and ESPRs to provide a solid accounting of Massport's commitment to regulatory compliance and to provide information to the community. The status of continuing mitigation requirements is documented in this chapter.

- **West Garage Project,** Executive Office of Energy and Environmental Affairs (EEA) #9790: Phase I and Phase II construction was completed in 2007.
- **International Gateway Project**, EEA #9791: Phase I was completed in 2004; Phase II was completed in 2007; and the final phase has been changed to the Terminal E Modernization Project (EEA #15434) (see below).
- **Replacement Terminal A Project**, EEA #12096: Terminal A opened March 16, 2005.
- **Logan Airside Improvements Planning Project**, EEA #10458: Runway 14-32 opened on November 23, 2006. The Centerfield Taxiway was completed and became fully operational in 2009.
- **Southwest Service Area (SWSA) Redevelopment Program**, EEA #14137: Construction of the Rental Car Center (RCC) program began in the summer of 2010, and the first phase of the facility opened in the fall of 2013. Other phases of the project were completed in 2014.

- **Logan Airport Runway Safety Areas (RSA) Project**, EEA #14442: Construction on the Runway 33L RSA began in June 2011 and was completed in November 2012. The replacement of the Runway 33L approach light pier was completed concurrently with Runway 33L RSA construction. Construction of the Runway 22R Inclined Safety Area (ISA) was completed in the fall of 2014.
- **Terminal E Modernization Project**, EEA #15434: The project will accommodate existing and long range forecasted passenger demand for international service and will include the three gates permitted and approved as part of the International Gateway West Concourse Project in 1996 (but never constructed), and four additional new aircraft contact gates. An Environmental Notification Form (ENF) was filed in October 2015, the combined state and federal Draft Environmental Assessment (EA)/EIR was filed in July 2016, and the Secretary of the EEA issued a Certificate on the Draft EA/EIR on September 16, 2016. Massport filed the Final EA/EIR on September 30, 2016. On November 10, 2016, the FAA issued a Finding of No Significant Impact (FONSI) and on November 14, 2016, a Record of Decision (ROD) for the project, indicating that Massport can now update the Airport Layout Plan (ALP) with the proposed Terminal E Modernization Project. Initial construction began in 2019 (see Chapter 3, *Airport Planning,* for additional information).
- **Logan Airport Parking Project,** EEA #15665: The project involves the phased addition of commercial parking at Logan Airport consistent with the amendment to the Logan Parking Freeze. An ENF was filed in 2017 concurrent with the MassDEP review of the Logan Parking Freeze Amendment. The ENF was filed to assist reviewers in understanding where and how Massport would add parking at Logan Airport if the amendment was approved. A combined state and federal Draft EIR/EA was filed in May 2019 and was followed by the Final EIR/EA in December 2019. A federal FONSI was issued by FAA in December 2019. Following completion of the state and federal environmental review process, Massport began final design of the first 2,000 spaces to be constructed in a multi-level garage within the footprint of the existing surface parking lot in front of Terminal E. Final design and construction of this project has been deferred due to the reduction in passenger activity associated with the COVID pandemic.

West Garage Project – EEA #9790

Permitting History

- Certificate on the Final EIR (FEIR) issued on March 16, 1995.
- Section 61 Findings approved on March 27, 1995.

Project Status

The West Garage is directly connected to the Central Garage, centralizing the two structures' parking into a larger, single functioning, easily accessible garage. The West Garage Project (**Figure 9-1**) was constructed in two phases. Phase I of the Project provided 3,150 parking spaces that were consolidated from other areas of Logan Airport. The West Garage Project also included construction of elevated walkways connecting the West Garage to Terminals A and E, and improvements to the terminal roadways. The original design of Phase II of the West Garage included the construction of a new structured parking facility adjacent to the West Garage. Instead, Massport concluded it was more cost efficient to proceed with Phase II by adding three additional levels (Levels 5, 6, and 7) to the existing Central Garage. Phase II of the West Garage Project provided approximately 2,800 additional parking spaces.

- **Phase I** – Construction commenced in October 1995 and the garage opened on September 8, 1998. The elevated walkways to the terminals were completed in 2002. Improvements to terminal roadways were completed in 2003.
- **Phase II** – Permitting was completed in 2000 to add three levels to the Central Garage. Construction commenced in 2004 and the entire facility enhancement was completed in 2007.

Table 9-1 lists each of the continuing Section 61 mitigation commitments for the West Garage Project and Massport's progress in achieving these measures. **Table 9-2** details the elements and status of the AFV Program, which was a key mitigation effort associated with the West Garage Project. **Tables 9-1** and **9-2** detail the Section 61 mitigation measures from the West Garage Project FEIR, dated January 31, 1995, and those measures referenced in the Massport Board vote on the West Garage Project. Many of the mitigation measures for this project have long since been implemented, but it is noted in the tables when there have been recent updates.

Unrelated to this project, in late 2015, Massport completed the West Garage Parking Consolidation Project, which consolidated 2,050 temporary parking spaces as part of an addition to the West Garage and at the existing surface lot between the Logan Office Center and the Harborside Hyatt. The West Garage addition is located on the site of the existing Hilton Hotel parking lot. Construction of these spaces constituted all of the remaining spaces permitted under the Logan Airport Parking Freeze as of that date.[5] On March 20, 2014, EEA issued an Advisory Opinion confirming no MEPA review was required for this project. Construction commenced in the spring of 2015 and was completed in 2016.

5 310 Code of Massachusetts Regulations 7.30 and 40 Code of Federal Regulations 52.1120.

FIGURE 9-1 West Garage Project | **2020/2021 Environmental Data Report**

◆ West Garage Project EEA #9790

Phase I West Garage Construction
Phase II Addition to Central Garage

0 500 1000 2000 Feet

Table 9-1 West Garage Project Status Report (EEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022)

Mitigation Measure	Status
Parking Pricing	
Parking pricing initiatives: keeping first-hour price high enough to provide a disincentive for drop-off/pick-up.	**Implemented.** Massport continues to evaluate and adjust the first-hour price of parking. In light of the security prohibition on curbside parking, in 2002 Massport reduced the cost of the first half-hour from $4 to $2, the first time it had changed since the first-hour free rate was rescinded in 1998. In June 2007, rates increased to $3 for the first half-hour. Parking rates increased in 2012, 2014, 2016, 2017, and 2019 for on-Airport parking; further details on parking rate increases are provided in **Table 5-5** of Chapter 5, *Ground Access to and from Logan Airport*.
Parking pricing initiatives: keeping the weekly price low enough to encourage vacation travelers to park for a week.	**Implemented.** Massport encourages long-term parking by providing lower cost parking at its Economy Lot and the off-Airport Logan Express lots. The long-term Parking Management Plan lays out a multi-part strategy for efficiently managing parking supply, pricing, and operations. Data on long-term parking use are provided in Chapter 5, *Ground Access to and from Logan Airport*.
Massport will consider means to encourage the use of limited amount of on-Airport commercial parking for long-term parking and promote environmentally positive modes of airport access by air passengers.	**Implemented.** An important element of Massport's strategy to reduce the impact of Airport-related traffic on regional highways and local streets in neighboring communities is the Massport Parking Pricing Policy. Massport's Parking Pricing Policy encourages long-term parking over short-term parking by charging a premium for time spent in the on-Airport parking facilities between one and four hours and substantially reducing the per hour rate for parking durations longer than four hours. This strategy has proved to be a successful incentive for passengers to drive themselves and park long-term at Logan Airport rather than having someone else drop them off or pick them up, thereby reducing the number of trips from four to two. Additional information on parking is provided in Chapter 5, *Ground Access to and from Logan Airport*. The Logan Airport Parking Project, which was approved in 2020, will ultimately provide 5,000 new on-Airport parking spaces in accordance with the amended Logan Airport Parking Freeze. A key goal of the Project is to provide parking for those passengers that would otherwise use drop-off/pick-up modes and generate a higher number of associated trips. The initial 2,000 spaces are planned for the surface lot in front of Terminal E; final design is underway. The timing of construction of Phase I is deferred due to the reduction in passenger activity associated with the pandemic. Future Environmental Data Reports (EDRs) will provide updates on the timing of Phase I and the remaining 3,000 spaces, as available.
Once sufficient data have been collected, Massport will evaluate parking behavior that may be attributable to the modified rates and consider further adjustments in pricing that will assist in achieving Massport's ground transportation goals.	**Implemented.** Massport's parking rate structure is compatible with continued growth in long-term parking and Massport's goal to increase the total high occupancy vehicle (HOV) use by air passengers. Adjustments to hourly parking rates are made over time to reflect usage patterns. Additional information on parking pricing is provided in Chapter 5, *Ground Access to and from Logan Airport*.
Executive Director shall report to Massport annually regarding the effectiveness of parking pricing policy in achieving Massport's ground access goals initiatives and recommend appropriate policy adjustments.	**Implemented**. Through the annual Environmental Data Report (EDR/ Environmental Status and Planning Report (ESPR) filings, Massport reports on the effectiveness of parking pricing strategies. Please refer to Chapter 5, *Ground Access to and from Logan Airport*, for additional details on Massport's parking pricing efforts.

Table 9-1 West Garage Project Status Report (EEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Concurrent Ground Access Improvement Mitigation Measures	
Employee Trip Reduction Measures	
Massport will form a Transportation Management Association (Logan TMA) for Logan Airport employees to provide new opportunities for the development of targeted transportation demand management (TDM) strategies for Massport and airport tenant employees.	**Implemented.** In the 1995 Board Resolution, Massport's Executive Director was authorized to expend an initial amount of up to $50,000 for the purpose of organizing the Logan TMA. The Logan TMA was created in March 1997. Massport continues to support the Logan TDM strategies by funding the Logan Sunrise Shuttle at an annual cost of $65,000. Massport continues to conduct outreach through new hire orientation materials and other communications to raise awareness of employee commute options with a focus on HOV modes.
Massport will seek to develop, coordinate, and implement effective TDM strategies to reduce the number of single-occupant trips made by all Logan Airport employees, including outreach to employees about transportation options.	**Implemented.** Massport supports TDM strategies by providing services and by periodically conducting the Massport Employee Survey. The *2019 Logan International Airport Air Passenger Ground-Access Survey (2019 Air Passenger Ground-Access Survey)* is summarized in Chapter 5, *Ground Access to and from Logan Airport*. Massport surveys its employees as part of its Massachusetts Department of Environmental Protection (MassDEP) Rideshare reporting requirements.
Massport will encourage participation by all employees, but will particularly target the Airport's largest employers.	**Implemented.** Refer to Chapter 5, *Ground Access to and from Logan Airport,* for more details on the Logan TMA.
Massport will report on the formation and activities of the Logan TMA in the next Generic Environmental Impact Report (GEIR).	**Implemented.** The current status of the Logan TMA is summarized in Chapter 5, *Ground Access to and from Logan Airport*.
Massport proposes to implement a new Logan Express service or other HOV service depending on the needs of the targeted market before Phase II of the West Garage Project is operational.	**Implemented**. The Peabody Logan Express facility opened in September 2001 (see Chapter 5, *Ground Access to and from Logan Airport,* for additional information on Peabody Logan Express), well in advance of this regulatory requirement. In 2014, Massport initiated the Back Bay Logan Express pilot service, which provides travelers scheduled trips between the Hynes Convention Center, Copley Square Station, and Logan Airport. This route was initially established as an interim/pilot service to supplement ground access to Logan Airport while the Massachusetts Bay Transportation Authority (MBTA) Green Line at Government Center station was temporarily closed for reconstruction. The new Government Center station reopened in March 2016. Due to growth in demand and growing urban congestion, the service has continued. The Back Bay Logan Express service was relocated from Copley Square to Back Bay Station in 2019. Coincident with the relocation was a reduction in fees from downtown to Logan Airport, free boarding at Logan Airport, and preferred access to security lines for passengers. Back Bay Logan Express service restored in October 2022. In February 2022, the Peabody Logan Express site was relocated and reopened. In 2019, Massport also initiated permitting for additional parking at the Framingham Logan Express site. Approvals for the Framingham expansion were granted in 2020; construction is currently deferred pending funding.

Table 9-1 West Garage Project Status Report (EEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Employee Trip Reduction Measures	
Provide an airport shuttle service from South Station Transportation Center. Massport is preparing a feasibility and business plan for a South Station-Logan Airport shuttle service and will implement this service when the Third Harbor Tunnel is opened for commercial traffic. This service will be modeled on the existing, successful Logan Express services and will include frequent bus service between South Station and the airport terminals. *Massport will regularly evaluate the frequency of, and demand for, such shuttle service and will provide such service at the greatest frequency that is practical and effective.*	**Implemented.** In 1997, Massport sponsored the development of a joint public/private partnership with intercity bus operators serving the South Station Transportation Center. The service had limited success largely because of variable operator schedules and the fact that the service operates out of the South Station Transportation Center instead of a location closer to the MBTA Red Line South Station stop. Following the interim Logan DART service between Logan Airport and South Station in 2000, in June 2005, Massport and the MBTA jointly commenced full Silver Line Airport Service, providing a direct connection between South Station and each Logan Airport terminal. Refer to Chapter 5, *Ground Access to and from Logan Airport,* for additional information on the Silver Line. **Implemented.** Massport continues regular collaboration with the MBTA on the Silver Line Airport service and makes adjustments as necessary. Beginning in May 2012, Massport initiated a pilot program offering free rides on the Silver Line from Logan Airport to downtown Boston to promote HOV usage and heighten awareness of public transit options. The purpose of the program was to promote ridership, operations, and customer service. Free service from Logan Airport continues as of the date of this *2020/2021 EDR*. Additionally, Massport plans to purchase eight MBTA Silver Line buses as part of a forthcoming MBTA procurement.
Massport will implement a new water shuttle service in Boston Harbor before the opening of Phase I of the West Garage Project. The water shuttle would run between Logan Airport and one, or possibly more, sites in the Harbor.	**Implemented.** Massport identified a number of possible destinations for a new water shuttle service, with the Quincy Shipyard and Long Wharf sites meeting the basic service parameters. Harbor Express was chosen as the water shuttle operator and began operation between the Airport and these two sites in November 1996. Massport continues to support the City Water Taxi operations. Refer to Chapter 5, *Ground Access to and from Logan Airport,* for water shuttle ridership information.
The Executive Director shall make recommendations to Massport for budgetary appropriations to establish and implement the new ground access services on a schedule that permits Massport to implement the new ground access services within these time frames.	**Implemented.** Massport's Executive Director/CEO recommends budgetary appropriations for ground access services on an annual basis.
Enhancement of Existing HOV Services: Logan Express	
Expand Logan Express hours of service.	**Implemented.** During 2019, service was offered from Braintree as early as 2:00 AM and as late as 11:00 PM; from Framingham as early as 2:15 AM and as late as 11:00 PM; from Woburn as early as 2:15 AM and as late as 11:00 PM; and from Peabody as early as 3:15 AM and as late as 10:15 PM. Buses leave every hour or half hour. Logan Express buses departed from Logan Airport as late at 1:15 AM. The Braintree service was expanded in 2019 to operate on 20-minute frequencies. The Back Bay Logan Express operated daily trips between the hours of 5:00 AM and 10:00 PM. Logan Express schedules were adjusted in March 2020 in response to the COVID pandemic but have been restored.

Table 9-1 West Garage Project Status Report (EEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as September 30, 2022) (Continued)

Mitigation Measure	Status
Enhancement of Existing HOV Services: Logan Express	
Expand Logan Express hours of service.	Schedules are available at http://www.massport.com/logan-airport/to-from-logan/transportation-options/logan-express/.
Provide a guaranteed ride home for Logan Express users.	**Implemented and subsequently modified.** From January 1995 until November 2001, Massport provided this service for air passengers and Logan TMA members. Due to financial constraints following September 11, 2001, this program was suspended for those passengers arriving after midnight with pre-purchased round-trip Logan Express tickets. Extended service now provides nearly 24-hour service at several Logan Express locations.
Provide Logan Express price incentives.	**Implemented.** Massport continues to monitor price incentives and implements additional incentives to promote Logan Express ridership, particularly during vacation periods and other periods of peak airport activity. In April 2011, Logan Express sites offered a discounted rate for parking. A survey of Logan Express passengers revealed that drop-off activity at Logan Airport was reduced and the demand for parking at Logan Airport was reduced during the period of the discounted Logan Express parking. To encourage greater ridership, Massport restructured parking rates, which lowered parking rates at Logan Express parking lots. These rates have been in effect since March 1, 2012 (and resulted in increased Logan Express passenger activity at rates greater than the rate of increase in Logan Airport air passengers). Online ticket purchases have a reduced price of $12 to $9 as of 2021. Additional seasonal and holiday promotions are also offered.
Develop an additional Logan Express service.	**Implemented.** Massport opened a fourth Logan Express in Peabody, Massachusetts in September 2001, several years before the Section 61 commitment date of the opening of Phase II of the West Garage Project. While the new service was initially planned to operate on a half-hour schedule like the Braintree, Framingham, and Woburn services, because of the dramatic air passenger reductions after September 11, 2001, (during Peabody's first week of service), to cut costs, Massport operated the Peabody Logan Express on hourly frequencies. In January 2004, in light of low levels of ridership on the Peabody Logan Express, Massport doubled service by going to a half-hourly schedule in an effort to stimulate ridership growth at Peabody. In 2018 and 2019, the service operated on an hourly weekday schedule. In 2014, Massport initiated an interim Back Bay Logan Express pilot service, which provides travelers with three scheduled trips per hour between the Hynes Convention Center, Copley Square Station, and Logan Airport. The Back Bay Logan Express service was relocated from Copley Square to Back Bay station in May 2019, along with discounted one-way fares and free service from Logan Airport. Security line priority status to Logan Express Back Bay riders is also provided. Massport's plan to operate a new urban Logan Express location between North Station and Logan Airport is currently on-hold (although Massport procured buses for this service in 2020).
Enhancement of Existing HOV Services: Water Transportation	
In conjunction with the MBTA, Massport will pursue joint ticketing opportunities for the Hingham Commuter Boat and the Logan Airport Water Shuttle.	**Implemented.** This ticketing program was implemented in mid-1995 and discontinued in 2000 since many of the former users of the program used the Harbor Express Service direct from Quincy to Logan Airport at that time. Service is now provided from Hingham and Hull directly to Logan Airport (via Long Wharf).

Table 9-1 West Garage Project Status Report (EEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Enhancement of Existing HOV Services: Water Transportation	
Massport is reviewing the fee schedules and operating requirements of the dock to make it more accessible and convenient to potential water taxi operators.	**Implemented.** In the fall of 1995, Massport made physical improvements to a low-freeboard float at the Logan Airport Dock to create a dock capable of accommodating smaller vessels such as water taxis. In the fall of 2002, Massport completed expansion of the Harborside Dock to accommodate the demand of additional vessels and to comply with handicapped accessibility requirements. The improved dock increases capacity from a two-float system to a seven-float system to accommodate the various water shuttles, taxis, and charter boats that are licensed to use it. Massport continues to provide free on-Airport shuttle service to the water shuttle dock.
Initiate a new Boston Harbor Water shuttle service.	**Implemented.** Harbor Express service, between Logan Airport and the South Shore, began in November 1996, well before the opening of Phase I of the West Garage in September 1998. In 2001, the MBTA took over operations of this service.
Expand docking capacity at Logan Airport for water taxi and other services.	**Implemented.** Massport accommodates water taxi services, enhanced the dock as described above, provides communication links for passengers to call the taxi, and allows taxi passengers to use the free shuttle buses to access the terminals from the dock. Water taxi information is posted on the Massport website. Details on water taxi services are provided in Chapter 5, *Ground Access to and from Logan Airport.*
Other Measures	
Coordinate with public and private entities to provide more extensive radio, television, and telephone announcements of poor traffic conditions with suggestions for alternative access modes.	**Implemented.** Callers to the Customer Information Line (1-800-23LOGAN) may access the latest traffic information, flight status, parking information, cell phone waiting lot information, or learn about alternative forms of transportation to and from Logan Airport. Starting in August 1999, real-time traffic information and parking became accessible on Massport's website. Massport regularly contacts the media to inform the public about roadway changes, parking shortages, and to encourage travelers to use HOV services. Similar information is disseminated on the Logan Airport e-mail subscriber list, the Massport website, Facebook, and on Twitter at twitter.com/bostonlogan.
HOV Marketing and advertising. Massport will continue the advertising and marketing programs for HOV services with an emphasis on promoting MBTA, Logan Express and water shuttle services to and from the Airport.	**Implemented.** Massport continues to market Logan Express services via Massport's website and other media. Massport continues to promote HOV services including availability, schedules, and fares to consumers through the Customer Information Line at 1-800-23LOGAN and the website, which provide up-to-the-minute information. Massport has actively promoted passenger water transportation in Boston Harbor for more than 20 years, playing a leadership role in policy development, planning, and promotions. This has included promoting vessel services at Logan Airport in the following ways:

Table 9-1 West Garage Project Status Report (EEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Other Measures	
HOV Marketing and advertising. Massport will continue the advertising and marketing programs for HOV services with an emphasis on promoting MBTA, Logan Express and water shuttle services to and from the Airport.	▪ Annual updates and in-terminal distribution of a brochure promoting water transportation at Logan Airport; ▪ Annual updates of a harbor-wide water transportation map showing routes serving Logan Airport along with other routes and landings – Massport provides this map to the MBTA, area non-profits, and others interested in promoting passenger water transportation in Boston Harbor. ▪ Updated information promoting passenger water transportation at Logan Airport on 1-800-23LOGAN and www.massport.com; and ▪ Collecting, tracking, and disseminating passenger water transportation ridership data for Logan Airport passengers to aid in planning and facility development.
Prepare an inventory of private scheduled services including origins/destinations, schedule, and cost.	**Implemented.** Massport continues to update and track information and services by hundreds of privately operated passenger services certified to operate at Logan Airport. Industry changes with such operations make publication of reliable service and schedule information impractical, if not impossible. However, Massport continued to expand and update information on transportation options to Logan Airport using: ▪ Information and links to transportation companies on the Massport website. Some sites accessed through internet links provided passengers with online reservation services. ▪ Most scheduled service operators provided placards with current schedules posted in bus stop shelters located on the curb at each terminal. Individual bus schedules were also available at the information booths. ▪ Transportation information database for online assistance at Logan Airport terminal information booths.
Proceed with environmental review and seek funding for construction of People Mover system.	**Implemented.** In 1998, Massport completed the Environmental Assessment (EA) and Major Investment Study for the *Logan Airport Intermodal Transit Connector* (AITC). The AITC evolved out of the People Mover process and evaluated new access routes to both the MBTA Blue Line and the South Station Transportation Center. On February 25, 1997, Massport submitted to the U.S. House Committee on Transportation and Infrastructure an application for Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) funds for the next phase of environmental review, planning, and design of the AITC. Congressman J. Joseph Moakley was the congressional sponsor; the project also had the support from the Secretary of Transportation and the U.S. Environmental Protection Agency (EPA). The Logan AITC was included, for an unspecified funding level, in the 1997 ISTEA reauthorization bill.

Table 9-1 West Garage Project Status Report (EEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Other Measures	
Proceed with environmental review and seek funding for construction of People Mover system.	In 1998, Massport received a Certificate on a Notice of Project Change (NPC) for the People Mover from the Secretary of the Executive Office of Energy and Environmental Affairs (EEA) and a Finding of No Significant Impact (FONSI) on an Environmental Assessment (EA) from the Federal Transit Authority. In June 2001, Massport and the MBTA executed an interagency agreement for the purchase of eight Silver Line dual mode buses and the Massport Board approved the expenditure of approximately $13 million for this purchase. In 2004, Massport and the MBTA finalized the 10-year/20 million-dollar Interagency Operating & Maintenance Agreement. Initial Silver Line service to the Airport began in December 2004 and full service began in June 2005. Services continue to be adjusted to meet growing demand as described in *Chapter 5, Ground Access to and from Logan Airport*. Several options were identified to reduce on-Airport congestion and improve on-Airport ground access efficiency. Initial options included dedicated HOV bus lanes, the creation of an intermodal transportation center with bus service to terminals, the construction of an Automated People Mover (APM), or some combination of these improvements (see Chapter 3, *Airport Planning,* for more information). These and other options are currently on hold and will be revisited once passenger levels recover closer to 2019 levels.
Alternative Fuels Program. Massport is carrying out an extensive program to convert existing Massport-owned service vehicles to environmentally preferable sources.	**Implemented. Table 9-2** details Massport's progress in achieving these measures. The current focus is on a transition to non-emitting electric vehicle where suitable replacements are available.
Massport will assess progress towards the achievement of HOV goals using on-Airport Automated Traffic Monitoring Systems (ATMS).	**Implemented.** Massport has an ATMS plan that provides daily traffic counts at all gateways and other critical locations. Massport uses technologies that utilize on-Airport traffic signal controllers and loops for traffic counting. The Logan Airport ATMS uses technologies that detect vehicle movement (inductive loop lines and microwave sensors). The project is complete and the upgraded ATMS is functioning as planned and designed.
Massport will assess progress towards the achievement of HOV goals by monitoring parked vehicles using systems such as the parking and revenue control (PARC) system.	**Implemented.** Massport monitors all parking activity at Logan Airport and inventories all commercial parking facilities on a daily basis. PARC systems are at all on-Airport parking locations.
Measuring, Monitoring, and Evaluating Ground Access Improvements	
Monitor HOV Services (Logan Express, MBTA, water shuttle, limousine/bus, and taxi).	**Implemented.** Massport maintains a "real time" log of dispatcher reports for Logan Express, the taxi pool, and the bus/limousine pool and other ground transportation operations at Logan Airport. Massport coordinates with the MBTA and the operators of all water shuttles serving Logan Airport to track ridership and service schedules. Daily Logan Express ridership and operations data are submitted monthly to Massport. Massport maintains a Passenger Water Transportation Ridership Summary on a monthly basis. Massport maintains a continuing record, the Ground Transportation Unit (GTU) Daily Event Log, of all occurrences impacting the Airport roadways, terminal curbs, and access roads. This log cites such events as accidents, lane closures, bus delays, as well as routine and non-transportation events.

Table 9-1 West Garage Project Status Report (EEA #9790)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Measuring, Monitoring, and Evaluating Ground Access Improvements	
Monitor HOV Services (Logan Express, MBTA, water shuttle, limousine/bus, and taxi).	Massport's Ground Transportation Operations Center (GTOC) located in the Rental Car Center (RCC) is the 24/7 command center for all transportation information in and around Logan Airport. GTOC staff monitor up to the minute traffic information to ensure Logan Airport bus services are running efficiently.
Monitor passenger activity and employee modes of transportation.	**Implemented.** The *2019 Logan International Air Passenger Ground-Access Survey* was conducted in the spring of 2019 and is summarized in Chapter 5, *Ground Access to and from Logan Airport*. A new air passenger survey conducted in 2022 will provide early post-pandemic trends related to HOV mode shift. Results of this air passenger survey will be presented in the *2022 Environmental Status and Planning Report (ESPR)*.
Massport supports the use of Automated Vehicle Identification (AVI) to monitor, manage, and facilitate efficient traffic operations at Logan Airport and elsewhere on the regional transportation system.	**Implemented.** An AVI system for Massport's Logan Airport shuttles and Logan Express buses was implemented. All new buses are being procured with AVI/global positioning system (GPS), and are compatible with the "next bus" arrival notification system. In addition, the GTOC in the RCC is outfitted with the required equipment to track the unified bus fleet.
Track the effectiveness of ground access measures.	**Implemented.** Massport continues to track the effectiveness of its ground access mitigation programs in its annual Massachusetts Environmental Policy Act (MEPA) filings. See Chapter 5, *Ground Access to and from Logan Airport,* for 2020 and 2021 details.

Source: Massport.
Note: Text in *italics* detailing the mitigation measures is from Section IV, Mitigation of the West Garage Final EIR, January 31, 1995.

Table 9-2 describes the Alternative Fuel Program, which was part of the West Garage Section 61 commitments.

Table 9-2 Alternative Fuel Program — Details of Ongoing Section 61 Mitigation Measures for the West Garage Project (as of September 30, 2022)

Program Element	Projected Date of Completion/ Acquisition	Status
Purchase four electric passenger utility vehicles	Winter 1995	**Implemented.**
Purchase five electric sedans	Winter and Summer 1995	**Implemented.**
Build compressed natural gas (CNG) quick-fill station	Spring 1995	**Implemented.** The CNG station has been operational since 1995. It is one of New England's largest retail CNG quick fill stations and serves Massport CNG vehicles (22 of which are the Massport-owned 42-foot CNG buses) along with a dozen Airport tenants including nearby hotel CNG shuttle bus fleets. In 2020 and 2021, the station dispensed approximately 12,339 and 10,691 gasoline-gallon equivalents per month for Massport vehicles, respectively.
Purchase five electric buses	Spring and Summer 1995	**Implemented.** Massport purchased two electric buses and leased one that operated at Logan Airport between 1996 and 2001. After more than six years of testing and evaluation, those early electric buses were neither durable nor dependable enough to function effectively in the demanding airport operating environment. As electric vehicle (EV) technology continues to advance, Massport supports the use of alternative fuel vehicles (AFV) by replacing older fleet vehicles with alternative fuel fleet vehicles and continues operation of Massport's "Clean-Air-Cab" incentive program for AFVs. Massport's current focus is a continued transition to EV. Massport encourages conversion to AFVs/alternative power vehicles (APVs) by others through such policies as 50 percent discounts in AFV/APV ground access fees to limousines, vans, and buses; limited "front-of-line" taxi pool privileges to hybrid and AFVs/APVs; and preferred parking for hybrid and AFVs/APVs at Logan Airport parking facilities. As part of the ongoing Alternative Fuel Program, Massport facilitates the replacement of gas- and diesel-powered ground service equipment (GSE) with all-electric GSE (eGSE). Though this equipment is primarily owned and operated by the airlines and their service providers, we have a goal of transitioning all fossil-fueled GSE to eGSE, where commercially available. As of October 2022, 459 eGSE were in service at Logan Airport. The U.S. Environmental Protection Agency (EPA) awarded a grant in 2018 to Massport to replace some gas- and diesel-powered GSE at Logan Airport in a collaborative effort to reduce emissions and improve air quality. American Airlines will contribute the entire match and Massport will provide support in the way of grant administration and data tracking. This grant will allow Massport to replace 25 pieces of gas- and diesel-powered GSE with all-electric versions. This grant will be used in conjunction with a Federal Aviation Administration (FAA) Voluntary Airport Low Emission (VALE) grant Massport received in the fall of 2018 to install eGSE charging stations for the Terminal B Optimization Project. This VALE grant awarded funding for American Airlines' charging infrastructure at Terminal B to install 50 eGSE charging stations. In 2019, through the same program, Massport was awarded a grant for jetBlue Airways' charging infrastructure at Terminal C, Massport contributed toward the installation of 42 eGSE charging stations. Additionally, in 2019 Massport was awarded by the EPA under Diesel Emission Reduction Act (DERA) a grant to replace 44 diesel-powered GSE equipment with all-electric baggage tractors,

Table 9-2 Alternative Fuel Program — Details of Ongoing Section 61 Mitigation Measures for the West Garage Project (as of September 30, 2022) (Continued)

Program Element	Projected Date of Completion/ Acquisition	Status
Purchase five electric buses (*continued*)	Spring and Summer 1995	belt loaders, and push back tugs. GSE owners at Logan Airport will contribute a match. In 2019, Massport was awarded through the Massachusetts Department of Environmental Protection's (MassDEP's) Volkswagen Diesel Settlements & Environmental Mitigation Open Solicitation grant program, aimed at reducing nitrogen oxide (NO_X) and greenhouse gas (GHG) emissions, a grant to acquire eGSE in partnership with jetBlue Airways. This will replace 31 pieces of GSE with new eGSE and install four eGSE charging stations at Terminal C. United Airlines also privately pursed this grant and was awarded funding. In 2020, Massport was awarded a grant through FAA's VALE for charging infrastructure at Terminal E and Signature Aviation Building 14 to install 10 eGSE charging stations. Massport is also collaborating with the MassCEC to study opportunities to enable conversion of the ride-for-hire fleet (RideApp, Rental Car Taxi and limousine vehicles) that serves Logan to transition to electric vehicles. In early 2022, MassCEC provided a grant to initiate this work and provide some funding to increase Logan's EV charging infrastructure.
Purchase five electric pick-up trucks	Spring 1995	**Implemented.**
Use soy-blend diesel fuel	Spring 1995	**Implemented.** Massport's shuttle fleet operated on soy diesel from 1995 to 1999. In 1999, all the buses were replaced with CNG buses. This fleet was fully replaced in 2012 by CNG and clean-diesel/electric hybrid buses.
Purchase additional AFVs	Spring 1995	**Implemented.** Refer to Chapter 7, *Air Quality/Emission Reductions,* for a list of AFVs.
Purchase six CNG buses	Summer 1995	**Implemented.** The initial fleet of 26 CNG shuttle buses was fully replaced in 2012 with 32 60-foot clean diesel/electric hybrid buses and 18 42-foot CNG buses. Three CNG buses were added to the fleet in 2015, increasing the total from 18 to 21; and one additional CNG bus was added in 2016, increasing the total from 21 to 22.
Purchase four electric vans	Summer 1995	**Implemented.**
Install quick-charge kiosks for electric vehicles	Summer 1995	**Implemented.** At Logan Airport, Massport provides 102 landside EV charging ports with dedicated parking spaces. 48 of these ports are conveniently located near the terminals in the adjacent parking garages. 10 additional ports are located in the Economy Garage with free shuttle access to the terminals.
Develop slow-charge infrastructure	Ongoing	**Implemented.** The original electric charging infrastructure included 15 inductive charging locations. Currently, these are not in use because there are no vehicles using inductive charging. In 2012, Massport installed 13 Level 2 EV charging stations to accommodate a total of 26 vehicles in the Central Garage and Terminal B parking areas. The Framingham Logan Express Garage also has two EV charging stations. Massport plans to add EV charging infrastructure to all new parking facilities. Massport increased the availability of EV charging stations so that 150 percent of demand is available at all facilities at all times.

Source: Massport.

International Gateway Project (Terminal E) – EEA #9791

Permitting History:

- Certificate on the Final EIR issued on December 2, 1996.
- Section 61 Findings submitted to EEA on June 26, 1997.

Project Status

The International Gateway Project (**Figure 9-2**) expanded and upgraded Terminal E to provide better service to international passengers. The original Terminal E was opened in 1974 and over time became outdated and too small to accommodate the growth in international travel. This project is being constructed in phases:

- **Phase I – Complete.** This phase included a weather-protected outside airside bus portico with an elevator and escalator linking the ground floor to the second floor to accommodate passengers arriving on remotely parked aircraft (that are unable to park at a gate because it is occupied by another aircraft).
- **Phase II – Complete.** This phase enlarged Logan Airport's congested Federal Inspection Services (FIS) Facility and improved the meeter/greeter lobby and the Terminal E ticketing area to maximize passenger convenience and reduce processing times in the terminal. To reduce curb and roadway congestion at Terminal E, this project included a new separated roadway system for arrivals and departures.
- **Future Phase – Transitioned to Terminal E Modernization Project (EEA #15434).** The West Concourse element of the International Gateway Project and its three additional gates were approved but not constructed. These three gates are now included as Phase I of the ongoing Terminal E Modernization Project (see below).

Construction of Phases I and II of this project commenced in the summer of 1998. Phase I was completed in 2004. The departure level of the terminal, including the new ticketing hall and departure level roadway, opened in May 2003. Phase II Enlargement of the FIS Facility and construction of the new arrivals level was completed in July 2007. Preliminary work was completed for the West Concourse including planning for three additional contact gates that were not constructed. In 2017, Massport reconfigured three existing gates to be compatible with wide-body, double-deck aircraft such as the A-380. Additional information on the status of the International Gateway project is available in Chapter 3, *Airport Planning*.

As part of a separate project, Massport has approval for the modernization of Terminal E. The Terminal E Modernization Project will accommodate existing and forecasted long-range passenger demand for international service and will include the three permitted but not built gates from the West Concourse component of the International Gateway Project, as well as four additional new aircraft contact gates. An ENF was filed in October 2015. The Draft EIR/EA was filed in July 2016, and the Final EA/EIR was filed in September 2016. The FAA issued a FONSI on November 10, 2016, and a ROD on November 14, 2016 for the project (see Chapter 3, *Airport Planning,* for additional information). Initial construction began in 2019. Mitigation commitments associated with the Terminal E Modernization Project (EEA #15434) are discussed later in this chapter. Construction of the first four gates is underway.

Table 9-3 lists each of the continuing mitigation measures for the International Gateway Project in the Section 61 Findings, along with Massport's progress in achieving these measures through the end of September 2022. Many of the mitigation measures for this project have long since been implemented, but it is noted in the tables when there have been recent updates. Completed design and construction phase measures are described in previous EDRs.

FIGURE 9-2 International Gateway Project | **2020/2021 Environmental Data Report**

Note: Runway 14-32 construction completed in November 2006.

◆ International Gateway Project (Terminal E) - EEA #9791

0 500 1000 2000 Feet

Table 9-3 International Gateway Project Status Report (EEA #9791)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022)

Mitigation Measure	Status
Alternative Fuel Outreach Program	
Massport is working cooperatively with the U.S. Environmental Protection Agency (EPA) and regional utility providers in coordinating an ongoing outreach program aimed at promoting the use of clean-burning alternative fuels. This program, which is also supported by fuel providers, vendors, and state and federal agencies, will offer information to airport tenants in the following areas: ▪ *Notification of grant programs or other financial incentives for vehicle conversions.* ▪ *Assistance in cost-benefit analysis for conversion of conventionally fueled vehicles to Alternative Fuel Vehicles (AFVs).* ▪ *Assistance in placing airport tenants in contact with alternative fuel suppliers and product vendors.*	**Implemented.** Massport continues to work with the EPA, regional utility providers, and other stakeholders in evolving Logan Airport's fleets to alternative power sources. In line with current technologies, Massport's focus is on transitioning to electric vehicles (EV) where suitable replacement vehicles are available.
High Occupancy Vehicle (HOV) Promotion	
Massport will reserve terminal space for ground transportation ticket sales, reservations, and information.	**Implemented.** In a joint venture with the Massachusetts Bay Transportation Authority (MBTA), Charlie Card automated fare collection equipment was installed in all Logan Airport terminals in 2006. Since mid-2012, in an effort to encourage greater transit ridership, Massport continues to offer free boarding of the Silver Line at Logan Airport. Free Silver Line continued through the date of this report. In 2019, Massport added the Back Bay Logan Express to the "free from Logan" HOV program. Additional ground transportation information is provided on Massport's website at http://www.massport.com/logan-airport/to-from-logan/transportation-options/.
Attractive and distinctive signage and graphics will be utilized inside the terminal and out at the curb to clearly mark access to Logan Express, MBTA, water transportation, and other HOV options.	**Implemented.** Signage is installed in the terminal and at the curbside identifying HOV curb locations. In 2012, Massport installed new digital signage at all terminal Silver Line curb locations to indicate next bus wait times, which has improved passenger convenience.
As HOV services continue to develop and expand at Terminal E, Massport will expand its web page to encompass these new services and initiatives.	**Implemented.** Massport continues to reflect service changes on its website.
Massport and the MBTA will offer, on a trial basis, the sale of MBTA tokens via a vending machine in the baggage claim area of Terminal C.	**Implemented.** The MBTA Charlie Card machines are located at the MBTA's Blue Line Airport Station and in each of the Logan Airport passenger terminals. Massport continues to offer free service to Airport Station and the water shuttle dock with its fleet of compressed natural gas (CNG) and clean diesel/electric hybrid buses. Since the summer of 2012, Massport continues to sponsor free rides on the Silver Line from Logan Airport to downtown Boston. In 2019, Massport added the Back Bay Logan Express to the "free from Logan" HOV program.

Source: Massport.
Note: Text in *italics* detailing the mitigation measures is excerpted from the Section 61 Findings submitted to EEA, June 26, 1997.

Replacement Terminal A Project – EEA #12096

Permitting History

- Certificate on the Final EIR issued on November 16, 2000.
- Section 61 Findings submitted to EEA on August 31, 2001.

Project Status

The Replacement Terminal A Project (**Figure 9-3**) replaced the original Terminal A with a main terminal linked to a satellite concourse. The new Terminal A opened on March 16, 2005.

In the spring of 2006, Delta Air Lines and Massport submitted an application for certification of Terminal A under the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED®) Green Building Rating System™. LEED certification was awarded in June 2006, making Terminal A the first airport terminal in the world to be awarded LEED certification.

The following sustainable elements were incorporated into Terminal A:

- **Water conservation** – low-flow toilets and drip, rather than spray, irrigation.
- **Atmosphere protection** – zero use of chlorofluorocarbon-based, hydrochlorofluorocarbon-based, or halon refrigerants.
- **Energy conservation** – special roofing and paving materials that reflect solar radiation. Solar panels were installed on the roof of Terminal A in 2012.
- **Materials and resources conservation** – more than 10 percent of all the building materials used to construct the terminal were from recycled materials.
- **Enhanced indoor environmental air quality** – low and volatile organic compound (VOC) free adhesives, sealants, paints, and carpets.
- **Sustainable sites** – bicycle racks.

Table 9-4 lists each mitigation measure in the Section 61 Findings along with Massport's progress in achieving these measures through the end of September 2022.

FIGURE 9-3 Replacement Terminal A Project | **2020/2021 Environmental Data Report**

◆ Terminal A Replacement Project - EEA #12096

0 450 900 1800 Feet

Table 9-4 Replacement Terminal A Project Status Report (EEA #12096)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022)

Mitigation Measure	Status
Project Design Mitigation	
Logan Transportation Management Association (TMA) Participation	
Delta Air Lines, Inc. to join Massport's Logan TMA and designate an Employee Transportation Advisor.	**Implemented.** Delta Air Lines joined the Logan TMA and designated an Employee Transportation Advisor.
Additionally, Delta Air Lines will provide the following services as part of their Transportation Demand Management Program through the Logan TMA Transportation subsidy for full-time Delta Air Lines employees at Logan Airport; ride matching/carpooling; vanpooling; guaranteed ride home; preferential parking for high occupancy vehicles (HOVs); shuttle to and from employee parking.	**Implemented.** Transportation Demand Management (TDM) services are provided through Delta Air Lines and the Logan TMA.
Recycling Program	
The Replacement Terminal A will be included in Massport's terminal recycling program.	**Implemented.** In 2013, Massport converted to single-stream recycling in all terminals. Massport established aggressive recycling goals as part of its 2015 *Logan Airport Sustainability Management Plan (SMP)* and is actively working to reduce waste and increase its recycling rate. As part of this effort, Massport installed liquid diversion stations at the security checkpoint for Terminals A, B, C, and E in the spring of 2016. Passengers are now able to empty their bottles before security and re-fill them again on the secure side for the remainder of their journey.
High Occupancy Vehicle (HOV) Promotion	
HOV access can be accommodated on the departures level and will be designated near main entrances to the terminal building to ensure efficient and convenient unloading by air passengers who use these mode-types to access the Airport. *The inner-most curb of [the arrivals level] will be designated exclusively for HOVs and taxis, similar to the departures level.*	**Implemented.** HOV modes have preferential access to Terminal A for passenger convenience at both the arrival and departure levels. Coinciding with the opening of the Rental Car Center (RCC) (and its new on-Airport shuttle bus operations), in September 2013, Massport made improvements to the terminal curbsides to increase access for HOV, transit, and shared-ride modes. The improvements followed several general principles: situate HOV modes to the curb closest to the terminal and locate the Airport's Blue Line/RCC shuttle stop adjacent to the Silver Line stop. Terminals B, C, and E underwent the most significant changes; in fact, the ground level of the Terminal B garage was converted to a taxi and limousine (and subsequently the RideApp pick-up area, eliminating all commercial parking from that level, and allowing extra curb space to be better allocated among the remaining HOV and other modes. Terminal A, which already had the primary HOV modes pick-up at the terminal curb (and private vehicles pick-up at the second/outer curb), underwent the fewest changes (notably relocating the Silver Line bus stop to be adjacent to the Blue Line/RCC shuttle stop). The curb improvements also included adding electronic "next bus arrival time" displays for the Massport shuttles, Massachusetts Bay Transportation Authority (MBTA) Silver Line, and Logan Express buses.

Table 9-4 Replacement Terminal A Project Status Report (EEA #12096)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Ground Service Equipment (GSE) Conversion	
In conjunction with the Project, Delta Air Lines will implement a program for conversion of its entire GSE fleet at Terminal A as soon as viable alternative fueled fleet vehicles become available and can be effectively integrated into Delta Air Lines' operations at Terminal A. Delta Air Lines will introduce battery powered baggage tugs and belt loaders with the replacement terminal and convert this portion of the GSE fleet by the end of 2008. This represents over 40 percent of Delta Air Lines' current GSE fleet.	**Implemented.** Terminal A incorporates infrastructure for GSE charging. In September 2009, Massport approved a 3-million-dollar loan to Delta Air Lines for the purchase of battery-powered baggage tugs and battery powered-baggage conveyor belt vehicles. Delta Air Lines purchased 50 electric baggage cart tugs, 25 electric baggage conveyor belt vehicles, and charging stations for each vehicle. Thirty-two GSE chargers are currently serving electric GSE. Massport is facilitating the replacement of gas- and diesel-powered GSE with electric equivalents, as commercially available.
Delta Air Lines will also examine the feasibility of locating a Compressed Natural Gas (CNG) fill station at Terminal A. The availability of a CNG fueling station would facilitate conventionally-fueled vehicles to be replaced with CNG-fueled vehicles where this vehicle option is offered. Delta Air Lines will introduce these vehicles into its GSE fleet as soon as they become available and are determined to be feasible and practicable for use at Terminal A.	**Implemented.** Delta Air Lines examined the feasibility of locating the CNG fill station at Terminal A and determined it to be infeasible, given that the GSE conversions are trending toward electric vehicles and electric vehicle infrastructure. A public access CNG fuel facility is available on the Airport at 81 North Service Road. Massport is facilitating the replacement of gas- and diesel-powered GSE with electric equivalents, as commercially available. Massport is advancing plans to extend the infrastructure for plug-in GSE to other locations.
Where new alternative fuel vehicles (AFVs) are developed and determined to be cost effective and in available supplies, Delta Air Lines will integrate their use into its Terminal A GSE fleet operations.	**Implemented.** As described earlier, Delta Air Lines has electric baggage tugs and belt loaders and will continue to determine the feasibility of integrating other electric GSE, as available. Massport is facilitating the replacement of gas- and diesel-powered GSE with electric equivalents, as commercially available.
Finally, Delta Air Lines will provide Massport with an annual status report/update on the GSE conversion program at Terminal A, for inclusion in Massport's annual Environmental Data Report (EDR).	**Implemented.** Terminal A includes 32 electric charging stations for Delta Air Lines' electric ramp vehicles. As part of an Airport-wide initiative, Massport is facilitating the replacement of gas- and diesel-powered GSE with electric equivalents, as commercially available.
Operational Mitigation Measures	
Minimizing nighttime movement of aircraft to and from hardstand positions.	**Implemented.** In accordance with the Noise Rules, Massport continues to restrict nighttime movement of aircraft under its own power between 10:00 PM and 7:00 AM, and Massport also requires towing during this time period.

Table 9-4 Replacement Terminal A Project Status Report (EEA #12096)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Using single engine taxiing and pushback to the extent feasible and practicable, recognizing that such use is always at the discretion of the pilot in charge of the aircraft based upon his or her experience and safety and operational considerations.	**Implemented.** Massport annually issues letters to air carriers in support of single engine taxiing when consistent with safety procedures. Massport is an active member of the Federal Aviation Administration (FAA) Partnership for Air Transportation Noise and Emissions Reduction (PARTNER) program on reducing noise and emissions. A 2010 Massachusetts Institute of Technology (MIT) paper (as provided in the *2010 EDR*) confirmed earlier Massport survey findings that single engine taxiing is an important operational measure used by airlines to conserve fuel and is extensively used at Logan Airport. Based on those findings, Massport has tailored ongoing communication to airlines to further encourage the use of single engine taxiing, when safe to do so, within the Logan Airport operational context.
Testing alternative de-icing methods to reduce the amount of glycol usage.	**Ongoing.** Delta Air Lines participated in the *Logan Deicer Management Feasibility Study* to evaluate alternatives to reduce discharges to Boston Harbor. The study report was submitted to the U.S. Environmental Protection Agency (EPA) in 2017.

Source: Massport.
Note: Text in *italics* detailing the mitigation measures is excerpted from the Section 61 Findings submitted to EEA, August 31, 2001.

Logan Airside Improvements Planning Project – EEA #10458

Permitting History

- Certificate on the FEIR issued on June 15, 2001.
- Section 61 Findings, dated June 8, 2001, on the Final EIR.
- In June 2002, FAA filed a Final Environmental Impact Statement (Final EIS) and issued the federal ROD in August 2002 approving a unidirectional runway and other improvements, but deferred a decision on the centerfield taxiway pending additional review by FAA.
- In November 2003, the Superior Court of the Commonwealth modified a 1976 injunction prohibiting construction of a new runway at Logan Airport, pending further environmental review. The injunction modification allowed construction of the runway in accordance with the Secretary of EEA's Certificate on the FEIR and FAA's ROD on the Final EIS.
- In accordance with the Secretary of EEA's Certificate on the FEIR, Massport amended its final Section 61 Findings issued in 2001 to incorporate mitigation measures added or refined through the federal environmental review process. As a result, Massport amended its initial Section 61 Findings on October 21, 2004, to include mitigation measures required in FAA's ROD.
- In April 2007, FAA issued a ROD on the centerfield taxiway improvements based on its review of supplemental information.

Project Status

- Runway construction commenced in 2004. Runway 14-32 opened on November 23, 2006. The first full year of operation of Runway 14-32 was 2007.
- Realignment of the southwest corner taxiway system was completed in 2007.
- Taxiway D extension was completed in 2010.
- Taxiway N realignment remains under consideration for a future action.
- Reduction in approach minimums on Runway 15R and 33L were implemented in 2013 following completion of the 33L Light Pier replacement and FAA testing of new Instrument Landing System (ILS) equipment.

The Logan Airside Improvements Planning Project (**Figure 9-4**) involved the construction of a new unidirectional Runway 14-32 and centerfield taxiway, extension of Taxiway D, realignment of Taxiway N, improvements to the southwest corner taxiway system, and reduction in approach minimums on Runways 22L, 27, 15R, and 33L. Reduction in approach minimums on Runway 15R and 33L were approved in the EIS. However, implementation for approach minimum reductions depended upon realignment of the ILS. The construction impacts of relocating the ILS localizer and new Category III ILS equipment were addressed in the environmental review of the RSA enhancements for Runway 33L (EEA #14442). The Category III ILS began operations in 2013.

Table 9-5 summarizes the mitigation measures contained in the amended Section 61 Findings issued on October 21, 2004 and reports on the status of implementation. **Table 9-5** addresses only ongoing requirements, and it is noted when there are recent updates. Documentation on design and construction measures is provided in previous EDRs.

FIGURE 9-4 Logan Airside Improvements | **2020/2021 Environmental Data Report**

Note: Runway 14-32 construction completed in November 2006

◆ Improved Taxiways

● Reductions in Approach Minimums

0 500 1000 2000 Feet

Table 9-5 Logan Airside Improvements Planning Project (EEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022)

Mitigation Measures	Status
Runway 14-32 Operations and Construction Mitigation	
Operational procedures for unidirectional Runway 14-32 will include over-water flight operations only, arrival operations in east-to-west direction from Runway 32 approach end, and departure operations from west-to-east direction from the Runway 14 departure end. Massport will enter into contract with appropriate government body and/or community group(s) to enforce intended unidirectional runway, if requested. Lighting, marking, and instrumental components of Runway 14-32 will be designed for a unidirectional runway. No parallel or other type taxiway facility will be constructed to allow east-to-west direction departures from the Runway 32 end. *The Federal Aviation Administration (FAA) endorsed the unidirectional limitations on Runway 14-32 and has agreed to develop air traffic control procedures to ensure safe and efficient operation of the unidirectional limitation, subject to variances that may be required to accommodate particular aircraft emergencies.*	**Implemented.** Runway 14-32 was constructed for unidirectional operation. All lighting, marking, and navigational instrumentation was constructed and is operated for unidirectional use only. There is no parallel or other type of taxiway facility that would facilitate east-to-west direction departures from the Runway 32 end. The construction mitigation measures were incorporated into the final design specifications and were implemented during construction. Runway 14-32 opened on November 23, 2006.
Wind-Restricted Use of Runway 14-32	
Restrict the use of Runway 14-32 to those times when winds are equal to or greater than 10 knots from the northwest or southeast (between 275 degrees and 005 degrees, or 095 degrees and 185 degrees, respectively).	**Implemented.** Massport provided initial data to support the FAA's effort. FAA implements the wind restriction in compliance with the federal Record of Decision (ROD).
Mitigation Policies/Programs	
Regional Transportation Policy	
Engage in promoting increased utilization of regional airports. *Cooperative transportation planning with the various transportation agencies to ensure an integrated regional transportation infrastructure (i.e., improved highways, public transportation, high-speed rail, private transportation services to improve regional airport access).*	**Implemented.** Please refer to Chapter 4, *Regional Transportation*, for updated information on regional transportation efforts.
Massport will continue to exercise operational control over Worcester Regional Airport.	**Implemented**. Massport exercised operational control over Worcester Regional Airport as part of its agreement with the City of Worcester, which went into effect on January 15, 2000. In April 2004, Massport and the City of Worcester agreed to a three-year extension of the Operating Agreement, extending Massport's operation of Worcester Regional Airport through June 2007. Subsequently, both parties agreed to a further extension. Legislation was passed in 2009 requiring Massport to assume ownership of Worcester Regional Airport. Massport's ownership of Worcester Regional Airport commenced on July 1, 2010.

**Table 9-5 Logan Airside Improvements Planning Project (EEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)**

Mitigation Measures	Status
Regional Transportation Policy	
Massport will continue to attract new air service to Worcester Regional Airport.	**Implemented.** Massport works with carriers and makes other facility improvements to develop and sustain commercial service from Worcester. Massport already initiated a $100-million 10-year investment to revitalize and grow commercial operations at Worcester Regional Airport. As a result of this collaboration, jetBlue Airways has already handled over 600,000 passengers at Worcester Regional Airport since commencing operations in late 2013, serving two Florida destinations. Starting in May 2018, jetBlue Airways offers flights to John F. Kennedy International Airport in New York, New York. American Airlines began offering flights to Philadelphia International Airport starting October 2018. Delta Air Lines commenced service between Worcester and Detroit in the summer of 2019. In 2020, in response to COVID, all three airlines temporarily suspended service in and out of Worcester Regional Airport. In 2021, American Airlines, JetBlue, and Delta Air Lines resumed service out of Worcester Regional Airport.
Traveler and air service awareness will be provided to Worcester Regional Airport via marketing campaigns.	**Implemented.** Massport continues to aggressively market the Airport to potential commercial air service carriers. Massport worked with jetBlue Airways to begin service out of Worcester Regional Airport in November 2013. jetBlue Airways currently serves two Florida destinations from Worcester. jetBlue Airways recently commenced service between Worcester Regional Airport and John F. Kennedy International Airport in 2018. Delta Air Lines commenced service between Worcester and Detroit in the summer of 2019. In 2020, in response to COVID, all three airlines temporarily suspended service in and out of Worcester Regional Airport. In 2021, American Airlines, jetBlue, and Delta Air Lines resumed service out of Worcester Regional Airport.
Develop and maintain an aviation information database to include: aviation trend tracking reports for distribution to interested parties; statistical summaries of passenger levels, aircraft operations and airline schedule data at major New England regional airports; include a summary of regional airport trends and service developments in an Annual Report.	**Implemented.** Massport collects regional airport data. A summary of individual airport activity is published annually in the Environmental Data Reports (EDRs) and Environmental Status and Planning Reports (ESPRs).
Participate in other regional/state aviation forums.	**Implemented.** Please refer to Chapter 4, *Regional Transportation*, for updated information on regional transportation efforts.
Continue to work with FAA/regional airport directors to complete a New England Airports System Study to evaluate regional airports performance. FAA committed to work with other participants in the preparation of the study.	**Implemented.** The New England Regional Airport System Plan (NERASP) study was published in October 2006.

**Table 9-5 Logan Airside Improvements Planning Project (EEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)**

Mitigation Measures	Status
Regional Transportation Policy	
Encourage transportation initiatives (i.e., commuter rail, rail or other links between regional airports) by relevant agencies or other governmental bodies through Transportation Bond Bill or other legislative initiatives to implement an improved effective regional transportation system.	**Implemented.** Massport continues to support regional transportation legislation and funding for other modes of transportation including the Massachusetts Bay Transportation Authority (MBTA) Silver Line and water transportation.
Continue to support inter-city rail planning through the Boston Metropolitan Planning Organization (MPO).	**Implemented.** Massport is an active member of the Boston MPO and contributes to the policy discussions in all modes of transportation.
Allow Massport's Logan Express satellite parking lots and stations available for third-party bus and park-and-ride connections to other regional airports, including Worcester, Manchester, and Providence.	**Implemented.** Upon request and review, Massport will continue to allow third party bus operators to provide service to regional airports from Logan Express facilities. In 2007, Massport enacted an agreement with Manchester-Boston Regional Airport to allow operation of a shuttle service between Manchester-Boston Regional Airport and the Anderson Regional Transportation Center (RTC) in Woburn. That pilot program was replaced by hourly van service in 2008.
Sound Insulation	
Sound insulation is being provided within the Boston Logan Airside Improvements Planning Project Mitigation Contour including the affected residences of Chelsea, East Boston, Winthrop, and Revere. Through special project mitigations, FAA funding will be provided for residences with building code considerations to allow for the necessary upgrades thereby ensuring eligibility and participation in the sound insulation program. If FAA funding is unavailable to complete sound insulation to residences within the Day-Night Average Sound Level (DNL) 65 decibel (dB) contour as a result of project implementation, Massport will provide the funding.	**Implemented.** Sound insulation was implemented in full compliance with state and federal regulatory requirements and mitigation commitments. Since 1986, Massport has sound insulated 5,467 residences, totaling 11,515 dwelling units. See Chapter 6, *Noise Abatement,* for additional details on sound insulation.
Preferential Runway Advisory System (PRAS)	
Massport will develop and implement a PRAS monitoring system and a new distribution system for reporting that will expand the contents of Massport's Quarterly Noise Reports and will involve the expansion of the distribution list to include the Logan Airport Citizens Advisory Committee (CAC). Runway utilization, dwell, and persistence reports will be included in the Environmental Status and Planning Report (ESPR) filings with the Massachusetts Environmental Policy Act (MEPA). Massport will continue to work with FAA to design additional reports to enhance the attainment of PRAS and Massport will begin to work with CAC to update PRAS. The current PRAS system will remain in place until superseded.	**Implemented.** Massport, the FAA, and the Logan Airport CAC initiated a noise study of Logan Airport. PRAS review and reporting was incorporated into the noise study. During Phase II of the ongoing Boston Logan Airport Noise Study (BLANS), the Logan Airport CAC voted to abandon PRAS because it had not achieved the intended noise abatement. Phase III of the BLANS focused on the development of an updated Runway Use Program. Operational tests of a new program began in November 2014 and continued through September 2016. The BLANS project ended in 2016 without the Logan Airport CAC agreeing on a new Runway Use Program. A final BLANS project report was issued in April 2017. For additional information, refer to Chapter 6, *Noise Abatement*. Runway utilization, dwell, and persistence reports continue to be included in the annual ESPR and EDR filings.

**Table 9-5 Logan Airside Improvements Planning Project (EEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)**

Mitigation Measures	Status
Noise Abatement Study	
FAA has committed to undertake a noise abatement study that will include enhancing existing or developing new noise abatement measures applicable to aircraft overflight impacts, which will take into account environmental benefit, operational impact, aviation safety and efficiency, and consistency with applicable legal requirements. The scope of this study has been completed through the joint efforts of FAA, the CAC, and Massport as required by the ROD. Massport will work with the CAC and FAA to assess the existing PRAS at Logan Airport in accordance with Section 10.0 of the Section 61 Findings and will continue to participate in the noise study as contemplated in the ROD.	**Implemented.** The FAA, in conjunction with Massport and the Logan Airport CAC, initiated the Boston Overflight Noise Study (BONS). Phase I of the study, completed in early 2007, defined and sought to implement changes to flight tracks to minimize impacts from aircraft overflights, which do not require a detailed Environmental Assessment (EA). Federal funding for Phase II was requested early to ensure seamless continuation of the study and transition. Phase II of the BLANS was completed in 2012. It addressed additional noise abatement alternatives that will require detailed analysis to meet FAA environmental requirements. Massport is working with the Logan Airport CAC and the FAA on Phase III of the BONS Study to design a runway use plan for the Airport. The Logan Airport CAC could not agree on a runway use program and Phase III was completed in August 2012. A final BLANS project report was issued in April 2017.
Peak Period Monitoring and Demand Management Program (DMP)	
Massport will develop and implement a Peak Period Pricing (PPP) program or an alternative DMP. Massport will identify standards to allow airlines to accurately predict scheduling costs and modify accordingly. Massport will establish and maintain a monitoring system. *Massport will comply with its commitments with respect to PPP or alternate DMP. FAA has indicated in the ROD that it stands ready to assist Massport in this endeavor.*	**Implemented.** In July 2004, Massport filed a proposed rule with the Office of the Massachusetts Secretary of State to formally initiate the state rulemaking process and public review to establish a peak period surcharge during designated peak delay periods at Logan Airport. The public comment period ran through November 15, 2004, during which Massport conducted two public hearings. The Massport Board voted to establish the peak period surcharge program on January 16, 2005, and the program has been in place since then (see 740 Code of Massachusetts Regulations [CMR] 27.03). Please refer to Appendix K, *Peak Period Pricing Monitoring Reports*, for additional details.
Single Engine Taxi Procedures	
Develop and implement a program designed to maximize the use of single engine procedures by all tenant airlines, consistent with safety requirements, pilot judgment and federal law requirements.	**Implemented.** Massport supports the use of single engine taxiing when it can be done safely, voluntarily, and at the discretion of the pilot. Massport is an active member of the FAA Partnership for Air Transportation Noise and Emissions Reduction (PARTNER) program on reducing noise and emissions. In 2009, Massport facilitated a more detailed survey of pilots at Logan Airport by the Massachusetts Institute of Technology (MIT) to better understand the use of single engine taxiing. MIT completed its survey and issued a paper in March 2010 (as provided in the *2010 EDR*). The MIT survey confirmed earlier Massport survey findings that single engine taxiing is an important operational measure used by airlines to conserve fuel and is extensively used at Logan Airport. Massport issued letters in to air carriers and fully supports single engine taxiing when consistent with safety procedures.

**Table 9-5 Logan Airside Improvements Planning Project (EEA #10458)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)**

Mitigation Measures	Status
Report on Progress of Logan Transportation Management Association (TMA)	**Implemented.** Chapter 5, *Ground Access to and from Logan Airport,* discusses the Logan TMA and Massport efforts to increase high occupancy vehicle (HOV) access to Logan Airport. The continued focus is on broadening HOV options for all Logan Airport employees and actively participate in Transportation Demand Management (TDM) strategies. A local "Sunrise Shuttle" has been operating since 2007.

Source: Massport.

Note: The mitigation measures in *italics* are those that were referenced in FAA's ROD and later incorporated into the Section 61 Findings amended on October 21, 2004.

Southwest Service Area (SWSA) Redevelopment Program, EEA #14137

Permitting History

- Certificate on the FEIR issued on May 28, 2010.
- Section 61 Findings submitted to EEA on June 29, 2010.

Project Status

Massport completed the major element of the SWSA program, the consolidated Rental Car Center (RCC), in 2014. In addition to customer service benefits, consolidation of the rental car operations and their shuttle buses into one coordinated operation has resulted in reduced vehicle miles traveled (VMT) and reduced air emissions. See Chapter 5, *Ground Access to and from Logan Airport*, for additional information on VMT reductions.

Construction of enabling projects commenced in late summer of 2010 and final design of the facility continued through 2011. Although there was a phased opening, by the end of 2015, the project was completed and fully operational. Logan Airport's 21 CNG buses and 32 clean diesel/electric buses have fully replaced the entire fleet of diesel rental car shuttle buses that previously served the individual rental car companies. An additional CNG bus was put into service in 2016, increasing the total to 22 CNG buses. The RCC was awarded Logan Airport's first LEED® Gold certification in 2015.

Table 9-6 outlines Section 61 mitigation commitments of the SWSA Redevelopment Program, which Massport, the construction contractors, and the rental car companies have implemented as part of the design, construction, and operation of the facility. This project is now complete, and measures that were completed in the design and construction phase will no longer be tracked in the EDR/ESPR. The *2017 ESPR* presents the last full summary of those measures. Ongoing Section 61 commitments will continue to be updated annually, as appropriate.

Table 9-6 Southwest Service Area (SWSA) Redevelopment Program (EEA #14137) Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022)

Mitigation Measure	Status
Noise Reduction Measures	
Eliminate individual rental car shuttle buses and combine Massport Airport Station buses (routes 22/33/55) through the Unified Bus System; thereby, reducing the overall number of rental car-related buses circulating on-Airport and associated noise.	**Implemented.** Massport purchased a new bus fleet which was put into operation in 2012. The new bus fleet, comprising 21 compressed natural gas (CNG) buses and 32 clean diesel/electric buses, has fully replaced the entire fleet of diesel rental car shuttle buses with the Rental Car Center (RCC) opening in 2013. One additional CNG bus was put into service in 2016, increasing the total from 21 to 22 buses.
Airport Transportation System Improvements	
Reduce the rental car shuttle bus fleet by approximately 70 percent through the creation of the Unified Bus System when compared to the 2007 Existing Condition and future No-Build/No-Action Conditions.	**Implemented.** Massport purchased a new Unified Bus Fleet of diesel/electric hybrid and CNG buses. The initial buses were put into operation in 2012. Full implementation of the new bus fleet occurred when the RCC opened in the fall of 2013.
Reduce rental car shuttle bus terminal curbside congestion through the creation of the Unified Bus System resulting in reduced emissions.	**Implemented** upon project opening. Massport purchased a new Unified Bus Fleet which was put into initial operation in 2012.
Utilize clean- and low-emission fuel for the Unified Bus System to further reduce emissions.	**Implemented** upon project opening. Massport has purchased a new Unified Bus Fleet. The new fleet is comprised of diesel/electric hybrid and CNG buses.
Install Intelligent Transportation System features, as part of the Unified Bus System to further reduce emissions and improve operational efficiency.	**Implemented** upon project opening. Massport purchased a new Unified Bus Fleet which was put into initial operation in 2012.
Implement new wayfinding signage to increase the efficiency of the circulating vehicles within and around the SWSA.	**Implemented** upon project opening.
Pedestrian and Bicycle Facilities	
Provide new pedestrian and bicycle facilities, including secure and covered bicycle storage at the Customer Service Center (CSC) and Quick Turnaround Areas (QTA) buildings for employees, customers, and the general public, as well as shower/changing facilities within the QTA buildings for employees.	**Implemented.**
Provide enhanced pedestrian connections to and from the SWSA, airport terminals, the Logan Office Center, Memorial Stadium Park, Bremen Street Park, the Harborwalk, on-Airport buses, public transit (Massachusetts Bay Transportation Authority (MBTA) Airport Station), along Porter Street, and surrounding East Boston neighborhoods.	**Implemented.**
Provide street and pedestrian-level lighting and advanced warning signals and/or systems at crosswalks.	**Implemented.**

Table 9-6 Southwest Service Area (SWSA) Redevelopment Program (EEA #14137) Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Transportation Demand Management (TDM) Plan	
Provide limited SWSA employee parking on-site.	**Implemented.**
Provide new access to public transit through the Unified Bus System (direct connection to MBTA Blue Line at Airport Station) and new/enhanced pedestrian facilities at the station.	**Implemented.**
Require rental car companies to participate in the Logan Transportation Management Association (TMA).	**Implemented.** This requirement is included in the RCC tenant leases.
Alternative-Fuel Vehicles	
The rental car companies would provide fuel-efficient and/or alternative-fueled rental vehicles (quantity to be determined by the rental car companies).	**Implemented.** This requirement is included in the RCC tenant leases.

Source: Massport.
Note: The mitigation measures in *italics* are those that were referenced in FAA's ROD, and later incorporated into the Section 61 Findings as amended on June 29, 2010.

Logan Airport Runway Safety Area (RSA) Project – EEA #14442

Permitting History

- Certificate on the Final EA/EIR issued on March 18, 2011.
- FAA issued a FONSI on April 4, 2011, which documents that the proposed federal action is consistent with the National Environmental Policy Act of 1969 (NEPA) and other applicable environmental requirements and will not significantly affect the quality of the human environment with the mitigation requirements referenced in **Table 9-7**.
- Section 61 Findings were submitted to EEA on May 27, 2011 and published in the *Environmental Monitor* on June 8, 2011.
- Certificate on the Notice of Project Change (NPC) for the replacement of the Runway 33L approach light pier was issued on March 9, 2012.
- On April 12, 2012, the FAA found that the replacement of the Runway 33L approach light pier was a Categorical Exclusion and thus exempt from further consideration under NEPA.

Project Status

- Runway 33L RSA construction commenced in June 2011 and was completed in November 2012.
- Replacement of the Runway 33L approach light pier commenced in July 2012 and was completed in November 2012. The upgraded Category III system was put in service in 2013.
- The Runway 22R improvements were completed in 2014.

As described in previous EDRs/ESPRs, Massport has periodically undertaken RSA improvements and other safety improvements on the Logan Airport airfield. Massport completed safety improvements for Runways 22L, 4L/4R, and 27 under EEA #5122. In 2005, Massport undertook safety improvements at Runway 22R with the construction

of an Engineered Materials Arresting System (EMAS) bed at the end of the runway in compliance with FAA directives, although no MEPA review was needed. In 2006, as part of a separate project, Massport installed an EMAS bed at the Runway 33L End. This project considered further safety enhancements to the Runway 33L and Runway 22R RSAs. Massport prepared a combined EA in accordance with NEPA and an EIR in accordance with MEPA for the proposed enhancements at the Runway 33L and Runway 22R RSAs. The ENF was filed with MEPA on June 30, 2009, and the Draft EA/EIR was submitted to the FAA and EEA on July 15, 2010. The Final EA/EIR was submitted to the FAA and EEA on January 31, 2011. **Figure 9-5** shows the location of the RSA projects at Logan Airport.

The Runway 33L RSA improvements include a 600-foot long RSA with an EMAS bed, portions of which are on a 460-foot long by 300-foot wide pile-supported deck extending over Boston Harbor. Additional elements of the RSA improvements include two emergency access ramps located on either side of the deck and relocation of the perimeter access road. Construction of the pile-supported deck was completed in November 2012.

The Runway 33L RSA project replaced the inner 500 feet of the existing light pier. As construction progressed on the Runway 33L RSA improvements, Massport determined that it would be feasible to replace the remaining Runway 33L approach light pier. In the summer of 2012, Massport began replacing approximately 1,900 feet of the existing timber light pier that extends approximately 2,400 feet southeast of Runway End 33L. The existing timber pier was replaced with a new concrete structure along the runway centerline, approximately 10 feet south of the old pier, using concrete pilings. The in-kind replacement reduced the total number of pilings significantly (from over 500 to approximately 150). As part of the reconstruction, the new light pier was also constructed to accommodate upgraded navigational aids. The pier improvements provide the infrastructure necessary to support navigational aids that facilitate implementation of the reduced aircraft approach minimums previously reviewed and approved by the FAA in a ROD dated August 2, 2002, for the Logan Airside Improvements Planning Project (Airside Project) (EEA #10458). Massport filed an NPC with MEPA for the proposed light pier replacement on January 31, 2012. On March 9, 2012, the Secretary of the EEA issued an NPC Certificate determining that no further MEPA review was required for the light pier replacement. On April 12, 2012, the FAA found that the replacement of the Runway 33L approach light pier was eligible for a Categorical Exclusion and thus exempt from further review under NEPA.

The Runway 22R improvements that were completed in 2014 enhanced the existing RSA at this location by constructing an ISA similar to the ISA constructed at the Runway 22L end. Construction of the Runway 22R ISA is completed. **Table 9-7** lists the Section 61 mitigation commitments for the Logan Airport RSA Project and Massport's progress in achieving these measures.

FIGURE 9-5 Runway End Safety Improvements | **2020/2021 Environmental Data Report**

◆ Runway End Safety Improvements

0 500 1000 2000 Feet

Table 9-7 Logan Airport Runway Safety Area Improvement Program (EEA # 14442) Section 61 Mitigation Commitments to be Implemented (as of September 30, 2022)

Mitigation Measure	Status
Protected Resources	
Eelgrass (Runway-End 33L Only)	
Develop a mitigation program that will replace lost eelgrass area and functions by creation of new eelgrass, at a 3:1 replacement to loss ratio.	**Implemented.** Eelgrass was transplanted in 2011, but did not survive through 2012. In 2013, state and federal agencies agreed that Massport's implementation of a conservation mooring program would be a suitable replacement alternative to the initial eelgrass transplant. In 2015, Massport completed the replacement of nearly 240 traditional moorings, located in eelgrass habitat, with conservation moorings. The moorings are located in Boston and four other Commonwealth harbors. Under contract to Massport, the Massachusetts Division of Marine Fisheries (MassDMF) conducted monitoring of the installations in 2014, 2015, 2016, 2017, and 2018. MassDMF completed the fifth and final monitoring report in 2019; the final report was filed in the spring of 2020.
Salt Marsh (Runway-End 22R Only)	
Restore new salt marsh at a 2:1 replacement to loss ratio.	**Implemented** as part of Runway 22R habitat mitigation at Rumney Marsh. Construction was completed in 2016.
Monitor compensatory salt marsh for success and invasive plant species, and implement an invasive species control plan.	**Implemented** upon completion of Runway 22R habitat mitigation at Rumney Marsh in 2017. Annual monitoring and agency reporting continued through 2021.
Shellfish	
Monitor pilings and substrate at Runway 33L.	**Implemented.** Monitoring was conducted in the summers of 2013, 2014, 2015, and 2017. Based on the 2017 monitoring report, the Massachusetts Department of Environmental Protection (MassDEP) determined that this mitigation commitment had been satisfied and that no further monitoring is required.
Restore approximately 1.1 acres of habitat.	**Implemented** as part of habitat mitigation at Rumney Marsh.
Harvest and transplant shellfish from the footprint of the Runway 22R Inclined Safety Area (ISA).	**Not Implemented.** MassDMF identified a risk of shellfish disease in the Logan Airport flats, including Runway 22R, and determined that the shellfish should not be relocated.
Execute Memorandum of Agreement (MOA) with the Massachusetts Division of Marine Fisheries for resource enhancement.	**Implemented.** A MOA with MassDMF was executed on July 30, 2012 and all requirements of the MOA have been implemented.
State-Listed Rare Species	
Identify equivalent area of pavement for removal to maintain area of available habitat at Logan Airport for the upland sandpiper if required by the Massachusetts Natural Heritage and Endangered Species Program.	**Implemented.** The Massachusetts Natural Heritage and Endangered Species Program (NHESP) determined that construction time-of-year restrictions will avoid impacts to state-listed species. The seasonal restrictions were implemented in 2018 during construction of Taxiway C-1.

Source: Massport.
Note: The mitigation measures in *italics* are those that were referenced in FAA's ROD and later incorporated into the Section 61 Findings as amended on May 27, 2011.

Terminal E Modernization – EEA #15434

Permitting History

- Certificate on the ENF issued on December 16, 2015.
- Certificate on the Draft EIR issued on September 16, 2016.
- Certificate on the FEIR issued on November 10, 2016
- FAA FONSI/ROD issued on November 14, 2016.
- Section 61 Findings approved on January 19, 2017.

Project Status

The Terminal E Modernization Project will add seven new gates to Terminal E (three of which were already approved under MEPA in 1996 but were never constructed). The existing concourse, terminal core, and terminal roadway frontages (collectively, the "Project") will also be extended. Implementation of the project will better accommodate the current and projected increased demand for international travel that is expected to occur whether or not the project is implemented.

Initial construction on the project began in 2019. To accommodate this initial phase of construction, a replacement Logan Gas Station was constructed in the SWSA along Jeffries Street. In June 2020, the construction program was adjusted in response to the COVID pandemic and resulting passenger and revenue declines. The current plan is to complete and initially open four gates before continuing towards completion of the remaining three gates. An update on a schedule to complete the remaining three gates and covered pedestrian connection the Blue Line Airport Station will be provided in future EDRs/ESPRs; currently, Phase II of the project is deferred.

Figure 9-6 shows the location of the Terminal E Modernization Project. **Table 9-8** lists each of the Section 61 mitigation commitments for the Terminal E Modernization Project and Massport's progress in achieving these measures. To date, Massport has provided three status reports to the FAA (May 2018, April 2019, February 2020 and November 2021). Future EDRs and ESPRs will provide updates, as available.

FIGURE 9-6 Terminal E Modernization Project | **2020/2021 Environmental Data Report**

◆ Terminal E Modernization Project - EEA #15434

0 500 1000 2000 Feet

Table 9-8 Terminal E Modernization Project (EEA #15434)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022)

Mitigation Measure	Status
Overall Project Benefits	
Provide pedestrian access between Terminal E and Massachusetts Bay Transportation Authority (MBTA) Airport Blue Line-Station.	Upon completion of Phase II, a covered pedestrian connection between Terminal E and the MBTA Blue Line Airport Station will be constructed to improve passenger convenience. Various approaches are under consideration and will be further documented in subsequent environmental filings and Environmental Data Reports/Environmental Status and Planning Reports (EDR/ESPRs).
Construct roadway and curb improvements to improve vehicle flow, high occupancy vehicle (HOV) access, and reduce air and GHG emissions.	Construction of Phase I is being advanced consistent with the commitments in the Final Environmental Assessment (EA)/Environmental Impact Report (EIR).
Site Terminal E additions so as to buffer the adjacent neighborhoods from aircraft noise.	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
Seek Leadership in Energy and Environmental Design (LEED®) certification at Silver level or better; meet or exceed Massachusetts (MA) LEED Plus program goals.	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
Provide 400 Hz of power and pre-conditioned air at the new aircraft gates.	400 Hz power and preconditioned air will be installed at the new gates when constructed.
Site Planning and Sustainable Design/Greenhouse Gas Reduction	
Incorporate sustainable design in design, construction, and operations including:	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Improved building envelope*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Improved Air Handling Units;*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Efficient water loops*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Reduced interior lighting power density*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Specify roofing materials with a minimum reflectance rating of 0.70 and emittance value of at least 0.75 for a minimum of 75% of the available roof area. Install non-glare roofing materials.*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Incorporate infrastructure for collection, storage, and handling of recyclable materials.*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.

Table 9-8 Terminal E Modernization Project (EEA #15434)) Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
▪ *Require contractor to develop a construction waste management plan that requires diversion or reduction of construction waste by at least 75%.*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Establish a project-specific goal for sourcing materials extracted, harvested, recovered, and or manufactured within New England.*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Design project to achieve energy efficiencies of a minimum of 20% below the MA Energy Code.*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Include water conservation devices that reduce water use by 20% below code.*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Include a minimum of 25,000 square feet of roof top solar photovoltaic system (approximately 300kW). Heat restroom hot water with solar units.*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR. The Terminal E expansion includes a planned 300,000-kilowatt hour (kWh) rooftop solar array.
▪ *Incorporate occupancy sensors in all indoor areas to reduce electrical demand.*	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
▪ *Evaluate other energy efficiency/greenhouse gas reduction measures as project design progresses.*	Construction of Phase I is being advanced consistent with the decisions on these measures, as recorded in the Final EA/EIR.
Air Quality	
Reduce operational-related carbon dioxide (CO_2) emissions associated with the Project by a minimum of 30% percent.	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
Stormwater Management	
Replace and upgrade stormwater management.	Construction of Phase I is being advanced consistent with the commitments in the Final EA/EIR.
Construction Period Impacts	
In accordance with DEP's Clean Air Construction Initiative, the Authority will require that construction contractors to install emission control devices such as diesel oxidation catalyst and/or particulate filters on certain equipment types (i.e., front-end loaders, backhoes, excavators, cranes, and air compressors).	**Implemented.** These measures are being incorporated during construction.
Retrofitting of certain construction equipment types with emission controls such as diesel oxidation catalyst and/or particulate filters.	**Implemented.** These measures are being incorporated during construction.

Table 9-8 Terminal E Modernization Project (EEA #15434))
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Selection of high efficiency "temporary" space heating /cooling systems.	**Implemented.** These measures are being incorporated during construction.
Remediate subsurface contamination, as necessary, if encountered during tank removals or other excavation activities as part of construction (in compliance with the Massachusetts Contingency Plan).	**Implemented.** These measures are being incorporated during construction.
Soil treatment and reuse on site as part of a Soil Management Plan.	**Implemented.** These measures are being incorporated during construction.
Voluntary compliance with the requirements of City of Boston noise ordinances, including restrictions on the types of equipment that can be used, and limitations on the hours when certain activities can take place (the City of Boston noise ordinance establishes restrictions during the construction hours between 7:00 PM and 7:00 AM).	**Implemented.** These measures are being incorporated during construction.
Construction worker vehicle trip limitation, including requiring contractors to provide off-Airport parking and use of high-occupancy vehicle transportation modes for employees.	**Implemented.** These measures are being incorporated during construction.
Implement Indoor Air Quality (IAQ) Management Plan during construction.	**Implemented.** These measures are being incorporated during construction.
Construction Traffic Operations	
Construction-related traffic will be required to access and egress through the North Gate using only state and federal highways and the Airport roadway network. Construction- related traffic on local East Boston roadways will be prohibited.	**Implemented.** These measures are being incorporated during construction.
Construction Traffic Operations	
Construction employee parking spaces will not be permitted on the construction site nor will provisions be made for them elsewhere on-Airport with the exception of a small number of spaces for supervisory personnel. The Authority will require contractors on this Project to implement construction worker vehicle trip management measures, including requiring off-Airport parking and HOV transportation modes for contractor employees.	**Implemented.** These measures are being incorporated during construction.
Police details will be employed, as needed, to manage traffic and ensure public safety.	**Implemented.** These measures are being incorporated during construction.
Construction Air Quality	
Construction emissions will be reduced and controlled by mandatory contractor implementation of the following best practices:	**Implemented.** These measures are being incorporated during construction.

Table 9-8 Terminal E Modernization Project (EEA #15434))
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Construction Air Quality	
Encouragement for construction-worker site access/egress using dedicated buses and vans;	**Implemented.** These measures are being incorporated during construction.
Reduction of exposed erodible surface areas to the extent feasible;	**Implemented.** These measures are being incorporated during construction.
Covering of exposed surface areas with pavement or vegetation in an expeditious manner and periodic watering;	**Implemented.** These measures are being incorporated during construction.
Minimizing equipment idling times;	**Implemented.** These measures are being incorporated during construction.
Reduction of on-site vehicle speeds;	**Implemented.** These measures are being incorporated during construction.
Ensuring contractor implementation of appropriate fugitive dust and equipment exhaust controls;	**Implemented.** These measures are being incorporated during construction.
Use of low- or zero-emissions equipment to the maximum extent feasible; and	**Implemented.** These measures are being incorporated during construction.
Use of covered haul trucks during materials transportation.	**Implemented.** These measures are being incorporated during construction.
Construction Noise	
Require construction equipment to deploy noise-reduction measures, such as the use of proper mufflers, measures to limit noise from truck traffic. Primarily operate only during daylight hours (7:00 AM to 7:00 PM).	**Implemented.** These measures are being incorporated during construction.

Source: Massport.

Logan Airport Parking Project – EEA #15665

Permitting History

- Certificate on the ENF issued on May 5, 2017.
- Certificate on the Draft EIR issued on August 2, 2019.
- Certificate on the FEIR issued on January 30, 2020

Project Status

The Logan Airport Parking Project includes the construction of 5,000 new commercial parking spaces in structured parking facilities at two on-Airport sites, both of which are currently used for parking. Approximately 2,000 spaces will be sited in a new garage on existing surface parking lots in front of Terminal E and approximately 3,000 spaces will be accommodated at the Economy Garage through an expansion of the existing facility.

The project is consistent with the recently amended Logan Airport Parking Freeze (310 CMR 7.30), which allows for the increase of up to 5,000 on-Airport commercial parking space and will help Massport meet the parking needs of its users. The project will reduce VMT and associated air emissions at Logan Airport by increasing the quantity of available on-Airport parking. The project aims to decrease the number of private vehicles that access the Airport via environmentally undesirable drop-off/pick-up modes, which generate up to four vehicle trips per passenger compared to two vehicle trips for passengers who drive and park.

The project is being phased with the first 2,000 spaces to be constructed in a new garage atop the surface parking lot across from Terminal E (Phase I). Phase II will consist of the additional 3,000 spaces at the Economy Garage.

Both phases of this project remain deferred due to the COVID pandemic. An updated schedule for this project will be included in upcoming EDRs and ESPRs, as available. **Figure 9-7** shows the location of the Logan Airport Parking Project. **Table 9-9** lists each of the Section 61 mitigation commitments for the Logan Airport Parking Project and Massport's progress in achieving these measures.

FIGURE 9-7 Logan Airport Parking Project | **2020/2021 Environmental Data Report**

◆ Logan Airport Parking Project EEA #15665

Phase I Terminal E
Phase II Economy Garage

0 500 1000 2000 Feet

Table 9-9 Logan Airport Parking Project (EEA #15665)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022)

Mitigation Measure	Status
Overall Project Benefits	
Accommodate existing and anticipated air passenger demand for parking to reduce drop-off/pick-up mode share and associated vehicle miles travelled (VMT) and on-Airport and off-Airport air emissions	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds. The new parking spaces will be constructed to reduce drop-off/pick-up mode share and associated vehicle miles traveled and on-Airport and off-Airport air emissions.
Reuse existing developed areas (i.e., the Project sites avoid undeveloped, greenfield lands).	Both project sites (surface parking lot in front of Terminal E and the Economy Garage) are fully developed and currently in use for parking.
Selecting project sites with community input that are in areas already used for parking, are on existing bus/shuttle routes, and are separated from nearby residential communities	Both project sites (surface parking lot in front of Terminal E and the Economy Garage) were selected with community input. They are on existing bus/shuttle routes and are separated from nearby residential communities.
Providing added noise barrier benefits in conjunction with the Terminal E Modernization Project, through the expansion of the existing Economy Garage.	When constructed, the additional levels on the Economy Garage will provide additional community noise buffering from airside noise sources.
Providing dynamic signage/messaging, parking reservation system, and parking guidance via electronic space occupancy detection to reduce on-Airport circulation as well as associated VMT and air emissions.	Final design will include these measures to reduce on-Airport circulation as well as associated VMT and air emissions.
Sustainability and Resiliency	
Incorporating measures from the U.S. Green Building Council's Parksmart rating system into the project's technology, structural design, and operation	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Reducing lighting power densities from a base of 0.19 watts per square foot to a maximum of 0.05 watts per square foot.	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Installing occupancy sensors and photocells on all applicable interior and exterior lighting	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Installing programmable thermostats where applicable (i.e., mechanical/electrical rooms)	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design proceeds.
Designing the parking decks to be open air, negating the need for ventilation systems	All new parking spaces will be open air.
Performing building commissioning in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1-2007	Building commissioning will follow these procedures.

Table 9-9 Logan Airport Parking Project (EEA #15665)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Sustainability and Resiliency	
Incorporating a solar photovoltaic (PV) system at the new garage in front of Terminal E capable of offsetting 50 percent of the facility's total energy consumption	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Relocating the existing solar PV system at the new garage in front of Terminal E capable of offsetting 50 percent of the facility's total energy consumption, including all lighting and power required for its electric vehicle (EV) charging stations	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Reserving parking spaces for alternative fuel vehicles (e.g., EVs) amounting to at least 1 percent of total spaces and assigning preferred parking spaces for other low-emitting and fuel-efficient vehicles amounting to at least another 1 percent of total spaces	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Installing 11 EV charging stations (22 ports) in the new garage in front of Terminal E.	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Designing and building the proposed garages to accommodate expanded EV charging infrastructures to accommodate 150 percent of demand	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Integrating vertical landscaping into the façade of the new garage in front of Terminal E	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Adhering to durable design principles and a preventative maintenance plan to extend facility lifespan and avoid greenhouse gas emissions caused by future large-scale construction and renovation activities	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Installing and applying only no- or low-volatile organic compound (VOC) coatings, paints, and sealants	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Installing halon-free fire suppression systems in each garage	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.

Table 9-9 Logan Airport Parking Project (EEA #15665)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Sustainability and Resiliency	
Complying with Massport's Floodproofing Design Guide and elevating critical equipment and systems above the designated design flood elevations	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Implementing an active recycling program to reduce the amount of waste sent to regional landfills/incinerators and to reduce greenhouse gas emissions associated with material disposal	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Displaying educational materials to convey the facilities' environmentally sustainable design and operations	The Logan Airport Parking Project is currently deferred. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.
Construction Period Mitigation	
Providing on-Airport storage areas for construction materials	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Coordinating the arrival of large construction equipment among various on-Airport projects and limiting their arrival or removal during peak travel hours (both Airport and commuter peaks)	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Developing specific truck routing and/or staging plans for implementation by the various contractors	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Requiring construction managers to prepare: - *Draft Soil Management Plan* - *Draft Stormwater Pollution Prevention Plan* - *Draft Management Plan for Dewatering, if needed* - *Draft Health and Safety Plan*	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Employing a Construction Waste Management Plan that requires at least 85 percent of materials to be recycled or reused	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Controlling rodents through routine inspection, monitoring, and treatment	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Prioritizing the use of construction equipment and materials that are repurposed, reused, or recycled (or contain recycled content), where feasible	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.

Table 9-9 Logan Airport Parking Project (EEA #15665)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Construction Period Mitigation	
Prioritizing construction equipment and materials that are sourced regionally (i.e., within 300 miles of the Project sites) to reduce greenhouse gas emissions associated with their transport	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Using regional (i.e., within 75 miles) labor to the greatest extent practicable	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Encouraging construction companies to provide off-Airport parking for their employees and to provide shuttle services from these locations (shuttles are required to use the Coughlin Bypass road to access the Airport)	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Requiring all construction vehicle/equipment to follow anti-idling procedures and all construction managers to provide associated training	These measures will be implemented during project construction.
Requiring the use of low- or zero-emissions equipment, where practicable	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Requiring the retrofitting of appropriate diesel construction equipment with diesel oxidation catalyst and/or particulate filters	These measures will be implemented during project construction.
Requiring contractors to use Ultra Low Sulfur Diesel Fuel (ULSD)	These measures will be implemented during project construction.
Maintaining low on-site vehicle speeds	These measures will be implemented during project construction.
Deploying air quality and fugitive dust management best practices, such as reducing exposed erodible surface areas through appropriate materials and equipment staging, covering exposed surface areas with pavement or vegetation in an expeditious manner, and stabilizing soil with cover or periodic watering	These measures will be implemented during project construction.
Using and maintaining construction equipment appropriately to avoid unnecessary noise and applying noise-reduction measures to reduce noise from pile driving by at least 5 A-weighted decibels (dBA) below their unmitigated levels 1	These measures will be implemented during project construction.

Table 9-9 Logan Airport Parking Project (EEA #15665)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Construction Period Mitigation	
Requiring trucks to access the Project sites by Route 1A, Interstate 90, Coughlin Bypass road, and the main Airport roadway only or other routes in compliance with transportation safety requirements	These measures will be implemented during project construction.
Prohibiting trucks from using local streets	These measures will be implemented during project construction.
Specifying truck routes in contractors' construction specifications	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Using concrete production and batching plants with access via Route 1A or Interstate 90	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Encouraging construction workers to use Massachusetts Bay Transportation Authority (MBTA) transit services, Logan Express, the water shuttle, and other high-occupancy modes of travel	These measures will be implemented during project construction.
Putting into place an Erosion and Sedimentation Control Program, in compliance with the Stormwater Pollution Prevention Plan, to protect water quality and to minimize construction phase impacts to Boston Harbor	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Deploying spill prevention measures and sedimentation controls throughout the construction phases to prevent pollution from construction equipment and erosion	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.
Using the following erosion and sedimentation controls throughout the construction phases: - *Perimeter barriers such as straw wattles or compost-filled "silt sock" barriers will be placed around upland work areas to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site* - *Existing catch basins within the work sites will be protected with barriers (where appropriate) or silt sacks* - *Open soil surfaces will be stabilized within 14 days after grading or construction activities have temporarily or permanently ceased*	These measures will be included in the Phase I construction specifications. Additional details on Phase II construction will be outlined when that proceeds.

Table 9-9 Logan Airport Parking Project (EEA #15665)
Details of Ongoing Section 61 Mitigation Measures (as of September 30, 2022) (Continued)

Mitigation Measure	Status
Ground Access Improvement, Trip Reduction, and Emissions Reduction	
Implement the following ground access improvement, trip reduction, and emission reduction initiatives: - *Advance the electrification of ground service equipment, pursuant to which all ground service equipment will be replaced no later than the end of 2027 (as available)* - *Expand Logan Express capacity by 10 percent* *Increase the percentage of zero emission taxi, livery, and Ride App vehicles (i.e., those associated with companies such as Uber and Lyft) by providing: high-speed electric vehicle charging stations at all taxi, livery, and Ride App pools; and taxi and Ride App queue priority to electric vehicles (subject to negotiation with companies)*	Work on these initiatives moved forward in 2019. The Logan Airport Parking Project is currently deferred due to the COVID pandemic. Design is currently on hold and mitigation measures will follow when design and implementation proceeds.

Source: Massport.

This Page Intentionally Left Blank.

MEPA Appendices

- Appendix A, MEPA Certificates and Responses to Comments
- Appendix B, Comment Letters and Responses
- Appendix C, Proposed Scope for the *2022 ESPR*
- Appendix D, Distribution

This Page Intentionally Left Blank.

A

MEPA Certificates and Responses to Comments

- Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the *Logan Airport 2018/2019 Environmental Data Report (EDR)* and Massport's Responses to Comments raised in the Certificate.
- Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the *Logan Airport 2017 Environmental Status and Planning Report (ESPR)*.
- Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the *Logan Airport 2016 EDR Notice of Project Change*.
- Copies of the Secretary of the Executive Office of Energy and Environmental Affairs Certificates issued for the reporting years 2016, 2015, 2014, 2012/2013, and 2011.
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Terminal E Modernization Project Environmental Notification Form.
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Terminal E Modernization Project Draft Environmental Assessment/Environmental Impact Report.
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Terminal E Modernization Project Final Environmental Assessment/Environmental Impact Report.
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Logan Airport Parking Project Environmental Notification Form.
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Logan Airport Parking Project Draft Environmental Impact Report.
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Logan Airport Parking Project Final Environmental Impact Report.

This Page Intentionally Left Blank.

Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the Logan Airport *2018/2019 Environmental Data Report (EDR)* and Massport's Responses to Comments raised in the Certificate

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Kathleen A. Theoharides
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/eea

March 19, 2021

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
2018/2019 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2018/2019 Environmental Data Report (EDR)
PROJECT MUNICIPALITY	: Boston/Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: January 6, 2021

As Secretary of the Executive Office of Energy and Environmental Affairs (EEA), I hereby determine that the Environmental Data Report (EDR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA) (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

The environmental review process for Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of the Massachusetts Port Authority's (Massport) long-range planning process. The ESPR provides a "big picture" analysis of the environmental impacts associated with current and projected activity levels, and presents a comprehensive strategy to avoid and minimize impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific Environmental Impact Reports (EIRs). The ESPR is generally updated on a five-year basis. The previous ESPR for the year 2017 (2017 ESPR) was filed in August of 2019. The Certificate on the 2017 ESPR was issued on November 25, 2019 and included a Scope for this 2018/2019 Environmental Data Report (EDR).

EDRs are filed in the years between ESPRs. The EDR is a retrospective document that is filed annually and identifies environmental impacts based on actual passenger activity and operations. This 2018/2019 EDR follows the 2017 ESPR. In the 2017 ESPR, Massport requested to combine both the 2018 EDR and the 2019 EDR into one document referred to as the 2018/2019 EDR. The 2018/2019 EDR is the subject of this review. This Certificate also contains a Scope for the next EDR.

The 2018/2019 EDR indicates that the strong economy resulted in a rapid increase in passenger activity levels and aircraft operations during 2018-2019. In 2019, air passenger activity levels at Logan Airport reached an all-time high of 42.5 million, an increase of 3.9 percent over 2018 (40.9 million). If this trend continues, the Airport will likely exceed the 50 million annual passengers much sooner than the 10 to 15 year timeframe projected in the 2017 ESPR. To provide additional context, the 2018/2019 EDR also includes an update through fall 2020 to acknowledge the decrease in passenger activity and passenger operations that occurred in 2020 as a result of the COVID-19 pandemic. Specifically, the 2018/2019 EDR details how beginning in March 2020, flights in and out of Logan Airport were dramatically reduced and passenger levels dropped by over 90 percent at the peak of the COVID-19 pandemic in the spring and summer of 2020. While activity levels began a slow recovery in mid-summer 2020, the ongoing wave of COVID-19 cases has resulted in a decrease in total flight operations by approximately 50 percent and passenger levels by approximately 70 percent compared to January through October 2019. The 2018/2019 EDR predicts that it will be years before operations at the Airport return to pre-COVID-19 levels. While I understand that future growth at Logan Airport will be impacted by public health guidance and post-pandemic economic recovery, comments from the Conservation Law Foundation (CLF), Airport Impact Relief Incorporated (AIR Inc.), the Town of Milton, and others request that Massport refine its process for forecasting growth rates and provide additional data to support the estimates. While activities and operations have decreased due to the COVID-19 pandemic, the next EDR should describe the methodology for the forthcoming future forecast which should be provided in the 2022 ESPR. Additionally, I am requiring that Massport file a combined 2020/2021 EDR given that 2020 activity levels, if considered in isolation, would not provide a clear and complete indication of post-pandemic growth trends. I expect that Massport will continue their ongoing consultation and share data regarding observed trends with the Massport Community Advisory Committee (CAC) and other stakeholder groups as these documents are being developed.

A-1

A-2

A-3

Although not required as part of the Scope, the 2018/2019 EDR also provides updates through fall 2020 where the current conditions have resulted in changes to planned capital projects or programs that were in place in 2018 and 2019 or were planned to occur in the near future. As described in the 2018/2019 EDR, these changes are a result of changes to capital and operations plans that have occurred in recognition of the dramatic reduction in flights, passenger levels, and revenue caused by the ongoing COVID-19 pandemic. The changes primarily include the deferral of several planned capital projects that would provide environmental benefits and reduce impacts associated with airport operations as activity levels recover, including but not limited to: the Logan Airport Parking Project (EEA# 15665) (5,000 new parking spaces, solar photovoltaic system, and electric vehicle charging stations), Phase 2 of Terminal E Modernization (EEA# 15434) (3 new terminal gates), several high-occupancy-vehicle investments (addition of 1,000 new spaces to Framingham Logan Express Garage (EEA# 16168), opening a new Logan Express suburban location, and implementing a 2nd urban Logan Express Service at North Station. I note comments from CLF, AIR Inc., the Massachusetts Chapter of the Sierra Club, and Mr. Frederick Salvucci identify concerns that the 2018/2019 EDR does not present a decision making process or timeline regarding future implementation of the deferred capital projects. As noted

below, I expect that the 2020/2021 EDR will include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. The EDR should also include a description of the economic, financial, or other factors that will inform this decision. As noted above, I encourage Massport to continue their ongoing consultation with the Massport CAC and other stakeholder groups as this process is developed. A-4

Comments also request that Massport present more direct information about the major research findings around health and airport impacts, including likely pollution and noise health impacts, and identify mitigation commitments to reduce these impacts. In addition to responding to these comments, the 2020/2021 EDR should report on the progress and other refinements for tracking noise, traffic, and air emissions and abatement efforts, as further described in the Scope below. While Massport has followed through on several important commitments despite these uncertain conditions, providing environmental mitigation commensurate with impacts remains critical as the economy recovers and demand for air travel increases. The 2020/2021 EDR should document potential impacts and trends and propose measures to avoid, minimize and mitigate environmental impacts. While I acknowledge that the next EDR will depict a decrease in passenger growth and aircraft operations due to the COVID-19 pandemic; I expect that future EDRs will include additional information if actual growth in passenger and/or aircraft operations outpace the forecasts, including a discussion of passenger and activity levels and planning/mitigation to address impacts of the growth. Furthermore, I continue to reserve the right to require that future ESPRs evaluate the impacts of a range of activity forecasts, based on the results of the interim reporting provided in the EDRs. A-5 A-6

Logan Airport Environmental Review and Planning

The 2018/2019 EDR is generally responsive to the Scope. It contains useful data on activity levels and impacts, and lays out a forecast for trends in the future years. The technical studies in the 2018/2019 EDR include reporting and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking.

As noted above, the 2017 ESPR presented an updated forecast for Logan Airport aircraft operations and passenger activity. That forecast focused on a Future Planning Horizon including projections of 50 million annual air passengers and 486,000 annual aircraft operations. As presented in the 2018/2019 EDR, the strong economy caused a rapid increase in passenger activity levels and aircraft operations during 2018-2019. Through 2019, Logan Airport was one of the fastest growing large airports in the United States in terms of passenger volume. From 2017 to 2019, U.S. air passenger traffic grew by 9.1 percent, whereas Logan Airport experienced a passenger growth of 10.7 percent over the same time period.

In 2019, air passenger activity levels at Logan Airport reached an all-time high of 42.5 million, an increase of 3.9 percent over 2018 (40.9 million). As has been the recent trend prior to March 2020, aircraft operations increased at a slower rate than passengers. In 2019, aircraft operations totaled 427,176 and in 2018, aircraft operations totaled 424,024. These levels both represent increases compared to the 2017 passenger levels of 38.4 million and 401,371 operations. The 2018/2019 EDR

asserts that the growth observed during 2018 and 2019 was directly correlated to the strong national and regional economies. However, even with this strong growth, aircraft operations remained well below the 487,996 operations in 2000 and the historic peak of 507,449 operations reached in 1998. The 2018/2019 EDR concludes that the slower growth in aircraft operations compared to passenger levels remains due to the steady increase in aircraft size and improving aircraft load factors (passengers/available seats). As noted above, the 2018/2019 EDR also describes how the COVID-19 pandemic has significantly reduced airport operations and passenger growth in 2020 and predicts that it will be years before operations at the Airport return to pre-COVID-19 levels.

This 2018/2019 EDR focuses on: (1) rapidly growing domestic and international passenger demand; (2) the increase in use of transportation network companies (TNC), such as Uber and Lyft, to Logan Airport and subsequent effects; (3) airport-wide emissions including those associated with vehicle trips; (4) use of the Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) for noise and air quality modeling; and, (5) noise abatement strategies.

Massport began collecting TNC data in 2017 when TNCs were authorized to pick up customers from the airport. The 2018/2019 EDR provides data and identifies effects of TNCs on traffic flow and congestion, and provides an assessment of ground access trends. Massport committed to a goal of 35.5 percent high occupancy vehicle (HOV) mode share goal by 2022 and 40 percent by 2027. Based on the results of the 2019 Air Passenger Ground-Access Survey, HOV mode share has reached 40.4 percent, exceeding both near-term and longer-term goals. The 2018/2019 EDR provides updates on the FAA requirements for changes to area navigation (RNAV) procedures introduced in the 2017 ESPR. The RNAV program has been implemented throughout the country and its primary purpose is to increase safety and operational efficiency. As noted in prior MEPA review documents, the implementation of several of these procedures has resulted in concentrations of flight patterns over certain communities and significant increases in noise exposure. The impact of the RNAV program is emphasized in comment letters received on the 2018/2019 EDR and the 2017 ESPR. Massport and the FAA signed a Memorandum of Understanding (MOU) in 2017 to frame a new process for analyzing opportunities to incrementally reduce noise through changes or amendments to Performance Based Navigation (PBN), including RNAV procedures. The 2018/2019 EDR provides an update on this process and describes Massport's efforts to mitigate noise exposure and impacts. Massport continues to seek funding for noise mitigation for properties that are eligible for participation in its Residential Sound Insulation Program (RSIP). In 2019, Massport updated its RSIP Noise Exposure Map contours and submitted an AEDT-derived noise exposure map to the FAA in 2020 for review and discussion.

The 2018/2019 EDR provides information on noise conditions modeled using the latest FAA noise modeling software, the AEDT. Massport transitioned to AEDT from the Integrated Noise Model (INM) in its 2016 EDR. The 2018/2019 EDR also uses FAA's AEDT model for emission factors compared to the legacy Emissions and Dispersion Modeling System (EDMS) model. Massport attributes some of the changes in air emissions to the use of the AEDT model, which assumes higher nitrogen oxides emission factors compared to the legacy EDMS model.

Review of the 2018/2019 EDR and Scope for the 2020/2021 EDR

The 2018/2019 EDR identifies the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts; analyzes trends and environmental impacts of

operations in calendar year 2018 and 2019; and provides updates on projects, environmental management plans, and the status of project mitigation. As noted above, Massport has also included updates through fall 2020 in the 2018/2019 EDR where the current conditions have resulted in changes in projects or programs that were in place in 2018 and 2019. As noted above, I am requiring that Massport file a combined 2020/2021 EDR to provide a clear and complete indication of post-pandemic growth trends.

The 2020/2021 EDR must include information on the environmental policies and planning that form the context of environmental reporting, technical studies, and environmental mitigation initiatives against which projects at Logan Airport can be evaluated. This should include identification of the cumulative effects of Logan Airport operations and activities. The results of the Logan Airport Air Passenger Ground Access Survey and the Long-term Parking Management Plan should inform transportation planning and strategies to achieve the HOV mode share goal. A-7 A-8

The 2020/2021 EDR must include copies of all ESPR and EDR Certificates and a distribution list (indicating those receiving documents, CDs, or Notices of Availability). Supporting technical appendices should be provided as necessary. A-9

Response to Comments

The Response to Comments section should address all of the substantive comments on the 2018/2019 EDR, and other Certificates for Logan Airport that reference EDR/ESPR documentation (e.g. Logan Airport Parking Project (EEA# 15665), Terminal E Modernization (EEA# 15434)). To ensure that the issues raised by commenters are addressed, the 2020/2021 EDR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the EDR beyond what has been expressly identified in this Certificate. The Response to Comments should not reference a section of the EDR unless they are directly responsive to the comment. Common themes that should be addressed throughout the EDR and in the Responses to Comments include noise (modeling of noise contours and noise abatement) and emissions reduction issues. The EDR should also include sufficient information to address comments on air quality and public health which are common concerns of commenters. A-10 A-11

Activity Levels

Air traffic activity levels at Logan Airport are the basis for the evaluation of noise, air quality, and ground access conditions associated with the Airport. In this section, current activity levels at the Airport are compared to prior-year levels, and historical passenger and operations trends at Logan Airport dating back to 2000, which is the year Massport approved an Environmental Management Policy.

In 2017, air passenger activity levels at Logan Airport reached 38.4 million, an increase of 5.9 percent from 2016. At the time of the 2017 ESPR filing, it was projected that Logan Airport would reach 50 million annual passengers in the next 10 to 15 years (the Future Planning Horizon). Air passenger activity levels at Logan Airport in 2018 and 2019 increased to 40.9 million in 2018 and 42.5 million in 2019. The 2019 passenger activity level represented a high for Logan Airport, which had been averaging an annual passenger growth of 5.9 percent since 2013 and continued to outpace the overall U.S.

passenger growth of 4.1 percent per year for the same time period. The 2018/2019 EDR indicates that the analysis provided for Massport's forecast is consistent with the FAA's Terminal Area Forecast (TAF).

As indicated in the 2017 ESPR, Massport needs to ensure mitigation is being provided commensurate with increased growth and associated impacts. The projection of 50 million annual air passengers in the next 10 to 15 years represents an average annual growth rate of 1.5 percent. As noted above, the 2018 and 2019 growth rates exceed the 1.5 annual growth rate and data for 2020 would likely have exceed the projections, absent the decrease associated with COVID-19 pandemic. As previously stated in the 2017 ESPR, I expect that future EDRs will include additional information if actual growth in passenger and/or aircraft operations outpace the forecasts. Specifically, the EDR(s) should explain the circumstances that caused the growth, describe how this may affect the impact forecasts, and identify mitigation and policy strategies that will be implemented to address the proportional growth in impacts. In addition, as noted above, the future EDRs should include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. The EDR should also include a description of the economic, financial, or other factors that will inform this decision. I continue to reserve the right to require that future ESPRs evaluate a range of activity forecasts based on the results of this interim reporting. I also expect that air and noise emissions related to passenger and activity levels and planning/mitigation will be a significant emphasis of the 2020/2021 EDR.

A-12

A-13

A-14

A-15

A-16

Domestic air passengers represent Logan Airport's largest market segment, accounting for approximately 81.2 and 80.2 percent of total air passengers in 2018 and 2019, respectively. The domestic passenger market increased by 6.9 percent in 2018 compared to 2017, and by 2.6 percent from 2018 to 2019. According to the 2018/2019 EDR, the continued economic and personal income growth of the New England region and the increased need for business travel contributed to the increase in domestic passenger demand over 2018 and 2019.

International passenger traffic at Logan Airport increased by 5.3 percent in 2018 over 2017 and 9.7 percent over 2018 levels. In 2018 and 2019, international passengers comprised approximately 18.5 and 19.6 percent of total Airport passengers, respectively. Since 2013, the international air passenger segment has averaged a 10.6-percent annual growth. According to the 2018/2019 EDR, this increase was driven by strong market demand as well as a rapid increase in foreign carrier services in recent years. As a large hub airport along the U.S. eastern seaboard, Logan Airport also ranked sixth in terms of transatlantic international passengers with nearly 5.0 million passengers flying to Europe, the Middle East, and Africa in 2019, increasing by 10.3 percent compared to 2018.

Aircraft operations continued the long-term trend of increasing at a slower rate than passenger growth. In 2018, operations totaled 424,024 and 2019 operations totaled 427,176. That growth was directly correlated to the strong national and regional economy. Even with the strong growth, aircraft operations remained well below the 487,996 operations in 2000 and the historic peak of 507,449 that aircraft operations reached in 1998. The combination of fewer operations in cleaner and quieter aircraft has resulted in dramatically reduced environmental impacts when compared with those historical peaks.

The increasing number of passengers per flight reflects a shift away from smaller aircraft and

rising load factors as airlines continue to focus on capacity control and improvements in efficiency. This trend is indicative of the industry-wide shift toward higher aircraft load factors and an increase in the number of domestic and international destinations. In 2019, Logan Airport operations accommodated an average of 99.5 passengers per flight compared to 96.6 in 2018 and 95.7 in 2017, which is the highest average in the last decade. The 2018/2019 EDR attributes this increase in 2018 and 2019 to the introduction of newer and larger aircraft like the Airbus 350 and Boeing 787 at Logan Airport, especially for international long-haul flights to both existing and new destinations. The average number of passengers per flight has risen by 27.9 percent since 2010 when the average number of passengers per flight was 77.8. In 2019, Logan Airport's average domestic load factor was 85.1 percent, an increase from 2018 levels of 84.2 percent and 2017 levels of 82.6 percent. The national average domestic load factor also increased during the same period, from 81.8 percent in 2017 to 84.4 percent in 2018 and 85.1 percent in 2019.

The 2018/2019 EDR provides an update on measures that have been implemented to improve accessibility to the Airport and a relieve on-Airport roadway congestion. In 2018 and 2019, Massport's strategies to improve and expand HOV service to and from Logan Airport included continued investment in Logan Express facilities and service. These improvements were in support of Massport's goal to double Logan Express shuttle bus ridership from 2 million to 4 million passengers (by the time Logan Airport reaches 50 million passengers), to reduce passenger and employee VMT, congestion, and associated air quality emissions. Those initiatives included both the urban and suburban Logan Express sites, and focused on increasing frequencies, adding parking, improving customer amenities, and reducing fares. Massport also continued to evaluate opportunities to add an additional urban and suburban location. As a complement to the existing Logan/Back Bay service, in 2019 Massport purchased new buses in anticipation of opening a new urban location proximate to Boston's North Station in 2020. The 2018/2019 EDR indicates this effort has been deferred due to decreased demand caused by the pandemic.

The 2018/2019 EDR also describes the parking management strategy that addresses parking supply, pricing, and operations to promote the use of HOV, transit, and shared-ride options, and to reduce the environmental impacts associated with drop-off/pick-up modes. As described in prior MEPA filings, the Logan Airport Parking Project (EEA #15665) is one element of Massport's ground access strategy to reduce drop-off/pick-up modes. The parking project will provide an additional 5,000 commercial parking spaces at Logan Airport. Massport has been advancing plans for constructing 2,000 of the spaces in a new garage in front of Terminal E. The 2018/2019 EDR describes that the construction of these additional parking spaces is now deferred due to the reduction in passenger activity associated with the ongoing COVID-19 pandemic. Massport has also deferred the remaining 3,000 spaces, which are being planned as a future expansion of the Economy Garage.

The 2020/2021 EDR should report on the effectiveness of the TNC management plan and provide an update on planned and executed measures to relieve on-Airport roadway congestion including updates on the Logan Airport Parking Project. As noted above, several measures to improve the use of HOV and reduce VMT have been deferred, including the expansion of the Framingham Logan Express Garage (EEA# 16168), opening a new Logan Express suburban location, and implementing a second urban Logan Express Service at North Station. The 2020/2021 EDR should include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided

A-17

A-18

commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. To the extent feasible, the EDR should identify the metrics, monitoring data, or other criteria that will be used to inform when these measures will be implemented based on future increases in demand for air travel as the economy recovers.

A-18

The 2020/2021 EDR should also report on:

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Domestic and international passenger activity levels;
- Cargo and mail volumes;
- Comparison of 2020 operations and passenger activity levels to 2018/2019 activity levels; and
- National aviation trends compared to Logan Airport trends.

A-19

Sustainability at Logan Airport

The 2018/2019 EDR describes Massport's airport wide sustainability goals as identified in its International Organization for Standardization (ISO) 14001 Environmental Management System (EMS) and Sustainability Management Plan (SMP). The Logan Airport SMP (2015) is integrated with the existing EMS framework to promote environmental, social, and economic improvement. The SMP identifies efforts to promote, coordinate, and integrate sustainability initiatives Airport-wide. Progress towards achieving these goals is addressed in the 2018/2019 EDR. Some highlights of initiatives that were completed in 2018 and 2019 include: conducting a comprehensive waste assessment of Logan Airport which categorized more than 5.5 tons of material; development of Massport's Resiliency Web Tool; completion of the Logan Airport Stormwater and Flood Risk Modeling Study; updating the Logan Flood Operations Plan and Heavy Weather and Flood Operations Plan; and, relocation of Ride App pick up and drop off locations to central garage to help reduce traffic congestion. The Logan Airport Annual Sustainability Report, first published in April 2016, provides a progress summary of sustainability efforts at Logan Airport based on Massport's sustainability goals and targets established in the Logan Airport SMP. It highlights Massport's progress towards improving sustainability and enhancing resiliency at its facilities.

Massport is currently working on a vision for Massport's "Sustainability 2.0" as a next-level planning effort to implement principles and approaches from the SMP at other Massport facilities and to update Massport's sustainability goals and targets. Massport is currently advancing a series of short-term initiatives to help reach its goals in the areas of (1) energy and GHG emissions; (2) water conservation; (3) community, employee, and passenger well-being; (4) materials, waste management, and recycling; (5) resiliency; (6) noise abatement; (7) air quality improvement; (8) ground access and connectivity; (9) water quality/stormwater; and (10) natural resources. In early 2019, Massport conducted a series of charrettes with Massport staff, tenants, and business partners to help define this vision. Massport is currently working on a detailed set of recommendations for Sustainability 2.0. Updates will be reported in future Massport Annual Sustainability and Resiliency Reports and included in future EDRs.

The 2018/2019 EDR describes how a number of sustainability and resiliency projects at the airport have been deferred due to the COVID-19 pandemic such as installing a solar PV system at the

new garage in front of Terminal E in 2020. In addition, Massport has installed electric vehicle (EV) charging facilities in all its garages and plans to install them in the proposed new garage in front of Terminal E and the expanded Economy Garage when these projects are constructed. However, both projects are currently deferred. The 2020/2021 EDR should provide updates to airport wide sustainability goals. As noted above, the 2020/2021 EDR should include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. To the extent feasible, the EDR should identify the metrics, monitoring data, or other criteria that will be used to inform when these measures will be implemented based on future increases in demand for air travel as the economy recovers.

A-20

Climate Change

Massport assets and Logan Airport, in particular, are critical infrastructure and play an important role in the economy. As recognized in Executive Order (EO) 569 "Establishing an Integrated Climate Change Strategy for the Commonwealth" and a suite of other state and municipal initiatives, the impacts of climate change must be an important consideration for development across the state. Climate change presents a serious threat to the environment and the Commonwealth's residents, communities, and economy. The EO indicates that extreme weather events associated with climate change present a serious threat to public safety and the lives and property of our residences.

The EO also identifies the transportation sector as a significant contributor to GHG emissions in the Commonwealth and the only sector in which GHG emissions are increasing. In 2017, EEA and the Massachusetts Department of Transportation (MassDOT) conducted a number of transportation listening sessions throughout the Commonwealth to inform development of strategies and programs to reverse the growth in this sector. The 2018/2019 EDR addresses Massport's consistency with EO 569, the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, and the Massachusetts Energy Plan.

GHG emissions

The 2018/2019 EDR incorporates GHG emissions reporting consistent with that provided in the 2017 ESPR which was normalized to support effective review and analysis. The 2018/2019 EDR includes only conditioned (heated and cooled, enclosed buildings) building areas in energy use and emission intensity calculations, reports input energy components (oil, gas, electricity) and central plant data, and clarifies how renewable energy technologies are accounted for in the analysis. The 2018/2019 EDR contains a GHG emissions inventory for Logan Airport which presented emissions and energy data normalized by passenger use and building area. The GHG emissions associated with buildings and vehicles were presented as pounds of carbon dioxide (CO_2) per passenger.

The GHG emissions for aircraft, ground support equipment (GSE), motor vehicles, and stationary sources were quantified using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (Airport Cooperative Research Program

(ACRP) Report 11, Project 02-06). The 2018/2019 EDR compares the results of the 2018 and 2019 GHG emissions inventory to the 2017 ESPR results. The analysis showed total Logan Airport GHG emissions increased from 2017 to 2018 by approximately 10 percent and from 2018 to 2019 by approximately 4 percent. These increases are primarily due to the increase in aircraft operations (i.e., 5.6 percent in 2018 and 0.7 percent in 2019). According to the 2018/2019 EDR, the GHG emissions associated with Logan Airport in 2018 and 2019 are approximately 1 percent of the most recent statewide emissions estimates.

The 2020/2021 EDR should incorporate GHG emissions reporting consistent with that provided in the 2018/2019 EDR which was normalized to support effective review and analysis. In addition, Massport should ensure that only conditioned (heated and cooled, enclosed buildings) building areas are included in energy use and emission intensity calculations, report input energy components (oil, gas, electricity) and central plant data, and clarify how renewable energy is accounted for in the analysis. I encourage Massport to consider the recommendations identified in comments from the Department of Energy Resources (DOER) which recommend electrification of space and water heating as well as evaluation of opportunities for distributed renewable energy generation. Massport should consult with the MEPA Office and the DOER regarding presentation of GHG data in the 2020/2021 EDR. A-21 A-22

In the 2020/2021 EDR, GHG emissions should continue to be quantified for aircraft, GSE, motor vehicles, and stationary sources using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* as developed for the 2018/2019 EDR. The results of the 2020 GHG emissions inventory should be compared to the 2018 and 2019 results. A-23

Adaptation and Resiliency

The 2018/2019 EDR describes the resiliency program developed by Massport to identify critical infrastructure and to enhance its resiliency. As reported in the Logan Airport 2018 Annual Sustainability and Resiliency Report approximately 60 percent of critical assets (electrical power, diesel fuel pumping stations, telecommunications systems, and public safety) have been protected from storm surge flooding via relocation, and/or raising in elevation. This exceeds the 2020 resiliency target of elevating at least 25 percent of critical assets. A particular concern for Massport is the effect of sea level rise and projected increases in the severity and frequency of storms. To address this concern, Massport has initiated a Disaster and Infrastructure Resiliency Planning (DIRP) Study for Logan Airport which includes a hazard analysis, modeling of sea-level rise and storm surge, and projections of temperature, precipitation, and anticipated increases in extreme weather events. The DIRP Study provides recommendations regarding short-term strategies to make Massport's facilities more resilient to the effects of climate change. The 2018/2019 EDR provides a summary of the DIRP Study and identifies projects that were completed in 2018 and 2019 (specifically, the flood resiliency projects described below), and identifies which recommendations Massport will implement in the short term and long term. The 2020/2021 EDR should continue to identify which recommendations will be implemented by Massport to improve resiliency. A-24

As part of the DIRP Study Massport created a Floodproofing Design Guide was published in November 2014 and updated in November 2018. Operational aspects of resiliency strategy include the development of Flood Operations Plans for Logan Airport. This plan were introduced in 2014 and

included the planned deployment of temporary flood barriers to protect up to 12 locations of critical infrastructure in the event of severe weather. Additional locations have been permanently enhanced to prevent flooding. The flood operations plans were re-evaluated in 2018 to enhance their effectiveness and to adapt to evolving requirements and past experiences. The 2020/2021 EDR should identify which recommendations will be implemented by Massport to improve resiliency.

The effects of climate change, such as extreme heat, may exacerbate the negative health effects of air pollution. As the effects of climate change progress, I encourage Massport to consider its ability to reduce negative air quality effects as a matter of public health, and to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. As discussed below, the 2020/2021 EDR should report on findings regarding health and airport impacts in relation to emissions, as well as measures to reduce these impacts. A-25

Mitigation

The 2018/2019 EDR provides an update on Massport's mitigation commitments under the MEPA for projects at Logan Airport for which an EIR was filed to document that all feasible measures have been taken to avoid or minimize impacts. The 2018/2019 EDR addresses cumulative, Airport-wide impacts. It also updates the status of mitigation commitments for recent projects such as the Terminal E Modernization Project and the Logan Airport Parking Project as well as projects previously included in the EDRs.

The 2020/2021 EDR should continue to report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review. It should update the status of Massport's mitigation commitments and also identify projects for which mitigation is complete. A-26

Planning

The Airport Planning section describes the status of projects underway or completed at Logan Airport since the filing of the 2017 ESPR which provided updates of work through 2019. Specific topics include terminal area projects, service area projects, buffer/open space projects, Airport parking projects, airside area projects, HOV improvements, and Airport-wide projects.

During 2018 and 2019 there was a strong focus on ground access and trip reduction measures, and terminal improvements. Recent and ongoing terminal area projects are providing seamless post-security connectivity and flexibility among the terminals along with enhancements to passenger processing through consolidated security checking areas. To enhance the on-Airport roadway network, Massport is improving several of the terminal area roadway segments and intersections. In October 2019, Massport opened its new TNC consolidated drop-off and pick-up areas in the Central Garage. In 2018 and 2019, Massport also advanced several HOV services and Logan Express facilities improvements as part of its trip-reduction goals. The 2018/2019 EDR outlines several planning projects that were deferred due to the COVID-19 pandemic.

Project updates include:

- The Logan Airport Parking Project, which will add 5,000 commercial parking spaces at Logan Airport in locations already in use for parking. The additional parking spaces respond to the MassDOT and U.S. Environmental Protection Agency (EPA)'s approval of a modification to the regulatory Logan Airport Parking Freeze. The additional spaces are intended to reduce dropoff/pick-up modes. The joint MEPA and federal review process was completed in January 2020. As noted earlier, this project is currently deferred due to the reduction in passenger activity associated with the COVID-19 pandemic.

- Terminal C Canopy, Connector and Roadway Project received federal environmental approval under NEPA in November 2018. As described in the 2017 ESPR, construction of this project will replace and reconfigure sections of the elevated roadways connecting Terminals B and C. At this time, construction of the replacement canopy is anticipated to begin and be completed in 2021, with a slightly reduced program than originally planned. The Terminal B to C Connector is anticipated to be complete in spring 2022 and roadways are anticipated to be complete in 2023.

The 2020/2021 EDR should continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport must accommodate and guide tenant development. The EDR should describe the status of planning initiatives for the following areas:

- Roadways and Airport Parking;
- Terminal Area;
- Airside Area;
- Service and Cargo Areas;
- Airport Buffers and Landscaping; and,
- Energy, Sustainability, and Resiliency.

A-27

The 2020/2021 EDR should also indicate the status of long-range planning activities, including the status of public works projects implemented by other agencies within the boundaries of Logan Airport. The 2020/2021 EDR should provide an update on Logan Airport Parking project, including a description of the decision making process and factors that will be used to inform the timing of its implementation. To the extent feasible, the EDR should identify the metrics, monitoring data, or other criteria that will be used to inform when it will be implemented based on future increases in demand for air travel as the economy recovers. The 2020/2021 EDR should identify the status and assess the effectiveness of ground access changes, including roadway and parking projects, that consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on streets in adjacent neighborhoods.

A-28

A-29

A-30

Regional Transportation

The 2018/2019 EDR describes activity levels at New England's regional airports and provides an update on regional planning activities, including long-range transportation efforts. The New England region is anchored by Logan Airport and a system of 10 other commercial service, reliever, and general aviation (GA) airports (regional airports). In 2018 and 2019, the New England region saw an increase in air passenger activity. Regional air passengers increased by 6.5 percent to 58.3 million air passengers in 2018 and by 2.5 percent in 2019 (59.7 million). The 10 regional airports in New England

accommodated 17.3 and 17.2 million air passengers in 2018 and 2019, respectively, compared to 16.3 million passengers in 2017.

The 2020/2021 EDR should report on:

Regional Airports

- 2020 regional airport operations, passenger activity levels, and schedule data within an historical context;
- Status of plans and new improvements as provided by the regional airport authorities;
- Regional economic factors;
- Role of the Worcester Regional Airport and Hanscom Field in the regional aviation system and Massport's efforts to promote these airports; and
- Ground access improvements.

A-31

Regional Transportation System

- Massport's role in managing the regional aviation facilities;
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership.

A-32

Ground Access to and from Logan Airport

The 2018/2019 EDR reports that average daily traffic and VMT on Airport roadways has increased in 2018 and 2019 compared to 2017. It provides data on transit ridership, roadways, traffic volumes, and parking. Specifically, the 2017 ESPR states that Massport has continued to invest in and operate Logan Airport with a goal of increasing the number of passengers arriving by transit or other HOV modes. The 2018/2019 EDR provides a discussion of ground access modes and trip generation associated with each mode including: (1) transit and shared-ride HOV services; (2) drive to Logan Airport and park; or (3) drop-off/pick-up mode, which can involve a private vehicle, taxi, limousine, or TNCs.

Average weekday on-Airport VMT increased by about 4.5 percent from 2017 to 2018. Between 2018 and 2019, average weekday on-Airport VMT increased by 2.2 percent. The change in average daily traffic can be attributed primarily to the increases in air passenger activity, passenger drop-off/pick-up, cargo, and non-aviation related Airport uses. Additionally, the use of mobile application ride-booking (RideApp) services, such as Uber and Lyft, are increasingly becoming a mode of choice for ground access at Logan Airport. RideApp transactions totaled more than 7 million in 2018 and increased to over 8 million in 2019, a growth of over 16 percent. RideApps are impacting other access modes to the Airport and contributing to on-Airport congestion. Partially due to the continued rise of RideApps, black car limousines and scheduled van ridership dropped by nearly 23 percent from 2017 to 2019. Taxi dispatches declined 14 percent in 2018 compared to 2017 and 7 percent between 2018 and 2019. The Massachusetts Bay Transportation Authority (MBTA) Blue Line ridership increased by 4 percent between 2017 and 2018 and declined by 29 percent the following year.

Based on changes in passenger mode choice for accessing Logan Airport observed between 2017 and 2019, Massport updated its goals and definition of HOV. The updated definition considers vehicle

occupancies of taxis, black car limousines, and RideApps that carry two or more air passengers per vehicle to be HOV, while the same modes with one air passenger will count as non-HOV. With this updated definition, the 2018/2019 EDR describes that Massport established a goal of 35.5 percent HOV by 2022 and 40 percent by 2027. Based on the results of the 2019 Air Passenger Ground-Access Survey, HOV mode share has reached 40.4 percent, exceeding both near-term and longer-term goals. While it is anticipated that the HOV mode share will drop as a result of COVID-19 over the short term, Massport expects HOV ridership to recover over time and remains committed to the HOV mode share goals moving forward.

The 2020/2021 EDR should report on 2020 ground access conditions at the airport and provide a comparison to 2018 and 2019 for the following:

- Description of compliance with Logan Airport Parking Freeze;
- HOV ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express);
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport VMT;
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning and the connection to the MBTA Airport Station associated with the planned Terminal E Modernization;
- Project, anticipated MBTA ridership, and possible changes in HOV mode share; and
- Trends of TNCs and their operations at Logan Airport.

A-33

The 2020/2021 EDR should address the following topics:

- Target HOV mode share and incentives;
- Impact of TNCs on Logan Airport landside operations and effectiveness of the TNC management plan;
- Update on parking conditions;
- Non-Airport through-traffic;
- Cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Silver Line, Water Transportation, and Logan Express;
- Report on efforts to increase capacity and use of Logan Express;
- Progress on enhancing water transportation to and from Logan Airport;
- Results and recommendations of the ground access study Long-term Parking Management Plan required by the Parking Freeze amendments; and
- Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.

A-34

Noise

The 2018/2019 EDR provides an update on the status of the noise environment at Logan Airport in 2018 and 2019 and describes Massport's efforts to mitigate noise exposure and impacts. As described below in greater detail, the implementation of the RNAV Pilot study being jointly undertaken by FAA

and Massport has resulted in concentration of flight patterns over certain communities and significant increases in noise exposure. The effects of this program are identified as significant concerns in the majority of comment letters. The 2018/2019 EDR provides updates of how Massport and FAA are continuing to work with the Massachusetts Institute of Technology (MIT) to investigate opportunities to reduce noise through changes to PBN, including RNAV. This cooperation is a first-in-the-nation project between FAA and an airport operator to better understand the implications of PBN and evaluate strategies to address community concerns.

The 2018/2019 EDR provides noise modeling results from the AEDT. The model requires detailed operational data as inputs for noise calculations, including numbers of operations per day by aircraft type and by time of day, which runway is used for each arrival and for each departure, and flight track geometry for each track. The 2018/2019 EDR also presents summaries of the 2018 and 2019 operational data used in the noise modeling, as well as the resultant annual Day-Night Average Sound Level (DNL) noise contours, a comparison of the modeled results with measured levels from the noise monitoring system, and estimates of the population residing within various increments of noise exposure in 2018 and 2019.

Both FAA and the U.S. Department of Housing and Urban Development consider DNL exposure levels above 65 decibels (dB) to be incompatible with residential land use. The 2018/2019 EDR describes how there was an overall decrease in the total number of people residing within the DNL 65 dB contour from 2017 to 2018. However, the number within the DNL 65 dB contour increased in Winthrop and Revere while decreasing in East Boston. From 2017 to 2018, there was an increase in total operations and in nighttime operations, but the primary factor in the DNL contour changes was a shift in 2018 back to typical runway use following the extended Runway 4L-22R closure in 2017.

Massport monitors flights that operate during the DNL nighttime period of 10:00 PM to 7:00 AM, when each modeled flight is increased by 10 dB in calculations of noise exposure. Nighttime operations during this period represented 16.1 percent and 16.6 percent of total operations in 2018 and 2019, respectively. Nighttime operations increased, from an average of 168 per night in 2017 to 187 per night in 2018 and 195 per night in 2019. This represents a total nighttime operations increase of 11.3 percent from 2017 to 2018, and another 4.4 percent from 2018 to 2019. The main increases to nighttime commercial activity were in passenger aircraft operations, primarily resulting from the overall growth in domestic air carrier flights and increased flights to international destinations. The majority (about 81 percent) of nighttime operations occurred either before midnight or after 5:00 AM.

The 2019 DNL contours are similar in shape and size to those for 2018, with small changes due to runway use shifts, increases in nighttime operations, and overall operations growth in 2019. The total number of people residing within the DNL 65 dB contour increased from 7,034 in 2018 to 8,768 in 2019. The additional population within the DNL 65 dB contour is mainly located in East Boston, primarily due to an increase in Runway 33L departures due to an increase in northwest winds in 2019. The estimated population (based on 2010 U.S. Census data) within the DNL 65 dB contour decreased by about 11 percent from 2017 to 2018 (going from 7,933 to 7,034) and increased again about 25 percent from 2018 to 2019 (to 8,768). The populated area included in the 2018 DNL 65 dB contour decreased in East Boston but increased in Winthrop and Revere, as compared to 2017. The populated area within the 2019 DNL 65 dB contour increased in East Boston and Winthrop and decreased in Revere, as compared to 2018.

Due to the effects of the COVID-19 pandemic and resulting decreased aircraft operations, the EDR also included assumptions about noise in 2020 through fall 2020. Massport predicts that the reduction in operations and changes in the fleet mix will likely result in a 40 percent or larger reduction in the DNL noise contour for 2020. Due to the pandemic, several airlines have retired larger and older aircraft models. When air traffic does return, it is anticipated that the mix of aircraft types will be different than the aircraft mix documented in the 2018/2019 EDR which will be updated in the 2020/2021 EDR.

In 2018, Massport received 71,381 noise complaints from 82 communities, an increase from 59,343 noise complaints from 95 communities in 2017. In 2019, the number of complaint calls rose to 268,929 from 86 communities. The number of individual complainants decreased from 4,269 callers in 2017 to 2,178 callers in 2018, and then increased again to 2,671 callers in 2019. The increase in complaints continues to be primarily related to the FAA's RNAV departure procedures, which concentrate flight tracks along narrower corridors. Complaints rose significantly in the communities overflown by Runway 33L departures (East Boston, Medford, Arlington, Somerville, Watertown, and Winchester). The 2018/2019 EDR attributes this due to a combination of several factors: an increase in departures from Runway 33L in 2019, increased ability to submit a complaint, and increased public awareness through various community groups. Complaints from communities under the Runway 27 flight path also increased due to similar reasons, including higher use of Runway 27 for departures and increased community awareness. All complaints have been forwarded to FAA. The 2018/2019 EDR also provides an update on the Memorandum of Understanding (MOU) between Massport and FAA to frame the process for analyzing opportunities to reduce noise through changes or amendments to PBN including RNAV. The 2018/2019 EDR also states that FAA and Massport are committing to: measure and model the benefits and impacts of changing some RNAV approaches; and, test and develop an implementation plan, which will include environmental analysis and community/public outreach.

The 2018/2019 EDR identifies which noise abatement measures are being employed and reports on the status of the sound insulation program since 1990. The 2018/2019 EDR describes that Massport continues to seek funding for noise mitigation for properties that are eligible for participation in its Residential Sound Insulation Program (RSIP). In 2019, Massport updated its RSIP Noise Exposure Map contours and submitted an AEDT-derived noise exposure map to the FAA in 2020 for review and discussion. To date, Massport has provided sound insulation for a total of 36 schools and 11,515 residential units. Eligibility for sound insulation must follow FAA guidelines which requires that the residence is located within the latest DNL 65 dB contour and interior noise levels within habitable rooms of noncompatible structures must be 45 dB or greater with the windows closed.. in the 2018/2019 EDR indicated that in March 2020, the FAA issued revised guidance which, for the first time, allows residences before 1993 to be eligible for consideration for improved sound insulation. Eligibility of this category of residences is still contingent on a current, FAA approved 65DNL contour and pre-testing requirements. In March 2021, the FAA issued additional clarifications regarding this change emphasizing that current policy regarding qualification for sound insulation also applies to the categories of residences treated before 1993. As suggested in several comments, Massport updated its Noise Exposure Map contours and submitted an AEDT-derived noise exposure map to FAA in 2020 for review and discussion. The FAA requires that a submitted sound insulation program contour should represent current operational conditions; generally, the contour year should match the date of the document submittal. However, due to the significant decrease in 2020 operations caused by the COVID-

19 pandemic, Massport developed a 2019 forecast contour, including block rounding representing pre-COVID conditions , and submitted it to FAA in the summer of 2020. Once accepted by the FAA, Massport will reach out to eligible homeowners to discuss potential mitigation options for their homes, subject to federal and Massport funding availability.

The 2020/2021 EDR must provide strategies to address noise impacts which are expressed in numerous comments received on the 2018/2019 EDR. Massport should continue to implement and develop additional noise abatement measures, such as runway use restrictions and reduced-engine taxiing. Massport should also coordinate with stakeholders through the Massport Community Advisory Committee to identify opportunities to reduce noise.

A-35
A-36
A-37

The 2020/2021 EDR should also provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2020 conditions and provide a comparison to 2018 and 2019 for the following:

A-38

- Fleet Mix, including Stage II, Recertified Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft;
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals); and,
- Flight tracks.

A-39

The 2020/2021 EDR should report on the following:

- Changes in annual noise contours and noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed;
- Cumulative Noise Index (CNI);
- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and
- Flight track monitoring noise reports.

A-40

The 2020/2021 EDR should also report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) study, and provide an update on the noise and operations monitoring system. It should also report on the status of Block 1 and 2 of the RNAV Pilot Project, which will analyze the feasibility of changes to some of RNAV approaches and departures from Logan Airport.

A-41

Air Quality/Emissions Reduction

The 2018/2019 EDR provides an overview of airport-related air quality issues in 2018 and 2019 and the efforts to reduce emissions. The air quality modeling is based on aircraft operations, fleet mix characteristics, and airfield taxiing times combined with GSE usage, motor vehicle traffic volumes, and stationary source utilization rates. The 2018/2019 EDR uses FAA's approved computer model for calculating emissions from aircraft-related sources AEDT model (v. AEDT 2d). Total air quality emissions from all sources associated with Logan Airport are significantly lower than a decade ago. The 2018/2019 EDR identifies Massport's initiatives to improve air quality and reduce emissions, including: replacement of gas- and diesel-powered GSE with all-electric GSE (eGSE) by the end of 2027 (as commercially available); implementation of additional initiatives to increase HOV use, continue to

reduce emissions from Massport fleet vehicles, and encourage use of alternative fuel vehicles; and implementation of energy efficiency projects, including upgrades to the Central Heating and Cooling Plant, and increasing the use of renewable energy, such as solar and wind installations.

Massport prepared emissions inventories for 2018 and 2019 for the criteria pollutants carbon monoxide (CO), particulate matter (PM10/PM2.5), volatile organic compounds (VOCs), and oxides of nitrogen (NOx). Key findings of those emissions inventories include: total modeled emissions of CO, PM10/PM2.5 and NOx, increased from 2017 to 2018 by approximately 14 percent, 17 percent, and 4 percent, respectively. VOCs remained consistent. These increases were mainly attributable to the 5.6-percent increase in aircraft operations in 2018 compared to 2017. Variations in emissions were also due to airframe/engine combination parameters included in the two model versions used and the associated differences in applied emission factors assumed in the models. In 2019, total modeled emissions of CO, PM10/PM2.5, and VOCs each increased by about 2 percent from 2018. NOx emissions instead increased by about 5 percent. The 2018/2019 concludes these changes are also due to an increase in aircraft operations of 0.7 percent as well as slight variations in the aircraft fleet mix from 2018 to 2019. Additionally, increases in NOx emissions in 2019 are associated with higher stationary source fuel usages in that year. Modeled emissions of CO, VOC, and NOx associated with GSE and motor vehicles, many of which Massport has influence over, have declined from 2018 to 2019. Emissions of PM10/PM2.5 remain steady. While there are model version differences between 2017 and 2018, causing variances in emissions between those years, overall GSE and motor vehicles show a decreasing trend from 2017 to 2019 for all pollutants. As previously mentioned, GHG emissions also increased from 2017 to 2018 by approximately 10 percent and from 2018 to 2019 by approximately 4 percent, primarily due to the increase in aircraft operations (i.e., 5.6 percent in 2018 and 0.7 percent in 2019). Aircraft emissions continue to represent the largest source (95 percent) of NOx at Logan Airport, followed by other sources (2 percent), ground service equipment (GSE) (2 percent), and motor vehicles (1 percent).

The 2020/2021 EDR should continue to provide an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The 2020/2021 EDR should also provide discussion of progress on national and international levels to decrease air emissions. Massport should continue to use the latest version of FAA's AEDT model for air emissions modeling as was presented in the 2018/2019 EDR. The EPA Motor Vehicle Emission Simulator (MOVES) tool should continue to be used to assess vehicular emissions on airport roadways. The 2020/2021 EDR should include a mobile sources emissions inventory for CO, NOx, VOCs, and PMs. It should also report on Massport and tenant alternative fuel vehicle programs and the status of Logan Airport air quality studies undertaken by Massport or others, as available. The 2020/2021 EDR should demonstrate that Massport's programs to maintain and increase HOV modes provide the capacity to meet demand associated with growth.

A-42
A-43
A-44
A-45
A-46

Commenters continue to express concern regarding ultrafine particulates (UFPs). The 2018/2019 EDR includes information on the status of UFP review by EPA and an update on associated and monitoring. For the first time, the 2018/2019 EDR includes information about research into the health impacts of aviation. I appreciate Massport including this information and expect that the 2020/2021 EDR will include an update on it. The 2020/2021 EDR should also provide an update on the status and the findings of UFP research being performed by Tufts University and Boston University regarding the identification of airport-specific related UFPs in an urban environment. The 2020/2021 EDR should present more direct information about the major research findings around health and airport impacts in

A-47
A-48

relation to emissions, including likely pollution and noise health impacts, and commitments from Massport for the reduction and mitigation of these impacts. A-48

Since October 2014, as a result of the Department of Public Health's (DPH) Logan Airport Health Study, Massport has provided funding for the East Boston Neighborhood Health Center (EBNHC) to enhance services and educational resources for children and adults in East Boston and Winthrop who are managing asthma and/or Chronic Obstructive Pulmonary Disease (COPD). Massport should continue to fund this program and should consult with the EBNHC to evaluate opportunities to expand current services, outreach, and prevention materials. This expanded effort should include collaboration with East Boston and Winthrop public school nurse coordinators to identify additional high risk individuals in schools and ways to expand outreach efforts. The 2020/2021 EDR should include an update on the status of this collaboration effort. Massport indicates that they contacted the EBNHC in early January 2020 regarding supplementing the Massport-funded Asthma Home Visiting program with HEPA filters; however this was not identified as the best strategy for this program. The 2020/2021 EDR should describe how Massport will reengage with the Health Center and include a discussion of how the services provided directly to and through the Health Center (which are funded by Massport) can be expanded. I encourage Massport to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. A-49

Water Quality/Environmental Compliance

The 2018/2019 EDR describes Massport's ongoing environmental management activities including National Pollutant Discharge Elimination System (NPDES) compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management. Massport's primary water quality goal is to prevent or minimize pollutant discharges, to limit adverse water quality impacts of airport activities. Massport employs several programs to promote awareness of activities that may impact surface and groundwater quality. Programs include implementing best management practices (BMPs) for pollution prevention by Massport, its tenants, and its construction contractors; training of staff and tenants; and a comprehensive stormwater pollution prevention plan.

The 2020/2021 EDR should identify any planned stormwater management improvements and report on the status of:

- NPDES Permit and monitoring results for Logan outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- MCP activities;
- Tank management;
- Update on the environmental management plan; and
- Fuel spill prevention.

A-50

Conclusion

Massport may prepare a 2020/2021 EDR for submission consistent with the Scope included in this Certificate. As noted above, although unlikely for the 2020/2021 EDR and 2021 EDR, should actual growth in passenger and/or aircraft operations outpace the forecasts, I expect that additional information will be provided in future EDRs to demonstrate that additional mitigation and policies and strategies will

be implemented to address the proportional growth in impacts.

K. Theoharides

March 19, 2021
Date

Kathleen A. Theoharides

Comments received:

01-25-21 Steve Kaiser
02-22-21 Emma Uppal
02-22-21 Sheila Mooney
03-01-21 Nancy S. Timmerman
03-02- 21Steve Kaiser 2nd comment
03-08-21 Eleanor Kebabian
03-10-21 Sonja Tengblad
03-10-21 Teresa Doyle
03-12-21 AIR Inc.
03-12-21 Alyssa Vangeli
03-12-21 Carla Ceruzzi
03-12-21 Carrie Van Horn
03-12-21 Conservation Law Foundation
03-12-21 Dave Matheu
03-12-21 DOER
03-12-21 Tania Castro-Daunais
03-12-21 Town of Milton
03-12-21 Massachusetts Chapter of the Sierra Club
03-15-21 Carol Walker
03-15-21 Frederick Salvucci

KAT/ACC/acc

Comment #	Author	Topic	Comment	Response
A-1	Kathleen Theoharides, Secretary	Forecasts/Growth	While activities and operations have decreased due to the COVID-19 pandemic, the next EDR should describe the methodology for the forthcoming future forecast which should be provided in the 2022 ESPR.	This combined *2020/2021 Environmental Data Report (EDR)* follows the requirements of the Secretary's Certificate on the *2018/2019 EDR* , dated March 19, 2021. Chapter 2, *Activity Levels,* presents context on the *2017 Environmental Status and Planning Report (ESPR)* forecast, impacts of COVID-19, and describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic.
A-2	Kathleen Theoharides, Secretary	Analysis Years/Scope	Additionally, I am requiring that Massport file a combined 2020/2021 EDR given that 2020 activity levels, if considered in isolation, would not provide a clear and complete indication of post-pandemic growth trends.	This combined *2020/2021 EDR* follows the requirements of the Secretary's Certificate on the *2018/2019 EDR* , dated March 19, 2021. The document reports on 2020 and 2021 conditions with a comparison to 2019 conditions, and describes pandemic related impacts and trends that may influence activity levels moving forward.
A-3	Kathleen Theoharides, Secretary	Stakeholder Outreach	I expect that Massport will continue their ongoing consultation and share data regarding observed trends with the Massport Community Advisory Committee (CAC) and other stakeholder groups as these documents are being developed.	Massport has conducted, and will continue to conduct ongoing consultation and share data regarding observed trends, with the Massport Community Advisory Committee (CAC) (monthly and quarterly meetings) and other stakeholder groups during the development of the *2020/2021 EDR* and future documents. Massport also publishes monthly flight, passenger, and cargo activity statistics on Massport.com.
A-4	Kathleen Theoharides, Secretary	Planning/Mitigation	I expect that the 2020/2021 EDR will include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. The EDR should also include a description of the economic, financial, or other factors that will inform this decision.	The *2020/2021 EDR* provides information on the factors that are used to inform the timing of implementation of deferred capital projects, along with any mitigation commitments associated with these projects. Chapter 2, *Activity Levels,* discusses the impacts of air travel, and economic considerations. Chapter 3, *Airport Planning* , discusses the status and approach of the deferred capital projects. Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , discusses planned mitigation for projects underway. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects develop.
A-5	Kathleen Theoharides, Secretary	Content/Scope	In addition to responding to these comments, the 2020/2021 EDR should report on the progress and other refinements for tracking noise, traffic, and air emissions and abatement efforts, as further described in the Scope below.	This combined *2020/2021 EDR* follows the requirements of the Secretary's Certificate on the *2018/2019 EDR* , dated March 19, 2021. Each of these topics are addressed in separate sections, and describes findings from 2020 and 2021, with comparisons to 2019 conditions.
A-6	Kathleen Theoharides, Secretary	Mitigation	The 2020/2021 EDR should document potential impacts and trends and propose measures to avoid, minimize and mitigate environmental impacts.	Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking,* provides updated information regarding the status of Massport and tenant Section 61 Findings associated with projects that were subject to the Massachusetts Environmental Policy Act (MEPA) and have mitigation commitments documented in Section 61 Findings. As has been the convention in previous *EDRs/ESPRs* , the annual filings focus on commitments that are pending, underway (generally for active construction), or continuing. Once a specific mitigation measure or group of measures is complete for a specific project, their status is no longer reported. The EDRs and ESPRs provide context for specific projects that go through the MEPA process. A key new initiative that Massport is pursuing is a commitment to reduce greenhouse gas emissions under Massport's control to net zero by 2031. Information on Massport's *Roadmap to Net Zero by 2031* can be found at https://www.massport.com/massport/about-massport/roadmap-to-net-zero/.

Comment #	Author	Topic	Comment	Response
A-7	Kathleen Theoharides, Secretary	Content/Scope	The 2020/2021 EDR must include information on the environmental policies and planning that form the context of environmental reporting, technical studies, and environmental mitigation initiatives against which projects at Logan Airport can be evaluated. This should include identification of the cumulative effects of Logan Airport operations and activities.	A primary goal of the EDRs and ESPRs (and earlier iterations) are to describe the cumulative impacts associated with overall Logan Airport operations, and compares them year-over-year to previous and anticipated conditions. These documents inform the projects that are subject to MEPA (and the National Environmental Policy Act [NEPA]) and serve as baseline condition against which to assess project-specific impacts. Chapter 5, *Ground Access to and from Logan Airport* , Chapter 6, *Noise Abatement* , Chapter 7, *Air Quality/Emissions Reduction* , and Chapter 8, *Environmental Compliance and Management/Water Quality* include the regulatory framework that guide these analyses. Each project that is subject to MEPA follows this framework in their impact assessments and development of mitigation strategies, if needed. The status of mitigation measures associated with projects' Section 61 Findings are documented in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* .
A-8	Kathleen Theoharides, Secretary	Ground Access	The results of the Logan Airport Air Passenger Ground Access Survey and the Long-term Parking Management Plan should inform transportation planning and strategies to achieve the HOV mode share goal.	The results of the *2019 Logan Air Passenger Ground-Access Survey* informed the high-occupancy vehicle (HOV) and ground access strategy that was in place through early 2020. Chapter 5, *Ground Access to and from Logan Airport* describes all aspects of the strategy and implementation. This strategy was necessarily adjusted in 2020 once the effects of the pandemic began to affect passenger and employee ground access behavior. These strategies are evaluated on an ongoing basis to adapt to the changes associated with the pandemic and the resultant passenger and employee demands for Airport access. In spring 2022, a new Logan Air Passenger Ground-Access Survey was conducted to help Massport understand changing travel patterns. The next filing in this process will provide an overview of the survey and ways the new data are being used.
A-9	Kathleen Theoharides, Secretary	Content/Scope	The 2020/2021 EDR must include copies of all ESPR and EDR Certificates and a distribution list (indicating those receiving documents, CDs, or Notices of Availability). Supporting technical appendices should be provided as necessary.	Appendix A include copies of the Secretary's Certificate on the *2018/2019 EDR* and previous ESPR and EDR Certificates. Appendix D provides a distribution list of all individuals who received copies of this *2020/2021 EDR* through an email with online link, Notice of Availability with online link, or a hard copy. Supporting appendices are provided for each technical chapter.
A-10	Kathleen Theoharides, Secretary	Response to Comments	The Response to Comments section should address all of the substantive comments on the 2018/2019 EDR, and other Certificates for Logan Airport that reference EDR/ESPR documentation (e.g. Logan Airport Parking Project (EEA# 15665), Terminal E Modernization (EEA# 15434)). To ensure that the issues raised by commenters are addressed, the 2020/2021 EDR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the EDR beyond what has been expressly identified in this Certificate. The Response to Comments should not reference a section of the EDR unless they are directly responsive to the comment.	Appendices A and B include copies of the Secretary's Certificate on the *2018/2019 EDR* and all the comment letters received on the *2018/2019 EDR,* along with responses to comments. The Certificate and each comment letter have individual comments delineated and numbered for review. Each comment is addressed and where appropriate, specific sections in the chapters are referenced. Responses to comments received on project-specific filings are included within those project filings.

Comment #	Author	Topic	Comment	Response
A-11	Kathleen Theoharides, Secretary	Response to Comments	Common themes that should be addressed throughout the EDR and in the Responses to Comments include noise (modeling of noise contours and noise abatement) and emissions reduction issues. The EDR should also include sufficient information to address comments on air quality and public health which are common concerns of commenters.	Common themes, including noise contours modeling, noise abatement, and air emissions strategies, are addressed throughout the *2020/2021 EDR* . Massport continues to present information on research findings on public health, including noise and air emissions. Refer to the summaries of ongoing noise studies in Chapters 6, *Noise Abatement* and study findings on impacts of aviation emissions on air quality and public health in Chapter 7, *Air Quality/Emissions Reduction* . Massport will continue to advance strategies for reducing overall Logan Airport-related impacts. Chapter 7, *Air Quality/Emissions Reduction,* provides updated information regarding recent and ongoing scientific studies associated with airport emissions including the *Logan Airport Health Study by Massachusetts Department of Health* (2014), *Impacts of Aviation Emissions on Near-Airport Residential Air Quality by Tufts University* (2020), and similar airport-related health studies by the University of Southern California and University of Washington. The findings show key differences exist in the particle size distribution and the black carbon concentration for roadway and aircraft features.
A-12	Kathleen Theoharides, Secretary	Mitigation	As indicated in the 2017 ESPR, Massport needs to ensure mitigation is being provided commensurate with increased growth and associated impacts.	As of the filing of this *2020/2021 EDR* , Logan Airport continues to recover from reduction in demand from the COVID-19 pandemic. The effects of COVID-19 on the aviation industry and Logan Airport continue to evolve. As a result, the *2022 ESPR* will provide an updated forecast, reflecting latest activity trends as well as industry changes that are reshaping aviation in the U.S. Details of the forecast methodology can be found in Chapter 2, *Activity Levels* . Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , and will continue to be refined as growth and activity levels increase. It should be noted that in certain cases, notably ground access, some HOV services were adjusted during 2020 and 2021 to align with ridership demand. Many of those services are designed to provide frequent, cost-effective alternatives to single occupancy vehicles which cause local congestion and emissions. As passenger demand dropped precipitously, so did the need for the HOV services at that time. Massport continuously tracks trends and works to ensure that these services are restored in line with or ahead of growth to ensure that HOV demand could be appropriately met.
A-13	Kathleen Theoharides, Secretary	Forecasts/Growth	I expect that future EDRs will include additional information if actual growth in passenger and/or aircraft operations outpace the forecasts. Specifically, the EDR(s) should explain the circumstances that caused the growth, describe how this may affect the impact forecasts, and identify mitigation and policy strategies that will be implemented to address the proportional growth in impacts.	As of the filing of this *2020/2021 EDR* , Logan Airport continues to recover from reduction in demand from the COVID-19 pandemic. The effects of COVID-19 on the aviation industry and Logan Airport is evolving. As a result, the *2022 ESPR* will provide an updated forecast, reflecting latest trends as well as industry changes that are reshaping aviation in the U.S. Details of the forecast methodology can be found in Chapter 2, *Activity Levels* . Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , and will continue to be refined as growth and activity levels increase.

Comment #	Author	Topic	Comment	Response
A-14	Kathleen Theoharides, Secretary	Planning/Mitigation	In addition, as noted above, the future EDRs should include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. The EDR should also include a description of the economic, financial, or other factors that will inform this decision.	The *2020/2021 EDR* provides information on the decision making process and factors that are used to inform the timing of implementation of deferred capital projects, along with mitigation commitments associated with these projects. Chapter 2, *Activity Levels,* discusses the impacts of anticipated increased air travel, and economic considerations. Chapter 3, *Airport Planning* , discusses the status and approach of the deferred capital projects. Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , discusses planned mitigation for projects underway. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects develop.
A-15	Kathleen Theoharides, Secretary	Forecasts/Growth	I continue to reserve the right to require that future ESPRs evaluate a range of activity forecasts based on the results of this interim reporting.	The *2017 ESPR* included a forecast of up to 50 million annual passengers. The 2020 passenger levels fell to approximately 13 million passengers, and increased to approximately 23 million passengers in 2021. The 2020 annual passenger levels have not been seen since the mid-1970s. As of the filing of this *2020/2021 EDR* , Logan Airport continues to be in a slow recovery phase from reduction in demand from the COVID-19 pandemic. The effects of COVID-19 on the aviation industry and Logan Airport is evolving. As a result, the *2022 ESPR* will provide an updated forecast, reflecting latest trends as well as industry changes that are reshaping aviation in the U.S. Details of the forecast methodology can be found in *Chapter 2, Activity Levels* .
A-16	Kathleen Theoharides, Secretary	Air Quality/Noise/ Planning/Mitigation	I also expect that air and noise emissions related to passenger and activity levels and planning/mitigation will be a significant emphasis of the 2020/2021 EDR.	Air and noise emissions related to activity levels and annual passengers are discussed in Chapter 6, *Noise Abatement* , and Chapter 7, *Air Quality/Emissions Reduction* . Chapter 3, *Airport Planning* , and Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , discuss project planning and project-specific mitigation.
A-17	Kathleen Theoharides, Secretary	Ground Access	The 2020/2021 EDR should report on the effectiveness of the TNC management plan and provide an update on planned and executed measures to relieve on-Airport roadway congestion including updates on the Logan Airport Parking Project.	Massport aims to reduce the number of private vehicles that access Logan Airport and, in particular, reduce the associated environmentally undesirable drop off/pick-up modes, which generate up to four vehicle trips instead of two and contribute to greater terminal area roadway congestion. In 2017, Massport initiated RideApp (e.g., Uber and Lyft, previously referred to as transportation network companies [TNCs]) pick-up and drop-off operations. Table 5-6 in Chapter 5, *Ground Access to and from Logan Airport,* presents the policies that Massport has implemented to manage the RideApp operations and status of each. Additionally, reduced fees are offered for shared rides. Terminal B RideApp pick-up and drop-off operations from the ground floor of the Central Garage are in the process of being moved to the second floor of the Terminal B Garage. This will provide 60 spaces, including three Americans with Disabilities Act (ADA) accessible and four electric vehicle (EV) spaces. This new location is antipated to open in November 2022. Massport is continuing to promote Logan Express ridership by expanding parking, frequency, and facility upgrades, thereby reducing vehicle miles traveled (VMT), congestion, and air quality emissions. Details of this goal are described in Chapter 5, *Ground Access to and from Logan Airport* . Details of the 2020 and 2021 VMT modeling results are presented in Chapter 5, *Ground Access to and from Logan Airport* , and Appendix G. The Logan Airport Parking Project has been deferred due to the reduction in passenger activity associated with the pandemic.

Comment #	Author	Topic	Comment	Response
A-18	Kathleen Theoharides, Secretary	Ground Access/Planning/ Mitigation	As noted above, several measures to improve the use of HOV and reduce VMT have been deferred, including the expansion of the Framingham Logan Express Garage (EEA# 16168), opening a new Logan Express suburban location, and implementing a second urban Logan Express Service at North Station. The 2020/2021 EDR should include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. To the extent feasible, the EDR should identify the metrics, monitoring data, or other criteria that will be used to inform when these measures will be implemented based on future increases in demand for air travel as the economy recovers.	The *2020/2021 EDR* provides information on the decision making process and factors that are used to inform the timing of implementation of deferred capital projects, along with mitigation commitments associated with these projects. Chapter 2, *Activity Levels* , and Chapter 3, *Airport Planning* , detail capital planning decisions, impacts of anticipated increased air travel, and economic considerations. Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , discusses planned mitigation. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects develop. The *2020/2021 EDR* provides the best available metrics and monitoring data that are used to inform when these measures will be implemented.
A-19	Kathleen Theoharides, Secretary	Activity Levels	The 2020/2021 EDR should also report on: • Aircraft operations, including fleet mix and scheduled airline services at Logan Airport; • Domestic and international passenger activity levels; • Cargo and mail volumes; • Comparison of 2020 operations and passenger activity levels to 2018/2019 activity levels; and • National aviation trends compared to Logan Airport trends.	Chapter 2, *Activity Levels* describes aircraft operations and passenger activity, domestic and international passenger activity levels, cargo and mail volumes, and national aviation trends compared to Logan Airport trends during 2020 and 2021, and compares the findings to those for 2018 and 2019 and selected prior years.
A-20	Kathleen Theoharides, Secretary	Sustainability	The 2020/2021 EDR should provide updates to airport wide sustainability goals.	Chapter 1, *Introduction/Executive Summary* provides updates to Massport's sustainability and resiliency program. In addition, Massport reports on progress towards resiliency goals in its *Annual Sustainability & Resiliency Reports* . In March 2022, Massport released it *Net Zero Roadmap by 2031* which identifies pathways to reaching Net Zero by 2031 (Massport's 75th anniversary) for its Scope 1 and 2 greenhouse gas (GHG) emissions. Initial implementation of this program is now underway. Future EDR/ESPR filings will provide update on progress on this initiative. Additional information about Massport's resiliency initiatives is available at: http://www.massport.com/massport/business/capital-improvements/sustainability/climate-change-adaptation-and-resiliency/.

Comment #	Author	Topic	Comment	Response
A-21	Kathleen Theoharides, Secretary	GHG Emissions	The 2020/2021 EDR should incorporate GHG emissions reporting consistent with that provided in the 2018/2019 EDR which was normalized to support effective review and analysis. In addition, Massport should ensure that only conditioned (heated and cooled, enclosed buildings) building areas are included in energy use and emission intensity calculations, report input energy components (oil, gas, electricity) and central plant data, and clarify how renewable energy is accounted for in the analysis.	The 2020 and 2021 GHG emission analyses in this EDR follow the Executive Office of Energy and Environmental Affairs (EEA) guidelines and use widely-accepted emission factors that are considered appropriate for airports, including Intergovernmental Panel on Climate Change (IPCC) and U.S. Environmental Protection Agency (EPA), as well as being consistent with Airport Cooperative Research Program (ACRP) guidance. For consistency and comparative purposes, the 2020 and 2021 GHG emissions are segregated by ownership and control into categories. These categories are further characterized by the degree of control that Massport has over the GHG emission sources including: Category 1: Massport Owned, Category 2: Tenant Owned, and Category 3: Public/Private Owned. Starting with the *2016 EDR*, Massport has augmented its GHG reporting to include the following metrics: -GHG emissions (Scopes 1 and 2) per passenger (pounds [lbs.] of CO_2 per passenger); -Building energy use intensity (thousand British thermal units [kBTU] per square foot); and -Building GHG emissions per square foot (lbs. CO_2e per square foot). Refer to Chapter 7, *Air Quality/Emissions Reduction* for this information.
A-22	Kathleen Theoharides, Secretary	GHG Emissions	I encourage Massport to consider the recommendations identified in comments from the Department of Energy Resources (DOER) which recommend electrification of space and water heating as well as evaluation of opportunities for distributed renewable energy generation. Massport should consult with the MEPA Office and the DOER regarding presentation of GHG data in the 2020/2021 EDR.	Massport continues to review its heating and cooling options to find the most energy and cost effective approaches, using existing infrastructure, heating sources, and Airport operations. Department of Energy Resources (DOER) recommendations will be considered and evaluated for future opportunities. Massport has and will continue to consult with the MEPA Office and the DOER regarding GHG data. In March 2022, Massport released its *Net Zero Roadmap by 2031* which identifies pathways to reaching Net Zero by 2031 (Massport's 75th anniversary) for its Scope 1 and 2 GHG emissions. Initial implementation of this program is now underway. Future EDR/ESPR filings will provide update on progress on this initiative.
A-23	Kathleen Theoharides, Secretary	GHG Emissions	In the 2020/2021 EDR, GHG emissions should continue to be quantified for aircraft, GSE, motor vehicles, and stationary sources using emission factors and methodologies outlined in the Greenhouse Gas Emissions Policy and Protocol issued by EEA and the Transportation Research Board's Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories as developed for the 2018/2019 EDR. The results of the 2020 GHG emissions inventory should be compared to the 2018 and 2019 results.	Chapter 7, *Air Quality/Emissions Reduction* presents the GHG methodology and inputs and compares results from 2020 and 2021 to 2018 and 2019 findings. The 2020 and 2021 GHG emission analyses follow EEA guidelines and use widely-accepted emission factors that are considered appropriate for airports, including IPCC and EPA, as well as being consistent with ACRP guidance. Although the *2020/2021 EDR* is not subject to the MEPA GHG policy (because it does not propose any discrete projects), since the *2007 EDR*, Massport has continued to voluntarily prepare an inventory of GHG emissions both directly and indirectly associated with the Airport. The emission source categories in the *2020/2021 EDR* satisfy MEPA's requirement to analyze the environmental impacts of direct and indirect mobile and stationary source emissions. In March 2022, Massport released its *Net Zero Roadmap by 2031* which identifies pathways to reaching Net Zero by 2031 (Massport's 75th anniversary) for its Scope 1 and 2 GHG emissions. Initial implementation of this program is now underway. Future EDR/ESPR filings will provide update on progress on this initiative. While Massport can only directly control our Scope 1 and 2 emissions, we are also looking at new and evolving Scope 3 GHG reduction strategies which dominate Logan Airport-based emissions.

Comment #	Author	Topic	Comment	Response
A-24	Kathleen Theoharides, Secretary	Resiliency	The 2020/2021 EDR should continue to identify which recommendations will be implemented by Massport to improve resiliency.	Massport's continuing resiliency strategies and measures are presented in Chapter 1, *Introduction/Executive Summary* . Massport has completed an Authority-wide risk assessment, as part of its strategic planning initiative; issued a *Floodproofing Design Guide* ; and developed a resilience framework to provide consistent metrics for short- and long-term planning and protection of its critical facilities and infrastructure. Beyond infrastructure resiliency, Massport is also focused on incorporating social and economic resilience into its long-term operational and capital planning. Massport's *Floodproofing Design Guide* was published in November 2014 and updated in November 2018. Massport reports on progress towards resiliency goals in its *Annual Sustainability & Resiliency Reports* . Additional information about Massport's resiliency initiatives is available at: http://www.massport.com/massport/business/capital-improvements/sustainability/climate-change-adaptation-and-resiliency/.
A-25	Kathleen Theoharides, Secretary	Air Quality/Public Health	As the effects of climate change progress, I encourage Massport to consider its ability to reduce negative air quality effects as a matter of public health, and to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. As discussed below, the 2020/2021 EDR should report on findings regarding health and airport impacts in relation to emissions, as well as measures to reduce these impacts.	Chapter 7, *Air Quality/Emissions Reduction* provides updated information regarding recent and ongoing scientific studies associated with airport emissions including the *Logan Airport Health Study* by Massachusetts Department of Health (2014), *Impacts of Aviation Emissions on Near-Airport Residential Air Quality* by Tufts University (2020), and similar airport-related health studies by the University of Southern California and University of Washington. The findings show key differences exist in the particle size distribution and the black carbon concentration for roadway and aircraft features. Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. This includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, and aircraft towing requirements. Massport has also begun a program to electrify, where possible, airfield ground service equipment (GSE). Massport continues to work with the Federal Aviation Administration (FAA), research institutions like the Massachusetts Institute of Technology (MIT), Boston University, and Tufts University to look for ways to reduce impacts and expand research including on ultrafine particles (UFPs). Chapter 7, *Air Quality/Emissions Reduction* , provides an update on its ongoing collaboration and evolving service strategy with the Massachusetts Department of Public Health (DPH) and East Boston Neighborhood Health Center. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.

Comment #	Author	Topic	Comment	Response
A-26	Kathleen Theoharides, Secretary	Mitigation	The 2020/2021 EDR should continue to report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review. It should update the status of Massport's mitigation commitments and also identify projects for which mitigation is complete.	Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* provides updated information regarding the status of Massport and tenant Section 61 Findings and associated mitigation commitments. As has been the convention in previous *EDRs/ESPRs*, the annual filings focus on commitments that are pending, underway (generally for active construction), or continuing. Once a specific mitigation measure or group of measures is complete, their status is no longer reported.
A-27	Kathleen Theoharides, Secretary	Airport Planning	The 2020/2021 EDR should continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport must accommodate and guide tenant development. The EDR should describe the status of planning initiatives for the following areas: • Roadways and Airport Parking; • Terminal Area; • Airside Area; • Service and Cargo Areas; • Airport Buffers and Landscaping; and, • Energy, Sustainability, and Resiliency.	Chapter 3, *Airport Planning* provides updated information regarding ongoing and potential future projects aimed at improving Logan Airport's operations and services. This includes a status of Massport projects that have been reduced in scale or deferred as a result of the COVID-19 pandemic. Planning initiatives for the requested topics are discussed in Chapter 3, *Airport Planning*.
A-28	Kathleen Theoharides, Secretary	Airport Planning	The 2020/2021 EDR should also indicate the status of long-range planning activities, including the status of public works projects implemented by other agencies within the boundaries of Logan Airport.	This *2020/2021 EDR* provides updates on Massport and other pertinent planning projects though September 2022. Refer to Chapter 3, *Airport Planning*. Due to the COVID-19 pandemic and associated passenger, operations, and revenue reductions, Massport continues to adjust the timing and schedules for current and previously planned projects as well as ground access programs. The *2020/2021 EDR* provides updates, as available.
A-29	Kathleen Theoharides, Secretary	Airport Planning/Ground Access	The 2020/2021 EDR should provide an update on Logan Airport Parking project, including a description of the decision making process and factors that will be used to inform the timing of its implementation. To the extent feasible, the EDR should identify the metrics, monitoring data, or other criteria that will be used to inform when it will be implemented based on future increases in demand for air travel as the economy recovers.	The Logan Airport Parking Project has been deferred due to the reduction in passenger activity associated with the pandemic. The *2020/2021 EDR* provides information on the decision making process and factors that are used to inform the timing of implementation of deferred capital projects (refer to Chapter 3, *Airport Planning*), along with mitigation commitments associated with these projects (refer to Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking)*. Chapter 2, *Activity Levels*, details decisions, passenger-related factors, and economic considerations. Consideration is given to passenger activity levels, fleet mix decisions by airlines, route planning, and tracking of international aviation trends to determine and prioritize capital projects. Safety projects are always prioritized by Massport.
A-30	Kathleen Theoharides, Secretary	Ground Access	The 2020/2021 EDR should identify the status and assess the effectiveness of ground access changes, including roadway and parking projects, that consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on streets in adjacent neighborhoods.	This *2020/2021 EDR* provides updates on Massport and other pertinent ground access projects though September 2022. Refer to Chapter 3, *Airport Planning*. Massport will continue to look at opportunities to shift drop-off/pick-up activity to HOV modes and acknowledge the local and regional benefits of doing so.

Comment #	Author	Topic	Comment	Response
A-31	Kathleen Theoharides, Secretary	Regional Transportation	The 2020/2021 EDR should report on: *Regional Airports* • 2020 regional airport operations, passenger activity levels, and schedule data within an historical context; • Status of plans and new improvements as provided by the regional airport authorities; • Regional economic factors; • Role of the Worcester Regional Airport and Hanscom Field in the regional aviation system and Massport's efforts to promote these airports; and • Ground access improvements.	Logan Airport is the centerpiece of the three airports owned and operated by Massport. It is the primary international and domestic airport operating within the network of New England regional airports. Massport also owns and operates Worcester Regional Airport and Hanscom Field; both of which play important roles in the New England regional transportation system. Chapter 4, *Regional Transportation* presents information on the New England regional airports and regional aircraft operations and air passenger activity level trends, and updates on local and regional long-ranges transportation planning.
A-32	Kathleen Theoharides, Secretary	Regional Transportation	The 2020/2021 EDR should report on: *Regional Transportation System* • Massport's role in managing the regional aviation facilities; • Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and • Report on metropolitan and regional rail initiatives and ridership.	Massport owns and operates Worcester Regional Airport and Hanscom Field; both of which play important roles in the New England regional transportation system. Chapter 4, *Regional Transportation* presents information on the New England regional airports, regional aircraft operations and air passenger activity level trends, updates on local and regional long-ranges transportation planning, and metropolitan and regional rail initiatives and ridership.
A-33	Kathleen Theoharides, Secretary	Ground Access	The 2020/2021 EDR should report on 2020 ground access conditions at the airport and provide a comparison to 2018 and 2019 for the following: • Description of compliance with Logan Airport Parking Freeze; • HOV ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express); • Logan Airport Employee Transportation Management Association (Logan TMA) services; • Logan Airport gateway volumes; • On-airport traffic volumes; • On-airport VMT; • Parking demand and management (including rates and duration statistics); • Status of long-range ground access management strategy planning and the connection to the MBTA Airport Station associated with the planned Terminal E Modernization; • Project, anticipated MBTA ridership, and possible changes in HOV mode share; and • Trends of TNCs and their operations at Logan Airport.	Chapter 5, *Ground Access to and from Logan Airport* presents this information, as available. Massport has a comprehensive, multi-pronged, trip reduction strategy to diversify and enhance ground transportation options for passengers and employees traveling to and from Logan Airport. The ground transportation strategy is designed to offer passengers traveling to and from Logan Airport with a choice of HOVs, transit, and shared-ride options that are convenient and reliable, and that reduce environmental and community impacts.

Comment #	Author	Topic	Comment	Response
A-34	Kathleen Theoharides, Secretary	Ground Access	The 2020/2021 EDR should address the following topics: • Target HOV mode share and incentives; • Impact of TNCs on Logan Airport landside operations and effectiveness of the TNC management plan; • Update on parking conditions; • Non-Airport through-traffic; • Cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Silver Line, Water Transportation, and Logan Express; • Report on efforts to increase capacity and use of Logan Express; • Progress on enhancing water transportation to and from Logan Airport; • Results and recommendations of the ground access study Long-term Parking Management Plan required by the Parking Freeze amendments; and • Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.	Chapter 5, *Ground Access to and from Logan Airport* presents this information for 2020 and 2021. Since March 2020, air traffic and passenger activity levels have been significantly affected by concerns about COVID-19. Within that context, Massport continues to evaluate and plan for the recovery of air passenger activity and remains committed to implementing the broad range of ground access strategies that are outlined throughout the chapter. The schedule for those improvements will be adjusted according to the current conditions.
A-35	Kathleen Theoharides, Secretary	Noise	The 2020/2021 EDR must provide strategies to address noise impacts which are expressed in numerous comments received on the 2018/2019 EDR.	Massport strives to minimize the noise effects of Logan Airport operations on its neighbors through a variety of noise abatement programs, procedures, studies, and other tools. Chapter 6, *Noise Abatement* , provides information on noise impacts and abatement strategies. In March 2021, the FAA notified Massport that the agency has approved for re-sound insulation consideration homes that were treated pre-1993. Massport has begun an initial phase of a multi-phase effort to re-test and sound insulate homes that meet FAA criteria.
A-36	Kathleen Theoharides, Secretary	Noise	Massport should continue to implement and develop additional noise abatement measures, such as runway use restrictions and reduced-engine taxiing.	At Logan Airport, Massport implements one of the longest standing and most extensive noise abatement programs of any airport in the nation. Massport's comprehensive noise abatement program includes a dedicated Noise Abatement Office; an industry leading Noise and Operations Monitoring System (NOMS); extensive residential and school sound insulation programs; time of day and runway restrictions for noisier aircraft; ground run-up procedures; and flight tracks designed to optimize over water operations (especially during nighttime hours). Chapter 6, *Noise Abatement* , provides information on noise abatement strategies. The latest example of Massport ongoing efforts is the Area Navigation (RNAV) Study (completed in 2021), which was a joint effort between the FAA and Massport with the technical work by MIT. The study included extensive community outreach, including the Massport Community Advisory Committee (CAC). The study assessed the impacts of the FAA's introduction of new, more precise flight procedures and made recommendation to reduce impacts. To date, two recommendations have been implemented and two more are under FAA review.

Comment #	Author	Topic	Comment	Response
A-37	Kathleen Theoharides, Secretary	Noise	Massport should also coordinate with stakeholders through the Massport Community Advisory Committee to identify opportunities to reduce noise.	Massport has conducted and will continue ongoing consultation and share data regarding observed trends with the Massport CAC and other stakeholder groups during the development of the *2020/2021 EDR* and future documents. Chapter 6, *Noise Abatement* , documents its stakeholder involvement activities regarding noise. Massport (and the FAA) provide industry and Airport updates to Massport CAC, answer specific questions from the membership, and provide project-focused presentations.
A-38	Kathleen Theoharides, Secretary	Noise	The 2020/2021 EDR should also provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling.	Chapter 6, *Noise Abatement* and Appendix H describe the runway use, fleet mix, level of operations, noise levels, and modeled noise conditions at Logan Airport related to aircraft operations during 2020 and 2021. It compares the findings to those for 2018 and 2019 and selected prior years, and background information on the science of noise, regulatory framework,
A-39	Kathleen Theoharides, Secretary	Content/Noise	The chapter should report on 2020 conditions and provide a comparison to 2018 and 2019 for the following: • Fleet Mix, including Stage II, Recertified Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft; • Nighttime operations; • Runway utilization (report on aircraft and airline adherence with runway utilization goals); and, • Flight tracks.	Chapter 6, *Noise Abatement* describes the runway use, fleet mix, level of operations, noise levels, and modeled noise conditions at Logan Airport related to aircraft operations during 2020 and 2021 and compares the findings to those for 2018 and 2019 and selected prior years.
A-40	Kathleen Theoharides, Secretary	Noise	The 2020/2021 EDR should report on the following: • Changes in annual noise contours and noise-impacted population; • Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed; • Cumulative Noise Index (CNI); • Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and • Flight track monitoring noise reports.	Chapter 6, *Noise Abatement* describes noise conditions for 2020 and 2021 which were assessed primarily through detailed computer modeling, supplemented by the analysis of measured noise levels from Logan Airport's noise monitoring system. This *2020/2021 EDR* provides information on noise conditions using the latest FAA noise modeling software, the AEDT. Noise analysis results include day-night average sound level (DNL) noise contours and estimates of the population residing within various increments of noise exposure for 2020 and 2021. This chapter also includes a comparison of the modeled results with measured levels for 2020 and 2021 from the noise monitoring system. Supplemental noise metrics include Logan Airport's Cumulative Noise Index (CNI), Time Above (TA) various threshold sound levels, and periods of dwell and persistence of noise levels to provide a better understanding of the noise environment. Massport also provides a progress report on ongoing noise abatement measures and any new noise abatement initiatives affecting Logan Airport.

Comment #	Author	Topic	Comment	Response
A-41	Kathleen Theoharides, Secretary	Noise	The 2020/2021 EDR should also report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) study, and provide an update on the noise and operations monitoring system. It should also report on the status of Block 1 and 2 of the RNAV Pilot Project, which will analyze the feasibility of changes to some of RNAV approaches and departures from Logan Airport.	Chapter 6, *Noise Abatement* presents information on an Environmental Assessment (EA) developed by FAA to support a permanent RNAV (GPS) approach procedure for Runway 4L. This project will provide a de-conflicted stabilized approach procedure that includes vertical and lateral guidance for when weather or winds require an aircraft to land on Runway 4L. The FAA provided regular status updates to the Massport CAC. The Draft EA was available for public review, and FAA held public workshops in October 2020. A Finding of No Significant Impact (FONSI) was issued in March 2022 along with the Final EA report. The latest example of Massport ongoing efforts is the RNAV Study (completed in 2021), which was a joint effort between the FAA and Massport with the technical work by MIT. The study was a unique effort that included extensive community outreach, including the Massport CAC. The study assessed the impacts of the FAA's introduction of new, more precise flight procedures and made recommendations to reduce impacts. To date, two recommendations have been implemented and two more are under FAA review. See Chapter 6, *Noise Abatement* Section titled *FAA and Massport RNAV Pilot Project.*
A-42	Kathleen Theoharides, Secretary	Air Quality	The 2020/2021 EDR should continue to provide an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling.	Chapter 7, *Air Quality/Emissions Reduction,* provides updated information regarding recent and ongoing scientific studies associated with airport emissions including the *Logan Airport Health Study* by Massachusetts Department of Health (2014), *Impacts of Aviation Emissions on Near-Airport Residential Air Quality* by Tufts University (2020), and similar airport-related health studies by the University of Southern California and University of Washington. Logan Airport is in the Boston Metropolitan Area. In accordance with the Clean Air Act (CAA), all areas within Massachusetts are designated as either attainment, nonattainment, or attainment/maintenance with respect to the NAAQS. The regulatory designations for the Boston Metropolitan Area as of the publication of this EDR are listed in Table 7-2 of Chapter 7, *Air Quality/Emissions Reduction* . As shown, the area is designated to be in attainment of all pollutants, except for carbon monoxide (CO), which it is designated to be in attainment/maintenance. The AEDT noise and air quality model was released in 2015 and is FAA's approved computer model for calculating emissions from aircraft-related sources. As discussed in Chapter 7, *Air Quality/Emissions Reduction* , Section *Assessment Methodology* , the AEDT model was developed to incorporate the most up-to-date and best-available science. The latest version of AEDT at the time of the *2020/2021 EDR* emission estimates was AEDT 3d, which was released in March of 2021. AEDT 3d introduced new features, improvements, and updates from the previous model version 3c re-release used in the *2018/2019 EDR* . Consistent with prior EDRs and ESPRs, the 2020 and 2021 GHG assessment followed the guidance issued by the Transportation Research Board's (TRB) Airport Cooperative Research Program (ACRP) Report 11: Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories. Additionally, the 2020 and 2021 GHG emissions were assessed following the guidance of the Airports Council International (ACI) Airport Carbon Accreditation (ACA) Program.

Comment #	Author	Topic	Comment	Response
A-43	Kathleen Theoharides, Secretary	Air Quality	The 2020/2021 EDR should also provide discussion of progress on national and international levels to decrease air emissions.	Chapter 7, *Air Quality/Emissions Reduction,* describes advancements on the national and international levels to decrease airport-related air emissions and have continued to focus primarily on three initiatives: the advanced quantification of particulate matter (PM) and hazardous air pollutants (HAPs) emissions from aircraft engines; the continued phasing-in of alternative fuel vehicles (AFVs); and the implementation of GHG emissions reduction strategies.
A-44	Kathleen Theoharides, Secretary	Air Quality	Massport should continue to use the latest version of FAA's AEDT model for air emissions modeling as was presented in the 2018/2019 EDR. The EPA Motor Vehicle Emission Simulator (MOVES) tool should continue to be used to assess vehicular emissions on airport roadways. The 2020/2021 EDR should include a mobile sources emissions inventory for CO, NOx, VOCs, and PMs.	Chapter 7, *Air Quality/Emissions Reduction,* includes mobile sources emissions inventory for the requested pollutants. The FAA's AEDT model and EPA Motor Vehicle Emission Simulator (MOVES) tool continues to be the precedent for Massport's assessment of vehicular emissions on Airport roadways.
A-45	Kathleen Theoharides, Secretary	Air Quality	It should also report on Massport and tenant alternative fuel vehicle programs and the status of Logan Airport air quality studies undertaken by Massport or others, as available.	Chapter 7, *Air Quality/Emissions Reduction* describes Massport's AFV Program, which is designed to replace Massport's conventionally-fueled fleet with alternatively fueled or powered vehicles, when feasible, to help reduce emissions associated with Logan Airport operations.
A-46	Kathleen Theoharides, Secretary	Ground Access/Growth	The 2020/2021 EDR should demonstrate that Massport's programs to maintain and increase HOV modes provide the capacity to meet demand associated with growth.	Chapter 5, *Ground Access to and from Logan Airport* , describes how Massport's programs maintain and plan to increase HOV modes to support changes in demand.
A-47	Kathleen Theoharides, Secretary	Air Quality/Public Health	For the first time, the 2018/2019 EDR includes information about research into the health impacts of aviation. I appreciate Massport including this information and expect that the 2020/2021 EDR will include an update on it. The 2020/2021 EDR should also provide an update on the status and the findings of UFP research being performed by Tufts University and Boston University regarding the identification of airport-specific related UFPs in an urban environment.	Chapter 7, *Air Quality/Emissions Reduction* provides updated information regarding recent and ongoing scientific studies associated with airport emissions including the UFP research, *Impacts of Aviation Emissions on Near-Airport Residential Air Quality* by Tufts University (2020). The research continues including monitoring around Logan Airport by Boston University and Tufts University under the FAA's Center of Excellence for Alternative Jet Fuels and Environment, Aviation Sustainability Center (ASCENT).
A-48	Kathleen Theoharides, Secretary	Public Health	The 2020/2021 EDR should present more direct information about the major research findings around health and airport impacts in relation to emissions, including likely pollution and noise health impacts, and commitments from Massport for the reduction and mitigation of these impacts.	Massport continues to present information on research findings on public health, including noise and air emissions. Refer to Chapters 6, *Noise Abatement* and Chapter 7, *Air Quality/Emissions Reduction,* which present summaries and links to recent study findings related to airport noise and air quality impacts on public health. Massport will continue to advance strategies for reducing overall Logan Airport-related impacts.

Comment #	Author	Topic	Comment	Response
A-49	Kathleen Theoharides, Secretary	Public Health/Air Quality	Since October 2014, as a result of the Department of Public Health's (DPH) Logan Airport Health Study, Massport has provided funding for the East Boston Neighborhood Health Center (EBNHC) to enhance services and educational resources for children and adults in East Boston and Winthrop who are managing asthma and/or Chronic Obstructive Pulmonary Disease (COPD). Massport should continue to fund this program and should consult with the EBNHC to evaluate opportunities to expand current services, outreach, and prevention materials. This expanded effort should include collaboration with East Boston and Winthrop public school nurse coordinators to identify additional high risk individuals in schools and ways to expand outreach efforts. The 2020/2021 EDR should include an update on the status of this collaboration effort. Massport indicates that they contacted the EBNHC in early January 2020 regarding supplementing the Massport-funded Asthma Home Visiting program with HEPA filters; however this was not identified as the best strategy for this program. The 2020/2021 EDR should describe how Massport will reengage with the Health Center and include a discussion of how the services provided directly to and through the Health Center (which are funded by Massport) can be expanded. I encourage Massport to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts.	Chapter 7, *Air Quality/Emissions Reduction* provides updated information regarding recent and ongoing scientific studies associated with airport emissions including the *Logan Airport Health Study* by Massachusetts Department of Health (2014), *Impacts of Aviation Emissions on Near-Airport Residential Air Quality* by Tufts University (2020), and similar airport-related health studies by the University of Southern California and University of Washington. The findings show key differences exist in the particle size distribution and the black carbon concentration for roadway and aircraft features. Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. This includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, and aircraft towing requirements. Massport has also begun a program to electrify, where possible, airfield GSE. Massport continues to work with FAA, research institutions like MIT, Boston University, and Tufts University to look for ways to reduce impacts and expand research including on UFP. Chapter 7, *Air Quality/Emissions Reduction*, provides an update on its ongoing collaboration and evolving service strategy with the Massachusetts DPH and East Boston Neighborhood Health Center. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and COPD Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
A-50	Kathleen Theoharides, Secretary	Water Quality	The 2020/2021 EDR should identify any planned stormwater management improvements and report on the status of: • NPDES Permit and monitoring results for Logan outfalls and the Fire Training Facility; • Jet fuel usage and spills; • MCP activities; • Tank management; • Update on the environmental management plan; and • Fuel spill prevention.	Chapter 8, *Environmental Compliance and Management/Water Quality* reports on the required items as noted. The most recent update to the Stormwater Pollution Prevention Plan (SWPPP), which is part of the National Pollutant Discharge Elimination System (NPDES) permit, was completed in December 2021 and distributed to Massport and its stormwater co-permittees at its annual update meeting. The Logan Airport SWPPP addresses stormwater pollutants including deicing and anti-icing chemicals, bacteria, fuel and oil, and other sources of stormwater pollutants. Best management practices (BMPs) specific to aviation activities are included in the SWPPP. In accordance with the other requirements of the NPDES permit, Massport conducts training for personnel responsible for implementing activities identified in the SWPPP. The 2020 and 2021 Annual Certificates of Compliance were submitted jointly to the EPA and Massachusetts Department of Environmental Protection (MassDEP) in December 2020 and December 2021, respectively, by Massport and the co-permittees.

Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the *Logan Airport 2017 Environmental Status and Planning Report (ESPR)*

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Kathleen A. Theoharides
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/eea

November 25, 2019

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
2017 LOGAN AIRPORT ENVIRONMENTAL STATUS AND PLANNING REPORT

PROJECT NAME	: 2017 Environmental Status and Planning Report (ESPR)
PROJECT MUNICIPALITY	: Boston/Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: August 7, 2019

As Secretary of the Executive Office of Energy and Environmental Affairs (EEA), I hereby determine that the Status and Planning Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA) (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

The environmental review process for Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of the Massachusetts Port Authority's (Massport) long-range planning process. The ESPR provides a "big picture" analysis of the environmental impacts associated with current and projected activity levels, and presents a comprehensive strategy to minimize impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific Environmental Impact Reports (EIRs). The ESPR is generally updated on a five-year basis. The

previous ESPR for the year 2011 was filed in April of 2013. Environmental Data Reports (EDRs) are filed in the years between ESPRs. The EDR is a retrospective document that is filed annually and identifies environmental impacts based on actual passenger activity and operations. The 2017 ESPR is the subject of this review. This 2017 ESPR follows the 2016 EDR and reports on 2017 and future conditions. In addition, Massport has requested to combine both the 2018 EDR and the 2019 EDR into one document referred to as the 2018/2019 EDR. I have considered and granted this request. This Certificate also contains a Scope for the 2018/2019 EDR. A-1

I have received comments from elected officials and municipalities including State Representative Adrian Madaro, State Senator Walter Timilty, State Representative RoseLee Vincent, Boston City Councilor Lydia Edwards, the Town of Winthrop's Board of Health, and the Selectboard of the Town of Milton. Comments were also submitted by municipalities, environmental advocacy groups, community organizations, and residents. The 2017 ESPR acknowledges that passenger activity has continued to grow faster than forecasts provided in the 2016 EDR and the previous 2011 ESPR. The majority of comment letters note that actual passenger growth has outpaced previous projections and identify concerns that measures to mitigate resulting noise, air quality, and transportation impacts have not been provided commensurate with the increased growth. Comments also identify concerns that the projected passenger growth rate underrepresents future conditions and associated impacts. Comments from State Representative Adrian Madaro, State Representative RoseLee Vincent, the Conservation Law Foundation (CLF), Airport Impact Relief Incorporated (AIR Inc.), the Town of Milton, and others request that Massport develop and analyze a higher passenger and aircraft growth scenario based upon actual growth rates. Comments also request that Massport present more direct information about the major research findings around health and airport impacts, including likely pollution and noise health impacts, and commitments from Massport for the reduction of and mitigation of these impacts. A-2 A-3

In addition to responding to these comments, the 2018/2019 EDR should report on the progress and other refinements for tracking noise, traffic, and air emissions and abatement efforts, as further described in the Scope below. The 2018/2019 EDR will document potential impacts and trends and propose measures to avoid, minimize and mitigate environmental impacts. Should actual growth in passenger and/or aircraft operations outpace the forecasts, I expect that additional information will be provided in future EDRs. Specifically, the EDR(s) should explain the circumstances that caused the growth, describe how this may affect the impact forecasts, and identify mitigation and policy strategies that will be implemented to address the proportional growth in impacts. Furthermore, I reserve the right to require that future ESPRs evaluate the impacts of a range of activity forecasts, based on the results of the interim reporting provided in the EDRs. A-4 A-5

Logan Airport Environmental Review and Planning

The ESPR is generally responsive to the Scope. It contains useful data on activity levels and impacts, and lays out a forecast for trends in the future years. The technical studies in the 2017 ESPR include reporting on, and analysis of, key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management,

and project mitigation tracking. This 2017 ESPR focuses on: (1) rapidly growing domestic and international passenger demand; (2) the formal introduction of transportation network companies (TNC), such as Uber and Lyft, to Logan Airport and subsequent effects; (3) airport-wide emissions including those associated with vehicle trips; (4) use of the Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) for noise and air quality modeling; and, (5) noise abatement strategies.

In 2017, passenger activity at Logan Airport continued to grow faster than previous forecasts. Air passenger activity levels at Logan Airport reached an all-time high of 38.4 million in 2017, an increase of 5.9 percent over what was projected in the 2016 EDR. Aircraft operations increased to a total of 401,371 in 2017, an increase of 2.6 percent over 2016. This trend continued in 2018 with air passenger activity levels of 40.9 million and aircraft operations totaling 424,024. The growth is directly correlated to the strong national and regional economies and an increase in demand for international air service. Massport has responded to this demand for international air by providing new service to international destinations and expanding service to existing destinations. As passenger levels have increased, aircraft operations remain significantly below the peak of 507,449 operations experienced in 1998 when Logan Airport served 26.5 million passengers. The reduction of over 100,000 annual flight operations, combined with the transition towards newer and larger aircraft with improved environmental performance and operational efficiencies, have supported passenger growth while limiting environmental impacts.

Although environmental impacts are significantly lower compared to 1998 when operations were highest, comparison of activity level and environmental impact data to the 2016 EDR identifies incremental increases in noise exposure, air emissions and traffic. These increases were not forecast in the previous 2011 ESPR. The current passenger forecast is higher by approximately 10 million passengers, or 26 percent higher, than the previous 2011 ESPR planning forecast of 39.8 million passengers. The 2017 ESPR forecast for aircraft operations (486,364) is approximately 2.5 percent higher than the 2011 ESPR operations forecast (474,734). These increases are associated with passenger growth, changes in flight patterns, and changes in modeling of noise and air quality. The 2017 ESPR indicates that terminals, roadways, and parking facilities are strained by these increases and identifies on-Airport improvements to relieve on-Airport roadway congestion and accessibility.

Logan Airport passenger ground access is changing rapidly with the use of TNCs for departures and arrivals at the Airport. Massport began collecting TNC data in 2017 when TNCs were authorized to pick up customers from the airport. The 2017 ESPR provides data and identifies effects of TNCs and provides an assessment of ground access trends.

The most significant change since the previous 2011 ESPR is the introduction by the FAA of changes to area navigation (RNAV) procedures. The RNAV program has been implemented throughout the country and its primary purpose is to increase safety and operational efficiency. The implementation of several of these procedures has resulted in concentrations of flight patterns over certain communities and significant increases in noise exposure. The impact of the RNAV program is emphasized in comment letters received on the 2017 ESPR and during review of specific projects, including the Terminal E Modernization Project (EEA# 15434).

Massport and the FAA signed a Memorandum of Understanding (MOU) in 2017 to frame a new process for analyzing opportunities to incrementally reduce noise through changes or amendments to Performance Based Navigation (PBN), including RNAV procedures. The 2017 ESPR provided an update on this process and described Massport's efforts to mitigate noise exposure and impacts.

The 2017 ESPR provides information on noise conditions modeled using the latest FAA noise modeling software, the Aviation Environmental Design Tool (AEDT). Massport transitioned to AEDT from the Integrated Noise Model (INM) in its 2016 EDR. The 2017 ESPR also uses FAA's AEDT model for emission factors compared to the legacy Emissions and Dispersion Modeling System (EDMS) model. Massport attributes some of the changes in air emissions to the use of the AEDT model, which assumes higher nitrogen oxides emission factors compared to the legacy EDMS model.

Review of the 2017 ESPR and Scope for the 2018/2019 EDR

The 2017 ESPR identifies the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts; analyzes trends and environmental impacts of operations in calendar year 2017 and provides projections for the next 10 to 15 years; and provides updates on projects, environmental management plans, and the status of project mitigation.

The 2018/2019 EDR must include information on the environmental policies and planning that form the context of environmental reporting, technical studies, and environmental mitigation initiatives against which projects at Logan Airport can be evaluated. This should include identification of the cumulative effects of Logan Airport operations and activities. The results of the Logan Airport Air Passenger Ground Access Survey and the Long-term Parking Management Plan should inform transportation planning and strategies to achieve the high occupancy vehicle (HOV) mode share goal. A-6

The 2018/2019 EDR must include copies of all ESPR and EDR Certificates and a distribution list (indicating those receiving documents, CDs, or Notices of Availability). Supporting technical appendices should be provided as necessary. A-7

Response to Comments

The Response to Comments section should address all of the substantive comments on the 2017 ESPR, and other Certificates for Logan Airport that reference EDR/ESPR documentation (e.g. Logan Airport Parking Project, Terminal E). To ensure that the issues raised by commenters are addressed, the 2018/2019 EDR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the EDR beyond what has been expressly identified in this Certificate. The Responses to Comments should not reference a section of the EDR unless they are directly responsive to the comment. Common themes that should be addressed A-8

throughout the EDR and in the Responses to Comments include noise (modeling of noise contours and noise abatement) and emissions reduction issues. The EDR should include sufficient information to address comments on traffic, air quality, and public health, which are common concerns of commenters.

A-8

Activity Levels

Air traffic activity levels at Logan Airport are the basis for the evaluation of noise, air quality, and ground access conditions associated with the Airport. In this section, current activity levels at the Airport are compared to prior-year levels, and historical passenger and operations trends at Logan Airport dating back to 2000 which is the year Massport approved an Environmental Management Policy. The total number of aircraft operations at Logan Airport increased for a total of 401,371 in 2017, an increase of 2.6 percent over 2016. Aircraft operations remain well below the 487,996 operations in 2000 and the historic peak of 507,449 operations reached in 1998. The slower growth in aircraft operations compared to passenger levels is due to the steady increase in aircraft size and improving aircraft load factors (passengers/available seats). Air carrier efficiency continued to improve in 2017 as the average number of passengers per aircraft operation at Logan Airport grew from 92.8 in 2016 to 95.7 in 2017. The increasing number of passengers per flight reflects a shift away from smaller aircraft and rising load factors as airlines continue to focus on capacity control and improvements in efficiency. This trend is indicative of the industry-wide shift toward higher aircraft load factors and an increase in the number of domestic and international destinations.

Logan Airport is considered an origin and destination airport both nationally and internationally, meaning that approximately 90 percent of Logan Airport passengers either start or end their trip in the New England area. According to the 2017 ESPR, international passenger levels increased at a faster rate than domestic passenger levels in 2017. Domestic air passenger activity levels increased by 5.1 percent while international air passenger activity levels increased by 9.3 percent over 2016 levels. The 2017 ESPR indicates that strong international passenger growth was driven by the economic attractiveness of the metropolitan Boston region and the strength of Boston as an origin and destination market. In response to regional demand for international service, new non-stop services were introduced by a number of airlines including Air Berlin, Norwegian Air Shuttle, Qatar Airways, Scandinavian Airlines, and TAP Air Portugal. New international destinations from Logan Airport in 2016 included Dusseldorf, London Gatwick, Doha, Copenhagen, and Lisbon.

The 2017 ESPR also updates the Logan Airport long-term passenger forecast to reflect growth trends at Logan Airport and revised expectations for the local/national/international economy. It addresses methodologies and assumptions used in the analysis, including anticipated changes to fleet mix and other trends in the aviation industry.

Passenger activity has continued to grow faster than forecasts provided in the 2016 EDR and the previous 2011 ESPR. In 2017, air passenger activity levels at Logan Airport reached 38.4 million, an increase of 5.9 percent over 2016. The 2017 passenger level represents a record high for Logan Airport. The ESPR projects that Logan Airport will reach 50 million annual passengers in the next 10 to 15 years (the Future Planning Horizon). This 2017 ESPR evaluates

future operational and environmental conditions associated with this increase in passenger activity. This level of air passengers is forecast to be accommodated in approximately 486,000 annual aircraft operations. The 2017 ESPR indicates that the analysis provided for Massport's forecast is consistent with the FAA's Terminal Area Forecast (TAF) that states within the 10- to 15-year planning horizon, the FAA forecasts 50 million annual air passengers at Logan Airport.

The 2017 ESPR provides a description on how Massport will achieve long-standing goals to reduce overall operating and environmental impacts at the airport as passengers and, in particular, international passengers increase. With this growth comes challenges, and Massport has to develop strategies to address these challenges in a manner that will allow Logan Airport to evolve in a sustainable and environmentally-responsible way. If this passenger level is reached sooner, Massport needs to ensure mitigation is being provided commensurate with increased growth and associated impacts. Passenger activity reached an all-time high in 2017 and the ESPR indicated this growth continued into 2018, with 40.9 million air passengers. According to the ESPR, this peak follows unprecedented, consistent growth since 2013 at a 6.2 percent annual average growth, making Logan Airport one of the fastest growing airports in the US in terms of passenger activity levels. The projection of 50 million annual air passengers in the next 10 to 15 years represents an average annual growth rate of 1.5 percent. While I understand that growth at Logan Airport can be attributed to the strong local, regional, and national economies, many comments identify concerns that Massport may reach 50 million annual passengers much sooner than the projected 10 to 15 year timeframe. I expect that additional information will be provided in future EDRs if actual growth in passenger and/or aircraft operations outpace the forecasts, including a discussion of passenger and activity levels and planning/mitigation to address impacts of the growth. I reserve the right to require that future ESPRs evaluate a range of activity forecasts based on the results of this interim reporting. I also expect that air and noise emissions related to passenger and activity levels and planning/mitigation will be a significant emphasis of the 2018/2019 EDR.

A-9

To improve accessibility to the Airport as well as to relieve on-Airport roadway congestion, Massport proposes to enhance HOV and Logan Express facilities, implement on-Airport roadway and Massachusetts Bay Transportation Authority (MBTA) Blue Line/intra-terminal connectivity projects, construct a consolidated transportation network company (TNC, such as Uber and Lyft) drop-off and pick-up area, and construct new parking facilities, which will help reduce the number of drop-off/pick-up trips. The 2018/2019 EDR should report on the effectiveness of the TNC management plan and provide an update on planned and executed measures to relieve on-Airport roadway congestion.

A-10

The 2018/2019 EDR should also report on:

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Domestic and international passenger activity levels;
- Cargo and mail volumes;
- Comparison of 2018/2019 operations and passenger activity levels to 2017 activity levels; and
- National aviation trends compared to Logan Airport trends.

Sustainability at Logan Airport

The 2017 ESPR describes Massport's airport wide sustainability goals as identified in its International Organization for Standardization (ISO) 14001 Environmental Management System (EMS) and Sustainability Management Plan (SMP). In 2015, Massport completed the Logan Airport SMP through a grant awarded by the FAA. The SMP is integrated with the existing EMS framework to promote environmental, social, and economic improvement. The SMP identifies efforts to promote, coordinate, and integrate sustainability initiatives Airport-wide. Progress towards achieving these goals is addressed in the 2017 ESPR. The 2017 ESPR also describes the Annual Sustainability and Resiliency Report, released in April 2018. The report highlights achievements and progress toward Massport's sustainability goals and targets since the release of the SMP in 2015 and the publication of the Annual Sustainability Report in 2016. Massport has achieved three sustainability targets for energy use per square foot, energy use per passenger, and greenhouse gas (GHG) emissions per passenger. The 2018/2019 EDR should provide updates to airport wide sustainability goals. A-11

Climate Change

Massport assets and Logan Airport, in particular, are critical infrastructure and play an important role in the economy. As recognized in Governor Baker's recent Executive Order (EO) 569 "Establishing an Integrated Climate Change Strategy for the Commonwealth" and a suite of other state and municipal initiatives, the impacts of climate change must be an important consideration for development across the state. Climate change presents a serious threat to the environment and the Commonwealth's residents, communities, and economy. The EO indicates that extreme weather events associated with climate change present a serious threat to public safety and the lives and property of our residences.

The EO also identifies the transportation sector as a significant contributor to GHG emissions in the Commonwealth and the only sector in which GHG emissions are increasing. In 2017, EEA and the Massachusetts Department of Transportation (MassDOT) conducted a number of transportation listening sessions throughout the Commonwealth to inform development of strategies and programs to reverse the growth in this sector. The 2017 ESPR addresses Massport's consistency with EO 569, the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, and the Massachusetts Energy Plan.

GHG emissions

The 2017 ESPR incorporates GHG emissions reporting consistent with that provided in the 2016 EDR which was normalized to support effective review and analysis. The 2017 ESPR includes only conditioned (heated and cooled, enclosed buildings) building areas in energy use and emission intensity calculations, reports input energy components (oil, gas, electricity) and central plant data, and clarifies how renewables are accounted for in the analysis. The 2017 ESPR contains a GHG emissions inventory for the Logan Airport which presented emissions and energy data normalized by passenger use and building area. The GHG emissions associated with buildings and transportation were presented as pounds of carbon dioxide (CO_2) per passenger.

Energy use for buildings were presented as Kilo British Thermal Units (kBtu) per square foot (sf) per year. The analysis showed that Massport has reduced emissions per passenger across its operations by 39 percent from 2007 to 2017. Building energy use has been reduced 23 percent while building emissions have been reduced 44 percent from 2007 to 2017.

The 2017 ESPR quantifies GHG emissions for aircraft, ground support equipment (GSE), motor vehicles, and stationary sources using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (Airport Cooperative Research Program (ACRP) Report 11, Project 02-06). The 2017 ESPR compares the results of the 2017 GHG emissions inventory to the 2016 EDR results. Total GHG emissions increased from 2016 to 2017 by about 8 percent due primarily to the increase in aircraft operations. Total emissions of GHG in the Future Planning Horizon are predicted to be about 23 percent higher than 2017 levels predominantly due to the predicted increase in aircraft operations. Specifically, this is attributable to the forecasted approximate 21 percent increase in aircraft operations and 31 percent increase in passenger traffic, each resulting in an increase in fuel usage and vehicle miles traveled (VMT). The Future Planning Horizon Massport-related emissions are expected to represent about 10 percent of total GHG emissions at the Airport. Tenant-based emissions are anticipated to represent about 71 percent; electrical consumption from Massport, common areas, and tenants are anticipated to represent about 7 percent; and passenger vehicle emissions are anticipated to represent about 12 percent of total GHG emissions.

The 2018/2019 EDR should incorporate GHG emissions reporting consistent with that provided in the 2017 ESPR which was normalized to support effective review and analysis. In addition, Massport should ensure that only conditioned (heated and cooled, enclosed buildings) building areas are included in energy use and emission intensity calculations, report input energy components (oil, gas, electricity) and central plant data, and clarify how renewables are accounted in the analysis. I encourage Massport to consider the recommendations identified in comments from the Department of Energy Resources (DOER) which recommend electrification of space and water heating as well as evaluation of opportunities for distributed renewable energy generation. Massport should consult with the MEPA Office and the DOER regarding presentation of GHG data in the 2018/2019 EDR. A-12

The 2018/2019 EDR GHG emissions should continue to be quantified for aircraft, GSE, motor vehicles, and stationary sources using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* as developed for the 2017 ESPR. The results of the 2018/2019 GHG emissions inventory should be compared to the 2017 results. A-13

Adaptation and Resiliency

The 2017 ESPR details the resiliency program developed by Massport to identify critical infrastructure and to enhance its resiliency. As reported in the Logan Airport 2018 Annual Sustainability and Resiliency Report included in the 2017 ESPR, approximately 60 percent of

critical assets (electrical power, diesel fuel pumping stations, telecommunications systems, and public safety) have been protected from storm surge flooding via relocation, and/or raising in elevation, exceeding the 2020 resiliency target of 25 percent. A particular concern for Massport is the effect of sea level rise and projected increases in the severity and frequency of storms. At the end of 2013, in recognition of the potential effects of climate change on Massport infrastructure and operations, Massport initiated a Disaster and Infrastructure Resiliency Planning (DIRP) Study for Logan Airport. The DIRP Study includes a hazard analysis, modeling sea-level rise and storm surge, and projections of temperature, precipitation, and anticipated increases in extreme weather events. The DIRP Study provides recommendations regarding short-term strategies to make Massport's facilities more resilient to the effects of climate change. In addition to the DIRP Study and its related initiatives, Massport has completed an Authority-wide risk assessment; issued a Floodproofing Design Guide (which was updated in April 2016); and developed a resilience framework to provide consistent metrics for short- and long-term planning and protection of its critical facilities and infrastructure. The 2017 ESPR provides a summary of the DIRP Study and identifies which recommendations Massport will implement in the short term and long term. The 2018/2019 EDR should continue to identify which recommendations will be implemented by Massport to improve resiliency. A-14

The effects of climate change, such as extreme heat, may exacerbate the negative health effects of air pollution. As the effects of climate change progress, I encourage Massport to consider its ability to reduce negative air quality effects as a matter of public health, and to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. As discussed below in greater detail, the 2018/2019 EDR should report on findings around health and airport impacts in relation to emissions, as well as measures to reduce these impacts. A-15

Mitigation

The 2017 ESPR provides an update on Massport's mitigation commitments under the MEPA for projects at Logan Airport for which an Environmental Impact Report (EIR) was filed and state Section 61 Findings were committed in order to document that all feasible measures have been taken to avoid or minimize impacts. The 2017 ESPR addresses cumulative, Airport-wide impacts. The 2017 ESPR also updates the status of mitigation commitments for recent projects such as the Terminal E Modernization Project and the Logan Airport Parking Project as well as projects previously included in the EDRs.

The 2018/2019 EDR should continue to report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review. It should update the status of Massport's mitigation commitments and also identify projects for which mitigation is complete. A-16

Planning

The Airport Planning section describes the status of projects underway or completed at Logan Airport by the end of 2017. Specific topics include terminal area projects, service area projects, buffer/open space projects, Airport parking projects, airside area projects, HOV improvements, and Airport-wide projects. Project updates include:

- *Terminal E Renovation and Enhancements Project*: This project includes interior and exterior improvements at Terminal E to accommodate regular service by wider and longer Group VI aircraft. The project reconfigured three gates to accommodate Group VI aircraft (including the Airbus A380 and Boeing 747-8 primarily used by international air carriers) and passenger holdrooms to accommodate larger passenger loads associated with these aircraft. Construction was completed in early 2017.

- *Terminal E Modernization Project*: This project will accommodate existing and long range forecasted demand for international service. The expansion will add the three gates approved in 1996 (International Gateway West Concourse project, EEA #9791), which were never constructed, and four additional new gates in an extended concourse. A key feature of this project is the first direct pedestrian connection from the MBTA Blue Line Airport Station to the terminal complex at Logan Airport. It will also include roadway improvements to facilitate access to the terminal.

- *Terminal C to E Airside Connector:* This project provides a new post-security connection between Terminals C and E on the Departures Level and provides improved passenger circulation within the post-security concourses, additional holdroom space at Terminal E, reconfigured office space, concessions and concessions support, and a new consolidated location for escalators and stairs. The project was completed in May 2016.

- *Terminal B Airline Optimization Project:* Massport is upgrading its facilities on the Pier B side of Terminal B to meet airlines' needs (primarily reflecting the merger of American Airlines and US Airways) and to provide facilities that improve the passenger traveling experience. Similar improvements have been implemented with the recent renovations and improvements at Terminal B, Pier A. Planned improvements include an enlarged ticketing hall; improved outbound bag area; and expanded bag claim hall, concession areas, and holdroom capacity at the gate. Final design is complete and construction is underway. Construction was completed in 2019.

- Massport is also planning improvements to Terminal A, including interior upgrades in the main terminal and satellite terminal, enhanced passenger amenities, reconfiguration and improvements at the security checkpoint, and a feasibility study of post-security connection between Terminal A and Terminal B, and Terminal A and Terminal E.

- *Logan Airport Parking Project*: This project includes the construction of up to 5,000 new commercial parking spaces to reduce trip generation associated with increases in passenger drop-off and pick-up at the airport. The Certificate on the Draft Environmental Impact Report (DEIR) was issued on August 2, 2019 and included a Scope for the Final Environmental Impact Report (FEIR). The project required an amendment to the Logan Airport Parking Freeze Regulations (310 CMR 7.30). Amendments to the regulations were promulgated in 2017. During the review of the 2017 ESPR Massport released three studies to identify ways to further support alternative transit options to and from the Airport, which the amended Parking Freeze regulations required Massport to complete. The results of these studies will inform Massport's future long-range planning efforts to

reduce air passenger-related VMT and associated air emissions which will extend the associated air quality benefits of this project.

- In addition to the planned roadway improvements as part of the Terminal C Building, Roadway and Curb Enhancements, Terminal E Modernization, and Logan Airport Parking Projects, Massport is considering other possible infrastructure modifications. Several options are being considered to reduce on-Airport congestion and improve on-Airport ground access efficiency, including dedicated HOV bus lanes, the creation of an intermodal transportation center with bus service to terminals, and the construction of an Automated People Mover (APM).

- *Maintenance of Airport Edge Buffer Areas and Parks:* The 2017 ESPR provides updates on the planning, construction, and maintenance of four Airport edge buffer areas and two parks along Logan Airport's perimeter. As of 2017, the Bayswater Buffer, Navy Fuel Pier Buffer, SWSA Buffer Phase 1 and the SWSA Buffer Phase 2 have been completed. These buffers and parks include 3.3 miles and more than 33 acres of green space developed or managed by Massport.

The 2018/2019 EDR should continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport must accommodate and guide tenant development. The EDR should describe the status of planning initiatives for the following areas: A-17

- Roadways and Airport Parking;
- Terminal Area;
- Airside Area;
- Service and Cargo Areas;
- Airport Buffers and Landscaping; and,
- Energy, Sustainability, and Resiliency.

The 2018/2019 EDR should also indicate the status of long-range planning activities, including the status of public works projects implemented by other agencies within the boundaries of Logan Airport. The 2018/2019 EDR should identify the status and assess the effectiveness of ground access changes, including roadway and parking projects, that consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on streets in adjacent neighborhoods. A-18

Regional Transportation

The 2017 ESPR describes activity levels at New England's regional airports and provides an update on regional planning activities, including long-range transportation efforts. The New England region is anchored by Logan Airport and a system of 10 other commercial service, reliever, and general aviation (GA) airports (regional airports). In 2017, passenger traffic at the New England airports represented the highest passenger traffic level for the region since the economic downturn in 2008. In 2017, the total number of air passengers utilizing these 11 New

England commercial service airports increased by 5.5 percent, from 51.9 million air passengers in 2016 to 54.7 million passengers in 2017.

The 2018/2019 EDR should report on: A-19

Regional Airports

- 2018 and 2019 regional airport operations, passenger activity levels, and schedule data within an historical context;
- Status of plans and new improvements as provided by the regional airport authorities;
- Regional economic factors;
- Role of the Worcester Regional Airport and Hanscom Field in the regional aviation system and Massport's efforts to promote these airports; and
- Ground access improvements at Massachusetts Regional Airports.

Regional Transportation System

- Massport's role in managing the regional aviation facilities;
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership.

Ground Access to and from Logan Airport

The 2017 ESPR reports that average daily traffic and VMT on Airport roadways has increased in 2017 compared to 2016. The 2017 ESPR provides data on transit ridership, roadways, traffic volumes, and parking. Specifically, the ESPR states that Massport has continued to invest in and operate Logan Airport with a goal of increasing the number of passengers arriving by transit or other HOV modes. The 2017 ESPR provides a discussion of ground access modes and trip generation associated with each mode including: (1) transit and shared-ride HOV services; (2) drive to Logan Airport and park; or (3) drop-off/pick-up mode, which can involve a private vehicle, taxi, limousine, or TNCs.

Average weekday on-Airport VMT increased by about 11 percent from approximately 176,840 in 2016 to 196,500 in 2017. The change in average daily traffic can be attributed primarily to the increases in air passenger activity, passenger drop-off/pick-up, cargo, and non-aviation related Airport uses. Additionally, the use of mobile application ride-booking services, such as Uber and Lyft, are increasingly becoming a mode of choice for ground access at Logan Airport. TNCs were estimated to contribute about 15,000 vehicle trips per day. TNCs are impacting other access modes to the Airport and contributing to on-Airport congestion. Partially due to the emergence of TNCs, black car limousines and scheduled van ridership dropped by 40 percent from 2016 to 2017. Taxi dispatches declined 18 percent and MBTA Blue Line ridership decreased by 2 percent in 2017 compared to 2016. The 2017 ESPR does not present a quantifiable comparison between VMT values prior to 2011 because the previous model was limited to terminal access roads while the current VMT model includes a larger on-Airport study area. Massport has proposed to construct a consolidated TNC drop-off and pick-up area and implement a TNC management plan to encourage shared rides and reduce gateway congestion.

Massport remains in compliance with the Parking Freeze regulations which regulates the number of commercial and employee parking spaces allowed at Logan Airport. As required, Massport submits semi-annual filings to the Massachusetts Department of Environmental Protection (MassDEP) to demonstrate compliance with the Logan Airport Parking Freeze. The full reports for 2017 are included in the 2017 ESPR. As permitted (and encouraged) by the regulations, Massport has converted employee spaces to commercial spaces, within the overall limits. In 2017, the Logan Airport Parking Freeze was amended to allow for an increase of up to 5,000 on-Airport commercial parking spaces, which allows for the construction of additional parking to reduce drop-off/pick up modes and alleviate constrained on-Airport parking conditions. MassDEP issued the amended regulation on June 30, 2017, approving the requested Parking Freeze increase. On December 5, 2017, the U.S. Environmental Protection Agency (EPA) proposed a rule approving the revision of the Massachusetts SIP incorporating the amended Logan Airport Parking Freeze. The final rule was issued on March 6, 2018 and became effective on April 5, 2018.

The 2017 ESPR describes a multi-pronged trip reduction strategy to reduce the number of private vehicles that access Logan Airport and, in particular, the drop-off/pick-up modes. Measures implemented in 2017 by Massport to increase HOV use include a blend of initiatives related to pricing (incentives and disincentives), service availability, service quality, marketing, and traveler information. The 2017 ESPR introduced a new definition for HOV modes. In the 2016 EDR and previous documents, Massport identified all taxis and TNCs as non-HOV and all black car limousines as HOV. The 2017 ESPR will estimate HOV and non-HOV breakdowns for taxis, livery services, and TNCs based on whether there is more than one passenger. Consistent with the directive identified in the Certificate for the Logan Airport Parking Project, and through negotiations with the CLF, Massport has committed to a goal of 35.5 percent HOV by 2022 and 40 percent by 2027.

The Airport-wide Automated Traffic Monitoring System (ATMS) includes permanent traffic count stations at the Airport's gateway roadways. These stations provide data on annual average daily traffic (AADT), annual average weekday daily traffic (AWDT), and annual average weekend daily traffic (AWEDT). The AADT (entering and departing Logan Airport) increased by 4.1 percent between 2016 and 2017. The change in average daily traffic can be attributed to: an 5.9-percent increase in air passenger activity in 2017; the impact of TNCs, which generated approximately 15,000 vehicle trips per day; and an increase in drop-off/pick-up activity by private and commercial automobiles.

The 2017 ESPR describes improvements to support HOV access which include: Back Bay Logan Express service (since May 2014); free boarding of the MBTA Silver Line outbound (from Logan Airport); a 1,100-car parking garage at the Framingham Logan Express; reduced holiday travel parking rates at Logan Express facilities; increased parking rates on the Airport; and support for private coach bus and van operators. Logan Express passenger ridership from suburban park-and-ride locations increased by over 6 percent from 2016 to 2017 and overall service increased by about 1 percent. The 2017 identified a continued decrease in ridership to and from Back Bay Logan Express, which has been a noted trend since the MBTA's Government Center Station reopened.

In the next 10 to 15 years Logan Airport is anticipated to reach 50 million air passengers. While the 2017 ESPR above discusses strains placed on the Airport's roadway infrastructure at 2017 levels (38.4 million passengers) the 2018/2019 EDR is an opportunity to commit to further reducing congestion and associated emissions by increasing HOV ridership, reducing TNC deadheading activity (empty one-way trips), increasing on-Airport parking to reduce drop-off/pick-up, and expanding Logan Express service and facilities. The 2018/2019 EDR should provide an expanded mitigation package to address the transportation impacts associated with increased passenger activity should actual passenger growth outpace the forecasts. A-20

The 2018/2019 EDR should report on 2018 and 2019 ground access conditions at the airport and provide a comparison to 2017 for the following:

- Description of compliance with Logan Airport Parking Freeze;
- High-occupancy vehicle (HOV) ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express);
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport vehicle miles traveled (VMT);
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning and the connection to the Massachusetts Bay Transportation Authority (MBTA) Airport Station associated with the planned Terminal E Modernization;
- Project, anticipated MBTA ridership, and possible changes in HOV mode share; and
- Trends of transportation network companies (TNCs), such as Uber and Lyft, and their operations at Logan Airport.

A-21

The 2018/2019 EDR should address the following topics:

- Target HOV mode share and incentives;
- Impact of TNCs on Logan Airport landside operations and effectiveness of the TNC management plan;
- Update on parking conditions;
- Non-Airport through-traffic;
- Cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Silver Line, Water Transportation, and Logan Express;
- Report on efforts to increase capacity and use of Logan Express;
- Progress on enhancing water transportation to and from Logan Airport;
- Results and recommendations of the ground access study Long-term Parking Management Plan required by the Parking Freeze amendments; and
- Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.

A-22

Noise

The 2017 ESPR updated the status of the noise environment at Logan Airport in 2017, provided a projection of noise impacts for the Future Planning Horizon, and described Massport's efforts to mitigate noise exposure and impacts. As described below in greater detail, the implementation of the RNAV Pilot study being jointly undertaken by FAA and Massport has resulted in concentration of flight patterns over certain communities and significant increases in noise exposure. The effects of this program are identified as significant concerns in the majority of comment letters.

The 2017 ESPR provides noise modeling results from the AEDT. The model requires detailed operational data as inputs for noise calculations, including numbers of operations per day by aircraft type and by time of day, which runway is used for each arrival and for each departure, and flight track geometry for each track. The 2017 ESPR also presents summaries of the 2017 operational data used in the noise modeling, as well as the resultant annual Day-Night Average Sound Level (DNL) noise contours, a comparison of the modeled results with measured levels from the noise monitoring system, and estimates of the population residing within various increments of noise exposure in 2017.

Both FAA and the U.S. Department of Housing and Urban Development consider DNL exposure levels above 65 decibels (dB) to be incompatible with residential land use. Population exposed to DNL levels greater than or equal to DNL 65 dB noise levels increased by 483 people, from 7,450 in 2016 to 7,933 in 2017. Runway use changes from 2016 to 2017 were the largest factor influencing noise exposure in 2017. The one-month closure of Runway 4R-22L from May and June 2017 and its continued limited availability for arrivals into September 2017 are reflected in the noise contour changes presented in the 2017 ESPR. An additional factor influencing noise contour changes in 2017 was an increase in nighttime operations, from 55,499 in 2016 to 61,155 operations in 2017, an increase of 10.2 percent. The DNL 65 dB contour is projected to increase due to expected growth in operations in the next 10 to 15 year Future Planning Horizon projects. Therefore, the total number of people residing in the DNL 65 dB contour would also increase. The 2017 ESPR also provides the Future Planning Horizon DNL contours presented compared to 2017. The contours indicate that the total number of nighttime operations for the Future Horizon Planning forecast (an average nightly 167.75) will remain almost the same as in 2017, while the daytime operations are expected to grow from an average of 932 operations to 1,165 daily (25 percent increase). The 2017 ESPR states that the contours represent a conservative estimate of the future noise levels because Massport assumes the continued advancement in aircraft technology will result in quieter engines and actual lower noise levels in the future.

In 2017, noise complaints more than doubled. Massport received 59,343 noise complaints from 95 communities, a 56-percent increase from the 2016 total of 38,045 noise complaints from 83 communities. The increase in complaints continues to be primarily related to the FAA's RNAV departure procedures, which concentrate flight tracks along narrower corridors. All complaints have been forwarded to FAA. The 2017 ESPR also provides an update on the Memorandum of Understanding (MOU) between Massport and FAA to frame the process for analyzing opportunities to reduce noise through changes or amendments to Performance

Based Navigation (PBN), including RNAV. The 2017 ESPR also states that FAA and Massport are committing to: measure and model the benefits and impacts of changing some RNAV approaches; and, test and develop an implementation plan, which will include environmental analysis and community/public outreach.

The 2017 ESPR EDR identifies which noise abatement measures are being employed and reports on the status of the sound insulation program since 1990. To date, Massport has installed sound insulation in 5,467 residences, including 11,515 dwelling units, and 36 schools in East Boston, Roxbury, Dorchester, Winthrop, Revere, Chelsea, and South Boston. Eligibility for sound insulation must follow FAA guidelines which requires that the residence is located within the latest DNL 65 dB contour and interior noise levels within habitable rooms of noncompatible structures must be 45 dB or greater with the windows closed. The FAA will allow a residence to be treated under the sound insulation program one time; homes treated previously are not eligible for additional consideration.

The 2018/2019 EDR must provide strategies to address noise impacts which are expressed in numerous comments received on the 2017 ESPR. Massport should continue to implement and develop additional noise abatement measures, such as runway use restrictions and reduced-engine taxiing. Massport should also coordinate with stakeholders through the Massport Community Advisory Committee to identify opportunities to reduce noise. A-23

The 2018/2019 EDR should also provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2018 and 2019 conditions and provide a comparison to 2017 for the following:

- Fleet Mix, including Stage II, Recertified Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft;
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals);
- Preferential runway advisory system (PRAS) tracking; and
- Flight tracks.

A-24

The 2018/2019 EDR should report on the following:

- Changes in annual noise contours and noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed;
- Cumulative Noise Index (CNI);
- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and
- Flight track monitoring noise reports.

A-25

The 2018/2019 EDR should also report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) study, and provide an update on the noise and operations A-26

monitoring system. It should also report on the status of Block 1 and 2 of the RNAV Pilot Project, which will analyze the feasibility of changes to some of RNAV approaches and departures from Logan Airport. A-26

Air Quality/Emissions Reduction

The 2017 ESPR provided an overview of airport-related air quality issues in 2017, efforts to reduce emissions, and projections for Future Planning Horizon emissions. The air quality modeling is based on aircraft operations, fleet mix characteristics, and airfield taxiing times combined with GSE usage, motor vehicle traffic volumes, and stationary source utilization rates. The 2017 ESPR uses FAA's approved computer model for calculating emissions from aircraft-related sources AEDT model. The latest version of AEDT is 2d (AEDT 2d), which was released in February 2018. Total air quality emissions from all sources associated with Logan Airport are significantly lower than a decade ago. The 2017 ESPR identifies Massport's initiatives to improve air quality and reduce emissions, including: replacement of gas- and diesel-powered GSE with all-electric GSE (eGSE) by the end of 2027 (as commercially available); implementation of additional initiatives to increase HOV use, continue to reduce emissions from Massport fleet vehicles, and encourage use of alternative fuel vehicles; and implementation of energy efficiency projects, including upgrades to the Central Heating and Cooling Plant, and increasing the use of renewable energy, such as solar and wind installations.

Aircraft emissions continue to represent the largest source (94 percent) of nitrogen oxides (NOx) at Logan Airport. In 2017, total emissions of NOx increased by about 12 percent from 2016 to 2017. Modeled NOx emissions increased to 5,935 kg/day compared to 5,300 kg/day in 2016. The increase in NOx from 2016 to 2017 is almost entirely attributed to the forecasted increase in aircraft operations at the Airport coupled with the changing aircraft fleet (i.e., greater use of quieter, more fuel-efficient aircraft engines that overall result in fewer emissions with the exception of NOx) . Emissions of NOx are predicted to increase by about 37 percent in the Future Planning Horizon compared to 2017. The changes are also attributable to the FAA's AEDT model, which assumes higher NOx emission factors compared to the legacy Emissions and Dispersion Modeling System (EDMS) model. NOx emissions associated with GSE, motor vehicles, and stationary sources, many of which Massport has control or influence, have declined from 2016 to 2017. As stated previously in this Certificate, GHG emissions also increased from 2016 to 2017 by about 8 percent due primarily to the increase in aircraft operations. Total emissions of GHG in the Future Planning Horizon are predicted to be about 23 percent higher than 2017 levels predominantly due to the predicted increase in aircraft operations.

Total modeled emissions of carbon monoxide (CO), particulate matter (PM10/PM2.5), and volatile organic compounds (VOCs) have decreased from 2016 to 2017 by about 4 percent, 20 percent, and less than 1 percent, respectively, even though aircraft operations have increased over the same time period. Specifically, total modeled emissions of VOCs decreased in 2017 to 1,273 kilograms (kg)/day, compared to 1,280 kg/day in 2016. Total modeled CO emissions decreased in 2017 to 7,092 compared to 7,350 kg/day in 2016. Total PM10/PM2.5 emissions have decreased to 77 kg/day in 2017 compared to 96 kg/day in 2016. The 2017 ESPR projects that total emissions of CO, PM10/PM2.5, and VOCs will decrease in the Future Planning Horizon by about 2 percent, 10 percent, and 8 percent, respectively, compared to 2017 levels.

The projected reduction in emissions is attributed to a combination of the conversion of GSE to viable electric alternatives, lower motor vehicle emissions due to greater efficiency, cleaner aircraft engine technologies, and changes in aircraft fleet mix.

The 2018/2019 EDR should contain an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The 2018/2019 EDR should also provide discussion of progress on national and international levels to decrease air emissions. Massport should continue to use the FAA's AEDT model for air emissions modeling as was presented in the 2017 ESPR. The 2018/2019 EDR should provide enhanced mitigation related to air emissions to address the potential of 50 million air passengers and increased activity levels if this level of growth is attained prior to the Future Planning Horizon timeframe. A-27 A-28

The EPA Motor Vehicle Emission Simulator (MOVES) tool should continue to be used to assess vehicular emissions on airport roadways. The 2018/2019 EDR should include a mobile sources emissions inventory for CO, NOx, VOCs, and PMs. It should also report on Massport and tenant alternative fuel vehicle programs and the status of Logan Airport air quality studies undertaken by Massport or others, as available. The 2018/2019 EDR should demonstrate that Massport's programs to maintain and increase HOV modes provide the capacity to meet demand associated with growth. The 2018/2019 EDR should also provide an update on its efforts to encourage the use of single engine taxiing under safe conditions. A-29

Commenters continue to express concern regarding ultrafine particulates (UFPs). The 2017 ESPR includes information on the status of UFP review by the Environmental Protection Agency (EPA) and an update on associated and monitoring. The 2018/2019 EDR should include an update on this information. It should also provide an update on the status and the findings of UFP research being performed by Tufts University and Boston University regarding the identification of airport-specific related UFPs in an urban environment. The 2018/2019 EDR should present more direct information about the major research findings around health and airport impacts in relation to emissions, including likely pollution and noise health impacts, and commitments from Massport for the reduction and mitigation of these impacts. A-30

Since October 2014, as a result of the Department of Public Health's (DPH) Logan Airport Health Study, Massport has provided funding for the East Boston Neighborhood Health Center to enhance services and educational resources for children and adults in East Boston and Winthrop who are managing asthma and/or Chronic Obstructive Pulmonary Disease (COPD). Massport should continue to fund this program and should consult with the Health Center to evaluate opportunities to expand current services, outreach, and prevention materials. The expanded program should include collaboration with East Boston and Winthrop public school nurse coordinators to identify additional high risk individuals in schools and ways to expand outreach efforts. I also recommend that Massport work with the Health Center to provide appropriate HEPA room air purifier filters to high risk individuals identified through this program. I encourage Massport to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. The 2018/2019 EDR should describe how Massport will reengage with the Health Center and include an evaluation of how the services A-31

provided directly to and through Health Center (which are funded by Massport) can be expanded.

A-31

Water Quality/Environmental Compliance

The 2017 ESPR describes Massport's ongoing environmental management activities including National Pollutant Discharge Elimination System (NPDES) compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management. Massport's primary water quality goal is to prevent or minimize pollutant discharges, thus limiting adverse water quality impacts of airport activities. Massport employs several programs to promote awareness of activities that may impact surface and groundwater quality. Programs include implementing best management practices (BMPs) for pollution prevention by Massport, its tenants, and its construction contractors; training of staff and tenants; and a comprehensive stormwater pollution prevention plan.

The 2018/2019 EDR should identify any planned stormwater management improvements and report on the status of:

A-32

- NPDES Permit and monitoring results for Logan outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- MCP activities;
- Tank management;
- Update on the environmental management plan; and
- Fuel spill prevention.

Conclusion

Massport may prepare a 2018/2019 EDR for submission consistent with the Scope included in this Certificate. I encourage Massport to target mid 2020 for filing of the 2018/2019 EDR. As noted above, should actual growth in passenger and/or aircraft operations outpace the forecasts, I expect that additional information will be provided in future EDRs to demonstrate that additional mitigation and policies and strategies will be implemented to address the proportional growth in impacts.

K. Theoharides

November 25, 2019
Date

Kathleen A. Theoharides

Comments received:

9/9/2019	Maryann Aberg
9/30/2019	Noel Scott

EEA# 3247 2017 ESPR Certificate November 25, 2019

		11/20/2019	Bill Trabilicy
10/04/2019	Michael Adamian	11/20/2019	Martha Karchere
10/09/2019	Vanessa Fazio	11/20/2019	Julia Burrell
10/09/2019	Danielle Emond	11/20/2019	Peter Houk
10/09/2019	Karla Torres-Welch	11/20/2019	JP Petriello
10/09/2019	Lindsay Falewicz	11/20/2019	Andrea van Wien
10/10/2019	Kannan Thiruvengadam	11/20/2019	Andrea van Wien, 2nd Comment
10/10/2019	Fabricio Paes	11/20/2019	Ryan Miller
10/10/2019	Phoebe Chadwick-Rivinus	11/20/2019	Representative Roselee Vincent
10/10/2019	Mary Palermo	11/21/2019	Representative Adrian Madara
10/10/2019	Gaby Perry	11/21/2019	Airport Impact Relief, Inc.
10/10/2019	Nat Taylor	11/22/2019	City of Malden
10/10/2019	Gillian Anderson	11/22/2019	Catherine McNeil
11/08/2019	Aileen Healy	11/22/2019	Senator Walter Timilty
11/13/2019	Meredith Shannon	11/22/2019	Maureen Wing
11/13/2019	Kathleen Rourke	11/22/2019	Airlines for America
11/13/2019	Teresa Doyle		
11/13/2019	Rosalind Mott	Form Letters sent via email subject line: "Opposition to ESPR 2017"	
11/13/2019	Wendy Corkhum		
11/18/2019	Town of Milton		
11/18/2019	Town of Winthrop	10/ 12/2019	Audrina Warren
11/20/2019	Anastacia Marx de Salcedo	10/ 12/2019	Sara Goldsmith
11/20/2019	Richard Madden	10/ 17/2019	Jim Linthwaite
11/20/2019	Carla Ceruzzi	10/17/2019	Susan M. Horn
11/20/2019	Cindy Christiansen	10/ 17/2019	Jodi Remington
11/20/2019	Mary Tittmann	10/ 17/2019	Monique Labbe
11/20/2019	Nancy Timmerman	10/17/2019	Paul K. Ciampa
11/20/2019	Department of Energy Resources	10/ 17/2019	Colleen Murphy
11/20/2019	Dorothy Ahle	10/ 17/2019	Nancy Hurley-Claflin
11/20/2019	Frank Ciano	10/ 17/2019	Tom Claflin
11/20/2019	Ursula Kullmann	10/ 17/2019	fwb823@yahoo.com
11/20/2019	Romero Kuhn	10/ 17/2019	Robin Maguire
11/20/2019	Matthew A Romero Massport CAC	10/ 17/2019	Steven Tamasy
11/20/2019	Lydia Edwards, Boston City Councilor	10/ 17/2019	Rebecca Lynds
		10/17/2019	John Casamassima
11/20/2019	Conservation Law Foundation	10/17/2019	Kathryn Skogstrom
11/20/2019	Myron Kassaraba	10/17/2019	Lisa DeAngelico
11/20/2019	Carol Goss	10/17/2019	Rebecca Gorlin
11/20/2019	Alan Wright	10/17/2019	Julie Rizzo
11/20/2019	Meredith Shannon	10/17 2019	Andrew Desantis
11/20/2019	Darcey Deveny	10/17/2019	Nikolas Navakos
11/20/2019	Thomas Phipps	10/17/2019	Ida Migliore
11/20/2019	Edward Beuchert	10/17/2019	Christopher Tkach
11/20/2019	Claire Silvers	10/17/2019	Lucas Rossier
11/20/2019	Sheila Mooney	10/17/2019	Jane Paronich
11/20/2019	Lisa Avery	10/17/2019	Charles Cambria
11/20/2019	Danielle Simbajon	10/17/2019	Ali Reed
11/20/2019	Kathleen Rourke	10/17/2019	Nick Camacho
11/20/2019	David Matheu	10/17/2019	Jenn Cunio
11/20/2019	Kathleen Higgins	10/17/2019	Michelle Mccann
11/20/2019	Gary Gryan	10/17/2019	Angela Cilibrasi
11/20/2019	Anita Gryan	10/17/2019	Christy Tatarian
11/20/2019	DeeNee Skipper	10/17/2019	Anthony Leonardi
11/20/2019	Barbara Franklin	10/17/2019	Damien Margardo

10/17/2019	Mary Ryan
10/17/2019	Gail Miller
10/17/2019	Kristen D'Avolio
10/18/2019	Suzanne & Scott
10/18/2019	Bobbie Ross
10/18/2019	Mikki De Sisto Falcone
10/18/2019	Jim Linthwaite
10/18/2019	Rick Sherva
10/18/2019	Michael Mullen
10/18/2019	Kelly O'Keefe
10/18/2019	Mary Oconnor
10/18/2019	Kevin Donahue
10/18/2019	Karen Gaeta
10/18/2019	Sheryl Fleitman
10/18/2019	Kathleen Toland
10/18/2019	Lynn Donovan
10/18/2019	Kathleen Toland
10/18/2019	Cathy Huban
10/18/2019	Leydon, Susan
10/18/2019	Chris Millerick
10/18/2019	Brian Vogel
10/18/2019	Angela Auda
10/18/2019	Deanna Castano
10/18/2019	Rebecca Gorlin
10/18/2019	Angelique Pirozzi
10/18/2019	Gezim Mucelli
10/18/2019	Catherine Sullivan
10/18/2019	Colleen Murphy
10/18/2019	Gina Cassetta
10/18/2019	Dominic Rizzott o
10/18/2019	Kim Brazier
10/18/2019	Sara Swart
10/18/2019	Anne Griepenburg
10/18/2019	Barbara Franklin
10/19/2019	Jeanne Stewart
10/19/2019	Maura Garrity
10/19/2019	Luz-Dary Barlow
10/19/2019	Shannon Viera
10/19/2019	Roberta W Benton
10/19/2019	Mary Gail Murphy
10/19/2019	Kevin Slattery
10/19/2019	Brian Ferrari
10/19/2019	Ian Chiang
10/19/2019	Heather McKinnon Glennon
10/19/2019	Mary Palermo
10/19/2019	Tracey Honan
10/19/2019	Rebecca Connell
10/19/2019	Eivin Hila
10/20/2019	Theodore Resnikoff
10/20/2019	Jaclyn Loson
10/20/2019	Jennifer Harris
10/20/2019	Kathy Masterson
10/20/2019	Nancy Morelli
10/20/2019	Bill Masterson
10/20/2019	Zachary Heath
10/20/2019	Liddy Cole
10/20/2019	Nicole Bishop
10/21/2019	Mariellen Dalton
10/21/2019	Josephine Fatta
10/21/2019	Josephine Matthews
10/21/2019	Julia Collins
10/21/2019	Cheryl Granara
10/21/2019	Ariana Lehrer
10/21/2019	Josephine Fatta
10/21/2019	Jake Bernier
10/21/2019	Carole Brown
10/22/2019	Aleksandra Kuzina
10/22/2019	Roberta W Benton
10/22/2019	Dominique Bonafoux
10/22/2019	Robert Fiore
10/22/2019	Marie Piacenza
10/22/2019	Dawn Sullivan
10/22/2019	Frederico Leal
10/22/2019	Joan Dimarzo
10/22/2019	Vincent Crossman
10/22/2019	Wendy Corkhum
10/22/2019	Tracey Honan
10/22/2019	Lisa Foley
10/22/2019	johnbegood73@outlook.com
10/22/2019	Teresa Carroll
10/22/2019	Cindy L. Christiansen
10/22/2019	Elizabeth Tanefis
10/22/2019	Danielle Meeker
10/22/2019	Carol Leary
10/22/2019	Nick Loconte
10/22/2019	Deborah Lalone
10/22/2019	Elaine Sullivan
10/22/2019	James Roberts
10/22/2019	Albee Schimanski
10/22/2019	Bill Curtis
10/22/2019	Isabella Tocci
10/22/2019	James Roberts
10/22/2019	William Tanner
10/22/2019	Lisa Jacobson
10/22/2019	Magdalena Ayed
10/22/2019	Jenn Goonan
10/22/2019	Patricia Dunn
10/23/2019	Judith Gundersen
10/23/2019	Donna Swanson
10/23/2019	Trudy Marsoloni
10/23/2019	Liz ORourke
10/23/2019	Linda Nelson
10/23/2019	Stacie and Brian Marley
10/23/2019	Carole Brown
10/23/2019	Scott Gagnon
10/24/2019	Hagar Shirman
10/25/2019	Christopher Pearl
10/25/2019	Wendy Corkhum
10/26/2019	Jane Moncreiff
10/26/2019	Roberta W Benton
10/26/2019	Kim Brazier
10/26/2019	David Brazier

10/27/2019	Martin Shannon
10/27/2019	Zachary Speert
10/28/2019	Layne Petrie
10/28/2019	Suzanne Knight
10/29/2019	Maria Drewnowski
10/29/2019	Scott Oakley Hersey
10/30/2019	Paul Skogstrom
10/30/2019	Jonathan Hess
10/31/2019	Christopher Marchi
10/31/2019	Amy Tai
11/03/2019	Baljinder Nijjar
11/03/2019	Jonvante Nijjar
11/03/2019	Jasmine Nijjar
11/03/2019	Sandra Nijjar
11/03/2019	Magdalena Ayed
11/04/2019	arytych@voyager.net
11/05/2019	Julia Wallerce
11/05/2019	Alyssa Vangeli
11/16/2019	Gail Miller
11/16/2019	Sonja Tengblad
11/17/2019	Anne Riesenfeld
11/17/2019	Sarah Paysnick
11/17/2019	Meredith Krebs-Smith
11/17/2019	Charles Blandy
11/18/2019	Jonathan Hess
11/18/2019	Catherine McNeil, 1st Comment
11/18/2019	Catherine McNeil, 2nd Comment
11/18/2019	Catherine McNeil, 3rd Comment
11/18/2019	Beth Battson
11/18/2019	Charles Bartoloni
11/18/2019	Anita Albright
11/18/2019	Judith Gundersen
11/18/2019	Brian Crosse
11/18/2019	Amy King
11/18/2019	Suzanne Knight
11/18/2019	Peter Dunn
11/18/2019	Johanna Bronk
11/18/2019	Allison Donelan
11/18/2019	Andrea LeBlanc
11/19/2019	Daryl Warner
11/19/2019	Ellen Daly
11/25/2019	Kevin Donahue

KAT/ACC/acc

This Page Intentionally Left Blank.

Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the *Logan Airport 2016 EDR Notice of Project Change*

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

March 9, 2018

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
NOTICE OF PROJECT CHANGE

PROJECT NAME	: 2016 Environmental Status and Planning Report (ESPR)/ Environmental Data Report (EDR)
PROJECT MUNICIPALITY	: Boston/Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: February 7, 2018

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62I) and Section 11.10 of the MEPA regulations (301 CMR 11.00), I have reviewed the Notice of Project Change (NPC) and **hereby determine** that a Supplemental Environmental Impact Report (EIR) is not required.

The NPC consists of a request by the Massachusetts Port Authority (Massport) to shift the timing and sequence of the 2016 Environmental Status and Planning Report (ESPR) and 2017 Environmental Data Report (EDR). Massport has proposed this change because it is concerned that 2016 is not an appropriate baseline year from which to forecast long-term operational and environmental conditions. The NPC indicates that the concern is based changes associated with: (1) rapidly growing domestic and international passenger demand; (2) the formal introduction to Logan Airport of transportation network companies (TNC), such as Uber and Lyft, in early 2017; and (3) use of the Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) for noise and air quality modeling for 2016 reporting.

I am granting this request based on the following:

- Massport will submit a 2016 EDR in lieu of the ESPR.
- The 2016 EDR will supplement typical EDR data reporting with discussion of future passenger and activity levels, planning to address growth and strategies to minimize environmental impacts.
- The 2016 EDR will include a draft Scope for the 2017 ESPR and identify when the ESPR will be filed.

Logan Airport Environmental Review and Planning

The environmental review process for Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The ESPR has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of the long-range planning process for Massport. The ESPR provides a "big picture" analysis of the environmental impacts associated with current and projected activity levels, and presents a comprehensive strategy to minimize impacts.

The ESPR is generally updated on a five-year basis. EDRs (formerly referred to as Annual Updates) are filed annually in the years between ESPRs. EDRs consist of a status report and annual reporting on activity levels and associated environmental impacts at Logan Airport. ESPR's are also supplemented by (and ultimately incorporate) project-specific Environmental Impact Reports (EIR) that provide detailed analyses and mitigation commitments for proposed projects. The sequence and timing for submitting ESPRs and EDRs has been adjusted previously based on consultation between Massport and the Executive Office of Energy and Environmental Affairs (EEA). Most recently, with EEA approval, Massport deferred submittal of the 2011 ESPR by two years based on the regional and national economic downturn experienced in the mid- to late-2000s.

Through these reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment on cumulative impacts. This regular updating and reporting on planning and cumulative impacts is unique among State Agencies. It reflects the challenge and complexity of managing and modernizing Logan Airport within a dense, urban area. It recognizes that the proximity of communities to the Airport warrants an enhanced level of public engagement and a concerted, long-term effort to minimize and mitigate impacts.

On February 17, 2017, I issued a Certificate on the 2015 EDR which contained a review of the 2015 EDR and Scope for the 2016 ESPR. This Certificate on the NPC is informed by and includes references to the 2015 EDR, data and conclusions. This Certificate supplements, but does not replace, the 2015 EDR Certificate. The Scope for the 2017 EDR will be revised based on the review of the 2016 EDR.

In 2015, Logan Airport served an all-time high of 33.4 million passengers, exceeding the 2014 historic peak. A significant portion of growth in passengers is driven by an increase in demand for international air service. Massport has responded to this demand by providing new service to international destinations and expanding service to existing destinations. As passenger levels have increased, aircraft operations remain significantly below the peak of 507,449 operations experienced in 1998 when Logan Airport served 26.5 million passengers. The reduction of over 130,000 annual flight operations combined with transition towards newer and larger aircraft with improved environmental performance and operational efficiencies, have supported passenger growth while limiting environmental impacts.

The long-term trend is towards more efficient operations and significant reductions in overall environmental impacts. Although environmental impacts are significantly lower compared to 1998 when operations were highest, comparison of activity level and environmental impact data to 2014 and more recent EDRs identifies increases in noise exposure, air emissions and traffic. These increases were not forecast in the 2011 ESPR. The increases are associated with passenger growth, changes in flight patterns and changes in modeling of noise and air quality.

The most significant change since 2011 is the introduction by the FAA of changes to area navigation (RNAV) procedures. The RNAV program has been implemented throughout the country and its primary purpose is to increase safety and operational efficiency. The implementation of several of these procedures has resulted in concentrations of flight patterns over certain communities and significant increases in noise exposure.

The impact of the RNAV program was reflected in the many comment letters received during review of specific projects, including the Terminal E Modernization Project (EEA# 15434). Massport and the FAA signed a Memorandum of Understanding (MOU) in 2017 to frame a new process for analyzing opportunities to incrementally reduce noise through changes or amendments to Performance Based Navigation, including RNAV procedures.

Another significant change identified in the 2015 EDR was the introduction of AEDT for emissions and noise modeling. Based on its evaluation of the model, Massport requested that FAA approve development of specific adjustments to the AEDT model consistent with those developed for the Integrated Noise Model (INM). Based on this consultation, Massport deferred use of the AEDT. Projections in the 2016 EDR will be based on AEDT and will provide an opportunity to review and comment on the model and results prior to its use in the 2017 ESPR.

In addition, Logan Airport passenger ground access is changing rapidly with the use of TNCs for departures and arrivals at the Airport. Massport has been collecting TNC data since February 2017 when TNCs began picking up, in addition to dropping off, at Logan. The 2017 ESPR will include limited data from 2016 and a year of data for 2017. NPC-2

The Scope for the 2016 EDR will include description and analysis of these changes which will influence results and projections and provide context for the 2017 ESPR. The deferment of the ESPR until 2019 will provide more meaningful data and will be employed to develop a more reliable baseline from which activity and impacts can be projected.

Scope for the 2016 EDR

General

The 2016 EDR should follow the general format of the 2015 EDR to provide an update on conditions at Logan Airport, including passenger and aircraft operation activity levels. It should include an Executive Summary and Introduction, similar to previous ESPRs and EDRs.

The 2016 EDR must include information on the environmental policies and planning that form the context of environmental reporting, technical studies, and environmental mitigation initiatives against which projects at Logan Airport can be evaluated. This should include identification of the cumulative effects of Logan Airport operations and activities, compared to previous years, as appropriate. It should report on status of Massport's proposed planning initiatives, projects, and mitigation measures. The results of the 2016 Logan Airport Air Passenger Ground Access Survey and the Long-term Parking Management Plan should be used in the 2016 EDR to inform transportation planning.

The technical studies should include reporting on and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking. The 2016 EDR must also respond to those issues explicitly noted in this Certificate and the comments received on the 2015 EDR and noted in the February 17, 2017 Certificate. NPC-3

A distribution list for the 2016 EDR (indicating those receiving documents, CDs, or Notices of Availability) should be provided in the document. This section must also include copies of all ESPR and EDR Certificates. Supporting technical appendices should be provided as necessary.

Response to Comments

The Response to Comments section should address all of the substantive comments on the 2015 EDR, and other Certificates for Logan Airport that reference EDR/ESPR documentation (e.g. Logan Airport Parking Project, Terminal E). To ensure that the issues raised by commenters are addressed, the 2016 EDR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the 2016 EDR beyond what has been expressly identified in this Certificate. I recommend that the Massport continue to use the format from the 2015 EDR. The Responses to Comments should not reference a section of the 2016 EDR unless they are directly responsive to the comment. Common themes that should be addressed throughout the EDR and in the Responses to Comments include noise (modeling of noise contours and noise abatement) and emissions reduction issues. The 2016 EDR should include sufficient information to address comments on traffic, air quality and public health which are common concerns of commenters. NPC-4 NPC-5

Activity Levels

Air traffic activity levels at Logan Airport are the basis for the evaluation of noise, air quality, and ground access conditions associated with the Airport. In this section, current activity levels at the Airport are compared to prior-year levels, and historical passenger and operations trends at Logan Airport dating back to 2000 which is the year Massport approved an Environmental Management Policy. The total number of air passengers increased by 5.7 percent to 33.4 million in 2015, compared to 31.6 million in 2014. As noted previously, the 2015 passenger level represents a record high for Logan Airport.

Passenger aircraft operations accounted for 91 percent of total aircraft operations in 2015. The total number of aircraft operations increased from 363,797 in 2014 to 372,930 in 2015, a 2.5-percent increase. This was preceded by a 0.7 percent increase from 2013 to 2014. Although operations are increasing compared to previous years, aircraft operations at Logan Airport remained well below the 487,996 operations in 2000 and the historical peak of 507,449 achieved in 1998. In 1998, Logan Airport served 26.5 million air passengers, compared to 33.4 million in 2015, which saw 134,519 fewer operations.

Air carrier efficiency continued to improve in 2015 as the average number of passengers per aircraft operation at Logan Airport grew from 87.0 in 2014 to 89.7 in 2015. This positive trend is indicative of the industry-wide shift toward higher aircraft load factors and an increase in the number of domestic and international destinations. Annual domestic passengers' activity levels increased from 26.5 million in 2014 to 27.8 million in 2015, a 4.8-percent increase. While the numbers of both domestic and international passengers have increased, international passenger demand continues to increase at a faster rate than domestic passenger demand. Total international passengers at Logan Airport increased from 5.0 million in 2014 to 5.5 million in 2015, a 10.9-percent increase. International passengers made up approximately 16.1 percent of total Airport passengers in 2015, and this is projected to increase steadily to nearly 20 percent of the total by 2030 or sooner. The 2015 EDR indicates that strong international passenger growth was driven by the economic attractiveness of the metropolitan Boston region and the strength of Boston as an origin and destination market. New international destinations from Logan Airport in 2015 included Mexico City, Hong Kong, Tel Aviv, and Shanghai.

The NPC indicates that passenger activity has continued to grow faster than forecasts provided in the 2015 EDR and that it is outpacing growth in aircraft operations. The 2016 EDR should describe how this trend will support Massport's long-standing goals to reduce overall operating and environmental impacts at the airport. 2016 The EDR should include more discussion of future passenger and activity levels and planning/mitigation to address impacts of growth than that which is typically provided in an EDR. NPC-6

The 2016 EDR should report on airport activity levels and aircraft operations, including:

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Domestic and international passenger activity levels;
- Cargo and mail volumes;
- Compare 2016 aircraft operations, cargo/mail operations, and passenger activity levels to 2015 activity levels; and
- National aviation trends compared to Logan Airport trends.

Sustainability at Logan Airport

The 2015 EDR described Massport's airport wide sustainability goals as identified in its Environmental Management Policy (EMP) and 2015 Sustainability Management Report (SMR). The SMR identifies efforts to promote, coordinate and integrate sustainability Airport-wide. Progress towards achieving these goals was addressed in the 2015 EDR. Massport revised its Sustainable Design Standards and Guidelines (SDSG) in March 2011 which provide a framework for sustainable design and construction for both new construction and rehabilitation projects. Since 2000 Massport has been striving to achieve certification by the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) for new and substantial rehabilitation of building projects over 20,000 square feet (sf).

The 2016 EDR should report on progress on achieving EMP goals.

Climate Change

Massport assets and Logan Airport, in particular, are critical infrastructure and play an important role in the economy. As recognized in Governor Baker's recent Executive Order 569 "Establishing an Integrated Climate Change Strategy for the Commonwealth" and a suite of other state and municipal initiatives, the impacts of climate change must be an important consideration for development across the state. Climate change presents a serious threat to the environment and the Commonwealth's residents, communities and economy. The EO indicates that extreme weather events associated with climate change present a serious threat to public safety and the lives and property of our residences. The recent flooding and storm damage caused by two storms in early March underscore these risks and the importance of adaptation and resiliency planning.

The EO also identifies the transportation sector as a significant contributor to GHG emissions in the Commonwealth and the only sector in which GHG emissions are increasing. In 2017, EEA and the Massachusetts Department of Transportation (MassDOT) conducted a number of transportation listening sessions throughout the Commonwealth to inform development of strategies and programs to reverse the growth in this sector.

Massport has begun reporting on GHG emissions and, in recognition of the potential effects of climate change on Massport infrastructure and operations, Massport initiated a Disaster and Infrastructure Resiliency Planning (DIRP) Study. A particular concern for Massport is the effect of sea level rise and projected increases in the severity and frequency of storms. The Study includes Logan Airport, the Port of Boston, and Massport's waterfront assets in South and East Boston. The DIRP Study includes a hazard analysis; modeling of projected sea-level rise and storm surge; temperature and precipitation projections; and anticipated increases in extreme weather events.

The 2016 EDR should provide a summary of the DIRP Study and identify which recommendations Massport will implement in the short term to increase the resiliency of its facilities to the potential effects of climate change.

Mitigation

The 2015 EDR identifies the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review. The 2016 EDR will continue to be the forum to address cumulative, Airport-wide impacts. The 2016 EDR should update the status of mitigation commitments for recent projects such as the Terminal E Modernization Project and the Logan Airport Parking Project as well as projects previously included in the 2015 EDR.

Planning

The Airport Planning section of the 2016 EDR should describe the status of projects underway or completed at Logan Airport by the end of 2016 and provide updates for projects in progress. It should address planning, construction, and permitting activities. Specific topics include terminal area projects, service area projects, buffer/open space projects, Airport parking projects, airside area projects, high occupancy vehicle (HOV) improvements, and Airport-wide projects. Project updates include:

- *Terminal E Renovation and Enhancements Project*: This project includes interior and exterior improvements at Terminal E to accommodate regular service by wider and longer Group VI aircraft. The project will reconfigure three gates to accommodate Group VI aircraft (including the Airbus A380 and Boeing 747-8 primarily used by international air carriers) and will reconfigure passenger holdrooms to accommodate larger passenger loads associated with these aircraft. Construction commenced in 2015.

- *Terminal E Modernization Project*: This project will accommodate existing and long range forecasted demand for international service. The expansion will add the three gates approved in 1996 (International Gateway West Concourse project, EEA #9791), which were never constructed, and an additional two to four additional new gates in an extended concourse. A key feature of this project is the first direct pedestrian connection from the MBTA Blue Line Airport Station to the terminal complex at Logan Airport. It will also include improvements to Airport roadways to facilitate access. The project completed MEPA review in 2016. Phase 1 has been permitted and is in the final design stage.

- *Terminal C to E Connector:* This project provides a new post-security connection between Terminals C and E on the Departures Level and provides improved passenger circulation within the post-security concourses, additional holdroom space at Terminal E, reconfigured office space, concessions and concessions support, and a new consolidated location for escalators and stairs. The project was completed in May 2016.

- *Terminal B Airline Optimization Project:* Massport is upgrading its facilities on the Pier B side of Terminal B to meet airlines' needs (primarily reflecting the merger of American Airlines and US Airways) and to provide facilities that improve the passenger traveling experience. Similar improvements have been implemented with the recent renovations and improvements at Terminal B, Pier A. Planned improvements include an enlarged ticketing hall, improved outbound bag area, expanded bag claim hall, expanded concession areas, and expanded holdroom capacity at the gate.

- *Logan Airport Parking Project*: This project includes the construction of up to 5,000 new commercial parking spaces to reduce trip generation associated with increases in passenger drop-off and pick-up at the airport. The Certificate on the ENF was issued on May 5, 2017 and included a Scope for the Draft Environmental Impact Report (DEIR). This project required an amendment to the Logan Airport Parking Freeze Regulations (310 CMR 7.30). MassDEP proposed amendments to the regulations on March 24, 2017 and amendments were promulgated last year.

In the absence of a 2016 ESPR and the significant public interest in passenger growth, ground access, noise and air quality, the 2016 EDR should provide a broader context for long range planning than would normally be included in an EDR. It should address planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. The 2016 EDR should describe the status of planning initiatives for the following areas: NPC-7

- Roadways and Airport Parking;
- Terminal Area;
- Airside Area;
- Service and Cargo Areas; and
- Airport Buffers and Landscaping.

The 2016 EDR should describe the status and effectiveness of ground access changes, including roadway and parking projects, that consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on streets in adjacent neighborhoods.

Regional Transportation

The 2015 EDR describes activity levels at New England's regional airports in 2015 and provides an update on regional planning activities, including long-range transportation efforts. The New England region is anchored by Logan Airport and a system of 10 other commercial service, reliever, and general aviation (GA) airports (regional airports). In 2015, passenger traffic at the New England airports represented the highest passenger traffic level for the region since the economic downturn in 2008 and exceeded the historical peak of 48.0 million in 2005. The increase in the region's passenger traffic was largely driven by continued growth at Logan Airport. In 2015, the total number of air passengers utilizing New England's commercial service airports, including Logan Airport, increased by 4.1 percent from 46.8 million annual air passengers in 2014 to 48.7 million in 2015. Of the 48.7 million passengers, 68.6 percent of passengers (33.4 million) used Logan Airport compared to 67.6 percent (31.6 million) in 2014. Aircraft operations in the region remained flat in 2015, increasing 0.3 percent from 987,652 operations in 2014 to 991,041 operations in 2015.

Regional Airports

- 2016 regional airport operations, passenger activity levels, and schedule data within an historical context;
- Status of plans and new improvements as provided by the regional airport authorities;
- Role of the Worcester Regional Airport and Hanscom Field in the regional aviation system and Massport's efforts to promote these airports; and
- Ground access improvements at Massachusetts Regional Airport.

Regional Transportation System

- Massport's role in managing the regional transportation facilities within MassDOT;
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership.

Ground Access to and from Logan Airport

The 2015 EDR reports on transit ridership, roadways, traffic volumes, and parking for 2015. Specifically, the EDR states that Massport has continued to invest in and operate Logan Airport with a goal of increasing the number of passengers arriving by transit or other high occupancy vehicle (HOV) modes.

Massport remains in compliance with the Parking Freeze regulations which regulates the number of commercial and employee parking spaces allowed at Logan Airport (total limit of 21,088). Massport submits semi-annual compliance filings to MassDEP; March and September reports are provided in the 2015 EDR. As permitted (and encouraged) by the regulations, Massport has converted employee spaces to commercial spaces, within the overall limits.

The HOV/transit mode share at Logan Airport continues to rank at the top of U.S. airports. At the same time, private passenger vehicle trips continue to increase as air travel grows. Massport has indicated that as passenger levels have increased, the constrained parking supply at Logan Airport has resulted in an increase in pick-up and drop-off vehicle trips. Despite an increase in terminal area parking rates on July 1, 2014, daily parking demand more frequently approached the Parking Freeze cap in 2015. As described previously, Massport is proposing to construct additional parking to reverse this trend.

The Airport's gateway roadways are equipped with permanent traffic count stations, as part of the Airport-wide Automated Traffic Monitoring System (ATMS). These stations provide data on annual average daily traffic (AADT), annual average weekday daily traffic (AWDT), and annual average weekend daily traffic (AWEDT). The AADT (entering and departing Logan Airport via its gateway roadways) increased by 0.1 percent between 2014 and 2015. The change in average daily traffic can be attributed to: a 5.7-percent increase in air passenger activity in 2015; a 3.0-percent increase in taxi dispatches in 2015; and 1.1-percent decrease in parking activity (exits) in 2015. Historically, the highest AADT recorded at Logan Airport was in 2007, when AADT reached 110,690, AWDT was 119,200, and AWEDT was 91,320 that same year. These gateway traffic volumes corresponded to an annual air passenger level of 28,102,455 passengers. Current AADT and AWDT values are 2 and 5 percent (respectively) lower than current on-Airport traffic volumes despite a 19.0-percent increase in air passenger levels from 2007 to 2015.

On-Airport VMT is calculated based on the total number of miles traveled by all vehicles within the Logan Airport roadway system. In 2011 as detailed in the 2011 ESPR, Massport upgraded its modeling capabilities and began using an on-Airport VISSIM-10 model to estimate VMT. Based on the ATMS data, the change in on-Airport daily traffic volumes between 2014 and 2015 was negligible. However, 2015 evening peak hour gateway volumes grew by roughly 5 percent when compared to 2014. Additionally, a shift in gateway traffic entering/exiting the Airport from the Ted Williams Tunnel to the Sumner/Callahan Tunnels was noted. Daily traffic volumes in the Ted Williams Tunnel decreased by 8.4 percent (from 49,600 to 45,400 vehicles) while volumes in the Sumner/Callahan Tunnels increased by 19.5 percent (from 29,800 to 35,600 vehicles). Since 2000, the highest average weekday VMT estimated at Logan Airport was in 2007, when weekday VMT was modeled at 184,613.

The 2015 EDR describes improvements to support HOV access which include: Back Bay Logan Express pilot service (since May 2014); free MBTA Silver Line outbound (from Logan Airport) boardings; a 1,100-car parking garage at the Framingham Logan Express; reduced holiday travel parking rates at Logan Express facilities; increased parking rates on the Airport; and support for private coach bus and van operators.

As noted previously, TNCs such as Lyft and Uber that did not exist just a few years ago are becoming prominent providers of Logan Airport passenger ground access/egress. According to the NPC, this new mode is already beginning to have a dramatic impact on how passengers arrive and depart Logan Airport. Using TNC data collected since February 2017 when TNCs began picking up at Logan will provide a better indication of future ground access mode share than using limited 2016 information. The 2016 EDR should describe how this TNC data collection and analysis will be incorporated into the 2017 ESPR. NPC-8

The 2016 EDR should report on 2016 ground access conditions at the airport and provide a comparison of 2016 findings to those of 2015 for the following:

- Detailed description of compliance with Logan Airport Parking Freeze;
- High-occupancy vehicle (HOV) ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express);
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport vehicle miles traveled (VMT);
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning;
- Results of the 2016 Logan Airport Air Passenger Survey; and,
- Status of proposed connector to the Airport Station associated with the planned Terminal E Modernization Project.

The 2016 ESPR should address the following topics:

- Massport's target HOV mode share along with incentives;
- Non-Airport through-traffic;
- Massport's cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Silver Line, Water Transportation, and Logan Express;
- Report on Logan Express usage and efforts to increase capacity and usage;
- Progress on enhancing water transportation to and from Logan Airport;
- Report on results of ground access study; and
- Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.

Noise

The 2015 EDR updated the status of the noise environment at Logan Airport in 2015, and described Massport's efforts to mitigate noise exposure and impacts. As noted previously, the implementation of RNAV has resulted in concentration of flight patterns over certain communities and significant increases in noise exposure. At the same time, the FAA introduced the AEDT for modeling noise and air quality. Massport did not submit AEDT modeling results for 2015. Noise was modeled using the FAA INM. Massport will use the AEDT for noise modeling for the 2016 EDR. NPC-9

Compared to 2000, overall operations were down by 23.6 percent while overall passengers were up by 20.6 percent; jet operations made up 86 percent of operations compared to 66 percent; and the number of people exposed to Day-Night Average Sound Level (DNL) 65 decibels (dB) has declined by 20.6 percent.

Compared to 2014, the 2015 DNL 65 dB noise contours were larger in most areas around the Airport due to changes in: (1) runway usage, primarily as a result of wind and weather conditions, (2) an increase in the number of nighttime operations, and (3) an increase in the number of overall operations. The overall number of people exposed to DNL values greater than or equal to 65 dB increased by 58.0 percent, from 8,922 people in 2014 to 14,097 people in 2015.

Runway use changes from 2014 to 2015 were the largest factor in the increase in the number of people exposed to DNL values greater than or equal to 65 dB. The DNL contour increased in East Boston and slightly in South Boston due to an increase in Runway 22R departures. Increased departures from Runway 22L also resulted in increases in Winthrop. Increased arrivals to Runways 22L and 27 at night contributed to increases in Revere and Winthrop. Unlike 2014, 2015 reflects almost a full year of the head-to-head night noise abatement procedures on Runway 15R-33L. While this reduces overall noise exposure by concentrating operations over water rather than over populated areas, it increases start-of-takeoff-roll noise in East Boston, north and west of the Runway 15R end. Lower use of Runway 4R for arrivals in 2015 resulted in a reduction in the contour south of the Airport.

An additional factor influencing noise contour changes in 2015 was a 5.7-percent increase in nighttime operations (from 48,056 nighttime operations in 2014 to 50,786 nighttime operations in 2015). This increase in overall operations and nighttime operations is still well below the peak of 54,038 annual operations at night reached in 1999. As airlines have expanded to new destinations, the number of commercial operations, and in turn the number of nighttime operations, has increased. In 2015, there was an increase of 7.5 nighttime operations per day compared to 2014.

The overall increase in operations was smaller than the increase in nighttime operations (2.5 percent overall versus 5.7 percent nighttime), but contributed to the expansion of the noise contours. The DNL and population levels in 2015 remain well below the peak levels reached in 1990 and are less than in the year 2000 when 17,745 people were exposed to DNL levels greater than or equal to DNL 65 dB. The 2015 DNL 65 dB contour is somewhat larger than the 2014 DNL 65 dB contour. Almost all of the residences exposed to levels greater than or equal to DNL 65 dB in 2015 have been eligible to participate in Massport's residential sound insulation program (RSIP).

To date, Massport has provided sound insulation for a total of 11,515 residential units, and will continue to seek funding for sound insulation for properties that are eligible and whose owners have chosen to participate. The 2016 EDR should provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2016 conditions and provide a comparison to 2015 for the following:

- Fleet Mix, including Stage II, Recertified Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft;
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals);
- Preferential runway advisory system (PRAS) tracking; and
- Flight tracks.

The 2016 EDR will be based on AEDT for the first time. The initial analysis will provide a baseline from which to project noise conditions in the future.

Noise contours for 2016 should be developed using AEDT and compared to the most recent version of the INM which has been in place for all previous EDRs and ESPRs. The 2016 EDR should report on the following:

- Changes in annual noise contours and noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed;
- Cumulative Noise Index (CNI);
- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and
- Flight track monitoring noise reports.

The 2016 EDR should also report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) study, and provide an update on the noise and operations monitoring system.

Air Quality/Emissions Reduction

The 2015 EDR provided an overview of airport-related air quality issues in 2015 and efforts to reduce emissions. The air quality modeling is based on aircraft operations, fleet mix characteristics, and airfield taxiing times combined with ground support equipment (GSE) usage, motor vehicle traffic volumes, and stationary source utilization rates. Total air quality emissions from all sources associated with Logan Airport are significantly lower than a decade ago.

In 2015, calculated emissions of volatile organic compounds (VOCs), oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM) went up slightly compared to 2014. The increase is primarily due to the corresponding increase in aircraft landing and take offs (LTOs) and airfield taxi times. Total emissions of VOCs increased by 1 percent in 2015 to 1,188 kilograms (kg)/day compared to1,177 kg/day in 2014, which is still well below 1990 and 2000 levels. Total NOx emissions increased by approximately 5 percent in 2015, to 4,262 kg/day compared to 2014 levels of 4,040 kg/day. Massport's voluntary Air Quality Initiative (AQI) has tracked NOx emissions since the benchmark year of 1999. In the final year of this program (2015), total NOx emissions were 632 tons per year (tpy) lower than the 1999 benchmark. This represents a decrease of 27 percent in NOx emissions over the past 15 years. Between 1999 and 2015, the greatest reductions of NOx emissions were associated with aircraft, ground service equipment (GSE), and on-Airport motor vehicles at 17 percent, 71 percent, and 87 percent reductions, respectively. Massport has committed to continue to report on NOx emissions as part of the Logan Airport emissions inventory in future EDRs/ESPRs. Total CO emissions increased by about 3.5 percent in 2015 to 7,243 kg/day, from 6,987 kg/day in 2014; emissions in 2015 were still well below 1990 and 2000 levels. Total PM10/PM2.5 emissions also increased by about 3 percent in 2015 to 98 kg/day, from 95 kg/day in 2014.

The increases are associated with transportation and a significant portion is due to changes in modeling from MOBILE 6.2.03 to MOVES 2014a. Use of this program provides consistency with the State Implementation Plan (SIP) and MassDEP's methodologies.

The 2015 EDR contains a greenhouse gas (GHG) emissions inventory for the Logan Airport EDR. In 2015, total GHG emissions grew by 6 percent. As reported in past year EDRs, Logan Airport-related GHG emissions in 2015 comprised less than 1 percent of statewide totals.

The 2016 EDR should contain an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The 2016 EDR should also provide discussion on progress on the national and international levels to decrease air emissions. Massport has committed to use the FAA's AEDT model for air emissions modeling. The 2016 EDR should compare results to the most recent version of the Emissions Dispersion Modeling System (EDMS) that has been used in recent EDR filings. NPC-10

The EPA Motor Vehicle Emission Simulator (MOVES) tool will continue to be used to assess vehicular emissions on airport roadways. The 2016 EDR should include an emissions inventory for CO, NOx, VOCs, and PMs. It should also report on Massport and tenant alternative fuel vehicle programs and the status of Logan Airport air quality studies undertaken by Massport or others, as available.

The 2016 EDR should incorporate GHG emissions reporting. The 2015 EDR provided extensive data on GHG emissions. As required in the Certificate on the 2015 EDR, Massport should consider changes to the presentation of this data and normalizing it to support effective review and analysis. Massport should consult with the MEPA Office and DOER regarding presentation of GHG data in the 2016 EDR and subsequent ESPR. NPC-11

The 2016 EDR GHG emissions should continue to be quantified for aircraft, GSE, motor vehicles and stationary sources using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (Airport Cooperative Research Program (ACRP) Report 11, Project 02-06). The results of the 2016 GHG emissions inventory should be compared to the 2015 results.

Massport should also provide an update on its efforts to encourage the use of single engine taxiing under safe conditions. In addition, the 2016 EDR should provide an update on the feasibility of combined heat and power (CHP) use for Terminal E and updates to progress made in designing the energy systems for the facility.

Water Quality/Environmental Compliance

The 2015 EDR describes Massport's ongoing environmental management activities including National Pollutant Discharge Elimination System (NPDES) compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management. Massport's primary water quality goal is to prevent or minimize pollutant discharges, thus limiting adverse water quality impacts of airport activities. Massport employs several programs to promote awareness of activities that may impact surface and groundwater quality. Programs include implementing best management practices (BMPs) for pollution prevention by Massport, its tenants, and its construction contractors; training of staff and tenants; and a comprehensive stormwater pollution prevention plan.

The 2016 EDR should identify any planned stormwater management improvements and report on the status of:

- NPDES Permit and monitoring results for Logan outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- MCP activities;
- Tank management;
- Update on the environmental management plan; and
- Fuel spill prevention.

Conclusion

Massport may prepare a 2016 EDR for submission in 2018 consistent with the Scope included in this Certificate. Massport has indicated that the 2016 EDR will be filed within the next few months. The 2016 EDR should include a draft Scope for the 2017 ESPR and identify a date by which the 2017 ESPR will be filed. I encourage Massport to target early 2019 for filing of the 2017 ESPR. | NPC-12

March 9, 2018
Date

Matthew A. Beaton

No comments received.

MAB/ACC/acc

Copies of the Secretary of the Executive Office of Energy and Environmental Affairs Certificates issued for the Reporting Years 2016, 2015, 2014, 2012/2013, and 2011

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

August 10, 2018

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
2016 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2016 Environmental Data Report (EDR)
PROJECT MUNICIPALITY	: Boston/Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: May 23, 2018

As Secretary of Executive Office of Energy and Environmental Affairs (EEA), I hereby determine that the Environmental Data Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA) (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

Logan Airport Environmental Review and Planning

The environmental review process for Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of the Massachusetts Port Authority's (Massport) long-range planning process. The ESPR provides a "big picture" analysis of the environmental impacts associated with current and projected activity levels, and presents a comprehensive strategy to minimize impacts.

The ESPR is generally updated on a five-year basis. The most recent ESPR for the year 2011 was filed in April of 2013. Environmental Data Reports (EDRs) (formerly referred to as Annual Updates) are filed in the years between ESPRs.

EDRs consist of a status report and annual reporting on activity levels and associated environmental impacts at Logan Airport. ESPR's are also supplemented by (and ultimately incorporate) project-specific Environmental Impact Reports (EIR) that provide detailed analyses and mitigation commitments for proposed projects.

Through these reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment on cumulative impacts. This regular updating and reporting on planning and cumulative impacts is unique among State Agencies. It reflects the challenge and complexity of managing and modernizing Logan Airport within a dense, urban area. It recognizes that the proximity of communities to the Airport warrants an enhanced level of public engagement and a concerted, long-term effort to minimize and mitigate impacts.

In February, 2018, Massport submitted a Notice of Project Change (NPC) regarding a request to shift the timing and sequence of the 2016 ESPR and 2017 EDR. The NPC indicated that 2016 was not an appropriate baseline year from which to forecast long-term operational and environmental conditions. The concern was based on changes associated with: (1) rapidly growing domestic and international passenger demand; (2) the formal introduction to Logan Airport of transportation network companies (TNC), such as Uber and Lyft; and (3) use of the Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) for noise and air quality modeling for 2016 reporting.

The sequence and timing for submitting ESPRs and EDRs had been adjusted previously based on consultation between Massport and the Executive Office of Energy and Environmental Affairs (EEA). Most recently, with EEA approval, Massport deferred submittal of the 2011 ESPR by two years based on the regional and national economic downturn experienced in the mid- to late-2000s. In a certificate on March 9, 2018 I granted the request to submit a 2016 EDR in lieu of the ESPR and issued the Scope for the EDR.

In 2016, passenger activity at Logan Airport has continued to grow faster than previous forecasts. A significant portion of growth in passengers is driven by an increase in demand for international air service. Massport has responded to this demand by providing new service to international destinations and expanding service to existing destinations. As passenger levels have increased, aircraft operations remain significantly below the peak of 507,449 operations experienced in 1998 when Logan Airport served 26.5 million passengers. The reduction of over 130,000 annual flight operations combined with transition towards newer and larger aircraft with improved environmental performance and operational efficiencies, have supported passenger growth while limiting environmental impacts.

The long-term trend is towards more efficient operations and significant reductions in overall environmental impacts. Although environmental impacts are significantly lower

compared to 1998 when operations were highest, comparison of activity level and environmental impact data to 2014 and more recent EDRs identifies increases in noise exposure, air emissions and traffic. These increases were not forecast in the 2011 ESPR. The increases are associated with passenger growth, changes in flight patterns and changes in modeling of noise and air quality. The 2016 EDR indicates that terminals, roadways and parking facilities are strained by these increases.

Logan Airport passenger ground access is changing rapidly with the use of TNCs for departures and arrivals at the Airport. Massport has been collecting TNC data since 2017 when TNCs were authorized to pick up customers from the airport. The 2016 EDR provides partial data for 2016 and identifies effects of TNCs. The 2017 ESPR will provide improved data and assessment of ground access trends.

The most significant change since 2011 is the introduction by the FAA of changes to area navigation (RNAV) procedures. The RNAV program has been implemented throughout the country and its primary purpose is to increase safety and operational efficiency. The implementation of several of these procedures has resulted in concentrations of flight patterns over certain communities and significant increases in noise exposure.

The impact of the RNAV program is emphasized in comment letters received on the 2016 EDR and also during review of specific projects, including the Terminal E Modernization Project (EEA# 15434). Massport and the FAA signed a Memorandum of Understanding (MOU) in 2017 to frame a new process for analyzing opportunities to incrementally reduce noise through changes or amendments to Performance Based Navigation, including RNAV procedures.

The 2016 EDR introduces emissions and noise modeling based on AEDT rather than the Integrated Noise Model (INM). Massport had deferred use of the AEDT until Massport made adjustments.

Subsequent ESPRs and EDRs will document potential impacts and trends and propose measures to avoid, minimize and mitigate environmental impacts.

Review of the 2016 EDR and Scope for the 2017 ESPR

The 2016 EDR identifies passenger activity and aircraft operational levels; provides updates on projects, environmental management plans and the status of project mitigation; includes a description and analysis of changes which will influence results and projections of the 2017 ESPR; and it includes a Scope for the 2017 ESPR.

The 2017 ESPR is an opportunity to update the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts, documented trends and environmental impacts. The next ESPR will analyze calendar year 2017 and provide projections through 2035. It should follow the general format of the 2011 ESPR and include an Executive Summary (translated into Spanish) and Introduction, similar to previous ESPRs and EDRs. A-1 A-2

The 2017 ESPR must include information on the environmental policies and planning that form the context of environmental reporting, technical studies, and environmental mitigation initiatives against which projects at Logan Airport can be evaluated. This should include identification of the cumulative effects of Logan Airport operations and activities, compared to previous years, as appropriate. The results of the Logan Airport Air Passenger Ground Access Survey and the Long-term Parking Management Plan should inform transportation planning and strategies to achieve the HOV mode share goal. A-3 A-4 A-5

The ESPR must include copies of all ESPR and EDR Certificates and a distribution list for the 2017 ESPR (indicating those receiving documents, CDs, or Notices of Availability). Supporting technical appendices should be provided as necessary. A-6 A-7

Response to Comments

The Response to Comments section should address all of the substantive comments on the 2016 EDR, and other Certificates for Logan Airport that reference EDR/ESPR documentation (e.g. Logan Airport Parking Project, Terminal E). To ensure that the issues raised by commenters are addressed, the 2017 ESPR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the 2017 ESPR beyond what has been expressly identified in this Certificate. I recommend that the Massport continue to use the format from the 2016 EDR. The Responses to Comments should not reference a section of the 2017 ESPR unless they are directly responsive to the comment. Common themes that should be addressed throughout the ESPR and in the Responses to Comments include noise (modeling of noise contours and noise abatement) and emissions reduction issues. The 2017 ESPR should include sufficient information to address comments on traffic, air quality and public health which are common concerns of commenters. A-8 A-9 A-10 A-11 A-12

Activity Levels

Air traffic activity levels at Logan Airport are the basis for the evaluation of noise, air quality, and ground access conditions associated with the Airport. In this section, current activity levels at the Airport are compared to prior-year levels, and historical passenger and operations trends at Logan Airport dating back to 2000 which is the year Massport approved an Environmental Management Policy. The total number of air passengers increased by 8.5 percent to 36.3 million in 2016, compared to 33.4 million in 2015. The 2016 passenger level represents a record high for Logan Airport.

Passenger aircraft operations accounted for 90.4 percent of total aircraft operations in 2016. The total number of aircraft operations at Logan Airport increased by 4.9 percent from 372,930 in 2015 to 391,222 in 2016. Aircraft operations continue to increase from 2010 levels and remain below the 487,996 operations in 2000 and the historical peak of 507,449 in 1998.

Air carrier efficiency continued to improve in 2016 as the average number of passengers per aircraft operation at Logan Airport grew from 89.7 in 2015 to 92.8 in 2016. The increasing number of passengers per flight reflects a shift away from smaller aircraft and rising load factors

as airlines continue to focus on capacity control and improvements in efficiency. This trend is indicative of the industry-wide shift toward higher aircraft load factors and an increase in the number of domestic and international destinations. Annual domestic passenger activity levels increased from 27.8 million in 2015 to 29.6 million in 2016, a 6.4 percent increase. International passenger demand continues to increase at a faster rate than domestic passenger demand. International passengers increased from 5.5 million in 2015 to 6.6 million in 2016, a 19 percent increase. The 2016 EDR indicates that strong international passenger growth was driven by the economic attractiveness of the metropolitan Boston region and the strength of Boston as an origin and destination market. In response to regional demand for international service, new non-stop services were introduced by a number of airlines including Air Berlin, Norwegian Air Shuttle, Qatar Airways, Scandinavian Airlines, and TAP Air Portugal. New international destinations from Logan Airport in 2016 included Dusseldorf, London Gatwick, Doha, Copenhagen, and Lisbon.

Passenger activity has continued to grow faster than forecasts provided in the 2016 EDR. It is expected that Logan Airport will reach 40 million annual passengers by 2019. The ESPR should describe how Massport will achieve long-standing goals to reduce overall operating and environmental impacts at the airport as passengers and, in particular, international passengers increase. Discussion of passenger and activity levels and planning/mitigation to address impacts of that growth, in particular air and noise emissions, should be a significant emphasis of the ESPR. A-13 A-14

The 2017 ESPR should report on:

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Domestic and international passenger activity levels;
- Cargo and mail volumes;
- Comparison of 2017 operations and passenger activity levels to 2016 activity levels; and
- National aviation trends compared to Logan Airport trends.

A-15

The 2017 ESPR should update the Logan Airport long-term passenger forecast to reflect growth trends at Logan Airport and revised expectations for the local/national/international economy. Planning and impact sections will be based on forecasting for the next five years through 2035. It should address methodologies and assumptions used in the analysis, including anticipated changes to fleet mix changes and other trends in the aviation industry. It should also provide: A-16 A-17

- Updated forecasts for passenger volume, aircraft operations, and fleet mix;
- A comparison of 2017 operations to historic trends and 2035 forecasts; and
- A comparison of forecast activity levels to Massport forecasts from previous ESPRs, FAA forecasts and the U.S. aviation industry.

A-18

Sustainability at Logan Airport

The 2016 EDR described Massport's airport wide sustainability goals as identified in the EMP and 2016 Sustainability Management Plan (SMP). The SMP identifies efforts to promote,

coordinate and integrate sustainability Airport-wide. Progress towards achieving these goals was addressed in the 2016 EDR. The 2017 ESPR should update progress on these goals. A-19

Climate Change

Massport assets and Logan Airport, in particular, are critical infrastructure and play an important role in the economy. As recognized in Governor Baker's recent Executive Order 569 "Establishing an Integrated Climate Change Strategy for the Commonwealth" and a suite of other state and municipal initiatives, the impacts of climate change must be an important consideration for development across the state. Climate change presents a serious threat to the environment and the Commonwealth's residents, communities and economy. The EO indicates that extreme weather events associated with climate change present a serious threat to public safety and the lives and property of our residences. The recent flooding and storm damage caused by two storms in early March underscore these risks and the importance of adaptation and resiliency planning.

The EO also identifies the transportation sector as a significant contributor to GHG emissions in the Commonwealth and the only sector in which GHG emissions are increasing. In 2017, EEA and the Massachusetts Department of Transportation (MassDOT) conducted a number of transportation listening sessions throughout the Commonwealth to inform development of strategies and programs to reverse the growth in this sector.

Consistent with EO 569, the Massachusetts State Hazard Mitigation and Climate Adaptation Plan and the Massachusetts Energy Plan will be released in September. The ESPR should address the project's consistency with these plans. A-20

Massport has begun reporting on GHG emissions and, in recognition of the potential effects of climate change on Massport infrastructure and operations, Massport initiated a Disaster and Infrastructure Resiliency Planning (DIRP) Study.

GHG emissions

The 2016 EDR contains a greenhouse gas (GHG) emissions inventory for the Logan Airport EDR. The 2016 EDR presented emissions and energy data normalized by passenger use and building area. GHG emissions associated with buildings and transportation were presented as pounds of CO_2 per passenger. GHG emissions for buildings were presented as pounds of CO_2 per sf per year. Energy use for buildings were presented as kBtu per sf per year. Ten years of data was provided in the 2016 EDR for each of these. The analysis showed that Massport has reduced emissions per passenger across its operations by 34 percent in the last decade. Building energy use has been reduced 23 percent while building emissions have been reduced 43 percent.

The 2017 ESPR should incorporate GHG emissions reporting consistent with that provided in the 2016 EDR which was normalized to support effective review and analysis. In addition, Massport should ensure that only conditioned (heated and cooled, enclosed buildings) building areas are included in energy use and emission intensity calculations, report input energy components (oil, gas, electricity) and central plant data and clarify how renewables are A-21 A-22

accounted in the analysis. Massport should consult with the MEPA Office and the Department of Energy Resources (DOER) regarding presentation of GHG data in the 2017 ESPR and subsequent EDRs. A-23

The 2017 ESPR GHG emissions should continue to be quantified for aircraft, GSE, motor vehicles and stationary sources using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (Airport Cooperative Research Program (ACRP) Report 11, Project 02-06). The results of the 2017 GHG emissions inventory should be compared to the 2016 results. A-24

Adaptation and Resiliency

A particular concern for Massport is the effect of sea level rise and projected increases in the severity and frequency of storms. The DIRP Study includes Logan Airport, the Port of Boston, and Massport's waterfront assets in South and East Boston. It includes a hazard analysis; modeling of projected sea-level rise and storm surge; temperature and precipitation projections; and anticipated increases in extreme weather events.

In addition to the DIRP Study and its related initiatives, Massport has completed an Authority-wide risk assessment; issued a Floodproofing Design Guide; and developed a resilience framework to provide consistent metrics for short- and long-term planning and protection of its critical facilities and infrastructure. Massport's Floodproofing Design Guide was updated in April 2016. Plans were also introduced in 2015 that included the deployment of temporary flood barriers to protect up to 12 locations of critical infrastructure in the event of severe weather.

The 2017 ESPR should provide a summary of the DIRP Study and identify which recommendations Massport will implement in the short term and long term. A-25

Mitigation

The 2016 EDR identifies the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review. The 2017 ESPR will address cumulative, Airport-wide impacts. The 2017 ESPR should update the status of mitigation commitments for recent projects such as the Terminal E Modernization Project and the Logan Airport Parking Project as well as projects previously included in the EDRs. A-26 A-27

Planning

The Airport Planning section describes the status of projects underway or completed at Logan Airport by the end of 2016. Specific topics include terminal area projects, service area projects, buffer/open space projects, Airport parking projects, airside area projects, high occupancy vehicle (HOV) improvements, and Airport-wide projects. Project updates include:

- *Terminal E Renovation and Enhancements Project*: This project includes interior and exterior improvements at Terminal E to accommodate regular service by wider and

longer Group VI aircraft. The project reconfigured three gates to accommodate Group VI aircraft (including the Airbus A380 and Boeing 747-8 primarily used by international air carriers) and passenger holdrooms to accommodate larger passenger loads associated with these aircraft. Construction was completed in early 2017.

- *Terminal E Modernization Project*: This project will accommodate existing and long range forecasted demand for international service. The expansion will add the three gates approved in 1996 (International Gateway West Concourse project, EEA #9791), which were never constructed, and an additional two to four additional new gates in an extended concourse. A key feature of this project is the first direct pedestrian connection from the MBTA Blue Line Airport Station to the terminal complex at Logan Airport. It will also include roadway improvements to facilitate access to the terminal. Phase 1 has been permitted and is in the final design stage.

- *Terminal C to E Airside Connector:* This project provides a new post-security connection between Terminals C and E on the Departures Level and provides improved passenger circulation within the post-security concourses, additional holdroom space at Terminal E, reconfigured office space, concessions and concessions support, and a new consolidated location for escalators and stairs. The project was completed in May 2016.

- *Terminal B Airline Optimization Project:* Massport is upgrading its facilities on the Pier B side of Terminal B to meet airlines' needs (primarily reflecting the merger of American Airlines and US Airways) and to provide facilities that improve the passenger traveling experience. Similar improvements have been implemented with the recent renovations and improvements at Terminal B, Pier A. Planned improvements include an enlarged ticketing hall; improved outbound bag area; and expanded bag claim hall, concession areas and holdroom capacity at the gate. Final design is complete and construction is underway. Construction is expected to be complete in early 2019.

- *Hangar Projects:* Architectural design commenced in December 2010 for two hangar upgrades in the North Cargo Area (NCA). The renovated JetBlue Airways hangar opened in 2012. The American Airlines hangar, formerly occupied by Northwest Airlines, was refurbished in 2013. Demolition of the former American Airlines hangar (Hangar 16) commenced in 2014 and was completed in August 2016.

- *Logan Airport Parking Project*: This project includes the construction of up to 5,000 new commercial parking spaces to reduce trip generation associated with increases in passenger drop-off and pick-up at the airport. The Certificate on the ENF was issued on May 5, 2017 and included a Scope for the Draft Environmental Impact Report (DEIR). The project required an amendment to the Logan Airport Parking Freeze Regulations (310 CMR 7.30). Amendments to the regulations were promulgated in 2017. The DEIR is under development and will identify the number of spaces, location of spaces and planned construction phasing.

- *Maintenance of Airport Edge Buffer Areas and Parks:* The 2016 EDR provides updates on the planning, construction, and maintenance of four Airport edge buffer areas and two

parks along Logan Airport's perimeter. As of 2016, the Bayswater Buffer, Navy Fuel Pier Buffer, SWSA Buffer Phase 1 and the SWSA Buffer Phase 2 have been completed. The Neptune Road Airport Edge Buffer opened in 2016. These buffers and parks include 3.3 miles and more than 33 acres of green space developed or managed by Massport.

The 2017 ESPR should continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport must accommodate and guide tenant development. The ESPR should describe the status of planning initiatives for the following areas: A-28

- Roadways and Airport Parking;
- Terminal Area;
- Airside Area;
- Service and Cargo Areas; and
- Airport Buffers and Landscaping. A-29

The 2017 ESPR should also indicate the status of long-range planning activities, including the status of public works projects implemented by other agencies within the boundaries of Logan Airport. A-30 The ESPR should identify the status and assess effectiveness of ground access changes, including roadway and parking projects, that consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on streets in adjacent neighborhoods. A-31

Regional Transportation

The 2016 EDR describes activity levels at New England's regional airports in 2016 and provides an update on regional planning activities, including long-range transportation efforts. The New England region is anchored by Logan Airport and a system of 10 other commercial service, reliever, and general aviation (GA) airports (regional airports). In 2016, passenger traffic at the New England airports represented the highest passenger traffic level for the region since the economic downturn in 2008. The increase in the region's passenger traffic was largely driven by continued growth at Logan Airport. In 2015, the total number of air passengers utilizing New England's commercial service airports, including Logan Airport, increased by 6.4 percent, from 48.8 million air passengers in 2015 to 51.9 million air passengers in 2016. Of the 51.9 million passengers using New England's commercial service airports in 2016, 69.9 percent of passengers (36.3 million) used Logan Airport compared to 68.6 percent (33.5 million) in 2015.

The 2017 ESPR should report on:

Regional Airports

- 2017 regional airport operations, passenger activity levels, and schedule data within an historical context;
- Status of plans and new improvements as provided by the regional airport authorities; A-32
- Role of the Worcester Regional Airport and Hanscom Field in the regional aviation system and Massport's efforts to promote these airports; and

- Ground access improvements at Massachusetts Regional Airports.

Regional Transportation System

- Massport's role in managing the regional transportation facilities within MassDOT;
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership. A-32

Ground Access to and from Logan Airport

The 2016 EDR reports on transit ridership, roadways, traffic volumes, and parking for 2016. Specifically, the EDR states that Massport has continued to invest in and operate Logan Airport with a goal of increasing the number of passengers arriving by transit or other HOV modes. The 2016 EDR provides a discussion of ground access modes and trip generation associated with each mode including: (1) transit and shared-ride HOV services; (2) drive to Logan Airport and park; or (3) drop-off/pick-up mode, which can involve a private vehicle, taxi, limousine, or TNCs.

Use of mobile application ride-booking services, such as Uber and Lyft, are increasingly becoming a mode of choice for ground access at Logan Airport. As noted previously, in 2017 Massport began allowing TNCs to pick-up arriving air passengers. The 2016 EDR provides data from the 2016 Logan Airport Air Passenger Ground-Access Survey that shows increased use.

Massport remains in compliance with the Parking Freeze regulations which regulates the number of commercial and employee parking spaces allowed at Logan Airport. Massport submits semi-annual compliance filings to MassDEP; March and September reports are provided in the 2016 EDR. As permitted (and encouraged) by the regulations, Massport has converted employee spaces to commercial spaces, within the overall limits.

The HOV/transit mode share at Logan Airport continues to rank at the top of U.S. airports. The 2016 EDR describes a multi-pronged trip reduction strategy to reduce the number of private vehicles that access Logan Airport and, in particular, the drop-off/pick-up modes. Measures implemented in 2016 by Massport to increase HOV use include a blend of initiatives related to pricing (incentives and disincentives), service availability, service quality, marketing, and traveler information.

At the same time, private passenger vehicle trips continue to increase as air travel grows. Massport has indicated that as passenger levels have increased, the constrained parking supply at Logan Airport has resulted in an increase in pick-up and drop-off vehicle trips. Despite an increase in terminal area parking rates on July 1, 2014, daily parking demand more frequently approached the Parking Freeze cap in 2015. As described previously, Massport is proposing to construct additional parking to reverse this trend. The 2016 EDR contained an outline of the proposed ground access study required by the Parking Freeze amendments. The results recommendations of this study will be presented in the 2017 ESPR. A-33

Beginning with the 2017 ESPR, Massport will introduce a new definition for high occupancy vehicle (HOV) modes that will provide more accuracy. Under the current system, Massport identifies all taxis as non-HOV and TNCs as non-HOV and all black car limousines as HOV. Going forward, Massport will estimate HOV and non-HOV breakdowns for taxis, livery services, and TNCs based on whether there is more than one passenger. Consistent with the directive identified in the Certificate on the ENF for the Logan Airport Parking Project, and through negotiations with CLF, Massport has committed to a goal of 35.5 percent HOV by 2022 and 40 percent by 2027. A-34

The Airport-wide Automated Traffic Monitoring System (ATMS) includes permanent traffic count stations at the Airport's gateway roadways. These stations provide data on annual average daily traffic (AADT), annual average weekday daily traffic (AWDT), and annual average weekend daily traffic (AWEDT). The AADT (entering and departing Logan Airport) increased by increased by 5.4 percent between 2015 and 2016. The change in average daily traffic can be attributed to: an 8.5-percent increase in air passenger activity in 2016; a 5.1-percent increase in taxi dispatches in 2016; and, the impact of TNCs (although this has not been quantified).

On-Airport VMT is calculated based on the total number of miles traveled by all vehicles within the Logan Airport roadway system. VMT is used to calculate motor vehicle air quality emissions, and it is also one indication of the levels of traffic on roadways in specific areas and at specific times. In 2011 as detailed in the 2011 ESPR, Massport upgraded its modeling capabilities and began using an on-Airport VISSIM-10 model to estimate VMT. The adjustment factors for the 2016 VMT calculations were determined by using 2011 to 2016 gateway, airport roadway, and parking volume averages.

The change in average weekday VMT between 2015 and 2016 was approximately 4.8 percent, despite higher increases in passenger levels (8.5 percent) and traffic volume (5.4 percent) during the same time period. Since 2000, the highest average weekday VMT estimated at Logan Airport was 184,613 in 2007. According to the 2016 EDR weekday VMT calculations remain about 4.4 percent lower than 2007, despite the 29.1 percent increase in air passenger traffic during the same time period. The 2016 EDR attributes this to the promotion of HOV modes. However, the 2016 EDR does not present a quantifiable comparison between VMT values prior to 2011 because the previous model was limited to terminal access roads while the current VMT model includes a larger on-Airport study area.

The 2016 EDR describes improvements to support HOV access which include: Back Bay Logan Express pilot service (since May 2014); free MBTA Silver Line outbound (from Logan Airport) boardings; a 1,100-car parking garage at the Framingham Logan Express; reduced holiday travel parking rates at Logan Express facilities; increased parking rates on the Airport; and support for private coach bus and van operators. In 2015, Massport acquired the 20-acre site that Massport previously leased for Braintree Logan Express. The site provides parking for 1,800 cars. The Braintree had a ridership of 655,158 passengers trips in 2016, representing 36 percent of the entire Logan Express system ridership. Approximately half of the Braintree Logan Express riders are Logan Airport employees. 2016 ridership for the Back Bay Logan Express totaled 216,329 passengers, an average of about 600 riders per day. In 2015, the service average

was 805 riders per day, with a total of 290,796 passengers. The EDR attributes the 26 percent reduction in ridership to the re-opening of the Government Center Station in March 2016 and the ending of free fares for riders with an MBTA pass and reduced fares for all others.

The 2017 ESPR should report on 2017 ground access conditions at the airport and provide a comparison to 2016 for the following:

- Description of compliance with Logan Airport Parking Freeze;
- High-occupancy vehicle (HOV) ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express);
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport vehicle miles traveled (VMT);
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning;
- Results of the 2016 Logan Airport Air Passenger Ground Access Survey; and,
- Status of proposed connector to the Airport Station associated with the planned Terminal E Modernization Project.

A-35

The chapter should present a discussion of analytical methodologies and assumptions for the planning horizon year (2035) for traffic volumes, on-airport VMT and parking demand. A-36

The 2017 ESPR should address the following topics:

- Target HOV mode share and incentives;
- Non-Airport through-traffic;
- Cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Silver Line, Water Transportation, and Logan Express;
- Report on efforts to increase capacity and use of Logan Express;
- Progress on enhancing water transportation to and from Logan Airport;
- Results and recommendations of the ground access study Long-term Parking Management Plan required by the Parking Freeze amendments; and
- Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.

A-37

<u>Noise</u>

The 2016 EDR updated the status of the noise environment at Logan Airport in 2016, and described Massport's efforts to mitigate noise exposure and impacts. The implementation of the aRea NAVigation (RNAV) Pilot study being jointly undertaken by FAA and Massport has resulted in concentration of flight patterns over certain communities and significant increases in noise exposure. The effects of this program are identified as significant concerns in the majority of comment letters.

The 2016 EDR provides noise modeling results from the AEDT (version 2c, Service Pack 2). The model requires detailed operational data as inputs for noise calculations, including numbers of operations per day by aircraft type and by time of day, which runway for each arrival and for each departure, and flight track geometry for each track. INM results are provided for comparison. The 2016 EDR also presents summaries of the 2016 operational data used in the noise modeling, as well as the resultant annual Day-Night Average Sound Level (DNL) noise contours, a comparison of the modeled results with measured levels from the noise monitoring system, and estimates of the population residing within various increments of noise exposure in 2016. Both FAA and the U.S. Department of Housing and Urban Development consider DNL exposure levels above 65 decibels (dB) to be incompatible with residential land use. The 2016 EDR identifies which noise abatement measures are being employed, describes the RNAV Pilot study being jointly undertaken by FAA and Massport, and provides a summary of the Boston Logan Airport Noise Study (BLANS).

Annual aircraft operations in 2016 increased from 372,930 operations in 2015 to 391,222 in 2016, a 4.9-percent increase. Passenger volumes are at an all time high increasing from 33.4 million passengers in 2015 to 36.3 million in 2016, an increase of 8.5 percent. Commercial traffic increased from 344,764 to 360,400, a 4.2-percent increase compared to 2015. In 2016, operations continued to shift from the smaller Regional Jet (RJ) aircraft to larger aircraft on many routes, increasing the number of passengers carried per operation.

Differences between measured and modeled values had narrowed in recent years as the processes were refined. Introduction of the AEDT has increased the differences. Runway use changes from 2015 to 2016 were the largest factor influencing noise exposure in 2016. The one-month closure of Runway 4L-22R for resurfacing caused air traffic to shift to Runway 15R-33L and Runway 9-27, and these changes in runway use are reflected in the noise contour changes presented in the 2016 EDR. An additional factor influencing noise contour changes in 2016 was an increase in nighttime operations, from 50,786 in 2015 to 55,499 in 2016.

Population exposed to DNL levels greater than or equal to DNL 65 dB noise levels for 2016 was 16,985 based on the legacy INM model, and 7,450 using the next-generation AEDT model. In 2016, noise complaints more than doubled. Massport received 38,045 noise complaints from 83 communities compared to 17,685 in 2015 from 84 communities.

The increase in complaints continues to be primarily related to the FAA's RNAV departure procedures, which concentrate flight tracks along narrower corridors. All complaints have been forwarded to FAA. The 2016 EDR also provides an update on the MOU between Massport and FAA to frame the process for analyzing opportunities to reduce noise through changes or amendments to Performance Based Navigation (PBN), including RNAV. Massport is working with the FAA to develop test projects designed to help address the concentration of noise from the PBN. The 2017 ESPR must provide strategies to address noise impacts which are expressed in numerous comments received on the 2016 EDR. A-38

To date, Massport has provided sound insulation for a total of 11,515 residential units exposed to levels greater than or equal to DNL 65 dB, and will continue to seek funding for sound insulation for properties that are eligible and whose owners have chosen to participate. The 2017 ESPR should provide an overview of the environmental regulatory framework A-39

affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2017 conditions and provide a comparison to 2016 for the following: A-39

- Fleet Mix, including Stage II, Recertified Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft;
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals);
- Preferential runway advisory system (PRAS) tracking; and
- Flight tracks. A-40

The 2017 ESPR should report on the following:

- Changes in annual noise contours and noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed;
- Cumulative Noise Index (CNI);
- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and
- Flight track monitoring noise reports. A-41

The 2017 ESPR should also report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) study, and provide an update on the noise and operations monitoring system. A-42

Air Quality/Emissions Reduction

The 2016 EDR provided an overview of airport-related air quality issues in 2016 and efforts to reduce emissions. The air quality modeling is based on aircraft operations, fleet mix characteristics, and airfield taxiing times combined with ground support equipment (GSE) usage, motor vehicle traffic volumes, and stationary source utilization rates. Total air quality emissions from all sources associated with Logan Airport are significantly lower than a decade ago.

In 2016, calculated emissions of volatile organic compounds (VOCs), oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM) went up slightly compared to 2015. The increase is primarily due to the corresponding increase in aircraft landing and take offs (LTOs), airfield taxi times, and modeling differences between the AEDT model and the Emissions Dispersion Modeling System (EDMS) which had been used in prior EDR filings. VOC, NOx, CO and PM were all is influenced by the increase in aircraft operations. In addition, the AEDT model estimates growth in the proportion of aircraft emissions for VOCs, NOX, and CO in comparison to EDMS. However, the opposite was true for PM10/ PM 2.5 where the EDMS model estimates a higher PM10/ PM 2.5 than the AEDT model. Total modeled emissions of VOCs increased by 7.7 percent in 2016 to 1,280 kilograms (kg)/day, compared to 1,188 kg/day in 2015. Modeled NOx emissions increased by 24.4 percent in 2016 to 5,300 kg/day compared to 4,262 kg/day in 2015. Total modeled CO emissions increased by 1.5 percent in

2016 to 7,350 kg/day compared to 7,243 kg/day in 2015. Total PM10/PM2.5 emissions have decreased by about 2 percent in 2016 to 96 kg/day from 98 kg/day in 2015.

The 2017 ESPR should contain an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The 2017 ESPR should also provide discussion on progress on the national and international levels to decrease air emissions. Massport should continue to use the FAA's AEDT model for air emissions modeling as was presented in the 2016 EDR. A-43 A-44 A-45

The EPA Motor Vehicle Emission Simulator (MOVES) tool will continue to be used to assess vehicular emissions on airport roadways. The 2017 ESPR should include a mobile sources emissions inventory for CO, NOx, VOCs, and PMs. It should also report on Massport and tenant alternative fuel vehicle programs and the status of Logan Airport air quality studies undertaken by Massport or others, as available. A-46 A-47

Commenters continue to express concern regarding ultrafine particulates (UFPs). The 2016 EDR includes information on the status of UFP review by the Environmental Protection Agency (EPA) and an update on associated research and monitoring. The ESPR should include updated information regarding potential regulation, research and monitoring of UFPs. A-48

Massport should also provide an update on its efforts to encourage the use of single engine taxiing under safe conditions. In addition, the 2017 ESPR should provide an update on the feasibility of combined heat and power (CHP) use for Terminal E and updates to progress made in designing the energy systems for the facility. A-49 A-50

Water Quality/Environmental Compliance

The 2016 EDR describes Massport's ongoing environmental management activities including National Pollutant Discharge Elimination System (NPDES) compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management. Massport's primary water quality goal is to prevent or minimize pollutant discharges, thus limiting adverse water quality impacts of airport activities. Massport employs several programs to promote awareness of activities that may impact surface and groundwater quality. Programs include implementing best management practices (BMPs) for pollution prevention by Massport, its tenants, and its construction contractors; training of staff and tenants; and a comprehensive stormwater pollution prevention plan.

The 2017 ESPR should identify any planned stormwater management improvements and report on the status of: A-51

- NPDES Permit and monitoring results for Logan outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- MCP activities;
- Tank management;
- Update on the environmental management plan; and
- Fuel spill prevention.

Conclusion

Massport may prepare a 2017 ESPR for submission consistent with the Scope included in this Certificate. I encourage Massport to target early 2019 for filing of the 2017 ESPR.

August 10, 2018
Date

Matthew A. Beaton

Comments received:

06/17/2018	Gillian Anderson
06/18/2018	Luke Preisner
06/21/2018	James Morgan
06/22/2018	Nancy Timmerman
07/02/2018	Peter Houk
07/23/2018	Town of Milton, Board of Selectmen
07/31/2018	Cindy Christiansen
07/31/2018	GreenRoots
07/31/2018	Astrid Weins
07/31/2018	Dawn Quirk and Julia Wallerce
07/31/2018	Airport Impact Relief, Inc.
08/03/2018	Department of Energy Resources

MAB/ACC/acc

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

February 17, 2017

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
2015 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2015 Environmental Data Report
PROJECT MUNICIPALITY	: Boston/Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: December 21, 2016

As Secretary of Executive Office of Energy and Environmental Affairs (EEA), I hereby determine that the Environmental Data Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA) (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

The environmental review process for Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of the Massachusetts Port Authority's (Massport) long-range planning process. The ESPR provides a "big picture" analysis of the environmental impacts of current and anticipated levels of activities, and presents an overall strategy to minimize impacts. The ESPR is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments for project-specific Environmental Impact Reports (EIR). The ESPR is generally updated on a five-year basis; the most recent ESPR for the year 2011 was filed in April of 2013. Environmental Data Reports (EDRs) (formerly referred to as Annual Updates) are filed in the years between ESPRs.

Through these reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment on cumulative impacts. This regular updating and reporting on planning and cumulative impacts is unique among State Agencies. It reflects the challenge and complexity of managing and modernizing Logan Airport within a dense, urban area. It recognizes that the proximity of communities to the Airport warrants an enhanced level of public engagement and a concerted, long-term effort to minimize and mitigate impacts.

The 2015 EDR is the subject of this review and includes the Scope for the 2016 ESPR. The 2016 ESPR is an opportunity to update the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts. The 2016 ESPR will document trends and environmental impacts and will update and revise environmental management plans to address impacts. The next ESPR will analyze calendar year 2016 and provide projections through 2035. A-1 A-2

Subsequent ESPRs and EDRs will also update the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts and will update and revise environmental management plans to address impacts. Future submittals will continue to document potential impacts and trends and propose measures to implement the broad goal of maintaining or reducing Logan's overall environmental impacts, even as annual passenger volumes rise. I would like to acknowledge Massport's concerted outreach effort over the last year, including the creation of the Logan Airport Impact Advisory Group (IAG) to solicit comment and to identify and prioritize projects and programs of significance to the IAG.

The 2015 EDR provides a comprehensive, cumulative analysis of the effects of all Logan Airport activities based on actual passenger activity and aircraft operational levels, provides updates on projects, environmental management plans and the status of project mitigation. The 2016 ESPR will report on updated passenger activity levels, aircraft operations forecasts, and environmental conditions forecasts. A-3

Review of the 2015 EDR and
Scope for the 2016 ESPR

In 2015, Logan Airport served an all-time high of 33.4 million passengers, exceeding the 2014 historic peak. A significant portion of growth in passengers is driven by an increase in demand for international air service. Massport has provided new service to international destinations and expandined service to existing destinations. As passenger levels have increased, aircraft operations remain significantly below the peak of 507,449 operations experienced in 1998 when Logan Airport served 26.5 million passengers.

The long-term trend is towards more efficient operations and reductions or limited increases in overall environmental impacts. Although environmental impacts are significantly lower compared to 1998 when operations were highest, comparison of activity level and environmental impact data to 2014 and more recent EDRs identifies increases in noise exposure and air emissions. These increases were not forecast in the 2011 ESPR. The increases are associated with passenger growth, changes in flight patterns and changes in modeling of noise and air quality. A significant impact since 2011 is the introduction by the Federal Aviation Administration (FAA) of changes to area navigation (RNAV) procedures. The RNAV program has been implemented throughout the country and its primary purpose

is to increase safety and operational efficiency. The implementation of several of these procedures have resulted in concentration of flight patterns over certain communities and significant increases in noise exposure.

The impact of the RNAV program on communities and individuals is clearly reflected in the many comment letters received on the EDR and received during review of specific projects, including the Terminal E Modernization Project (EEA# 15434). In addition, the 2015 EDR indicates that noise complaints have grown significantly. I have received comment letters from elected officials including U.S. Senator Elizabeth Warren, the City of Quincy's Office of Council, and the Milton Office of Selectmen); the Logan Airport Community Advisory Committee; environmental advocacy groups; businesses; and residents. Massport and the FAA recently signed a Memorandum of Understanding (MOU) to frame a process for analyzing opportunities to incrementally reduce noise through changes or amendments to Performance Based Navigation (PBN), including RNAV procedures. I commend Massport and the FAA for establishing this agreement and committing to coordinate to address the impact of the RNAV program on citizens and communities. Massport has indicated that this process will incorporate community outreach and public input. This effort should be a significant focus of the 2016 ESPR. A-4

In addition to noise impacts and abatement, traffic and air quality are common concerns of commenters. Several commenters express continued concern with the effects of ultrafine particulates (less than 100 nanometers in diameter) which are associated with transportation sources, including aviation. Massport has proposed that the Massachusetts Department of Environmental Protection (MassDEP) amend the Logan Airport Parking Freeze Regulation (310 CMR 7.30) so that Massport may increase on-airport parking. Massport has proposed increasing its parking supply, if the regulations are amended, to reduce trip generation associated with increases in passenger drop-off and pick-up at the airport. Commenters are concerned that the lifting of the Parking Freeze will lead to increases in long-term growth in traffic and congestion. I expect the data provided in the 2015 EDR will inform any project-specific review which would include review of potential environmental impacts and of project-specific impact avoidance, minimization, and mitigation measures. I note that commenters have requested to review data that supports Massport's assertion including data from its parking survey. A-5 A-6

The EDR includes a significant amount of information and data which can be analyzed to understand historical conditions and trends as well as compare data on an annual basis or to significant milestones or benchmarks. For instance, the EDR identifies and refers to 1998 because it represents the maximum number of operations, references 2000 because that marks the beginning of a concerted effort to identify and track sustainability indicators to guide programs and mitigation, and references 2008-9 because of the economic recession and its associated effect on activity levels. Equally important to monitoring and historical data, are projections to understand how past or existing trends may affect future conditions. The 2011 ESPR projected year was 2030 and the 2016 ESPR projected year will be 2035. Many of the comments received question the relevance of comparison to certain years, assert that too much emphasis has been placed on historical trends rather than recent increases in certain indicators, and/or question the accuracy of data analysis. Massport has responded to comments regarding data in the past by improving the organization, content and presentation of data and analysis of the ESPR and EDR. The 2014 EDR in particular was a significant improvement and the 2015 EDR continues this trend.

The 2015 EDR identifies additional data collection and identifies changes in modeling programs that are designed to more accurately estimate impacts but may produce different results based on same inputs (i.e. a decrease in emissions could result from a change in modeling rather than an actual reduction in emissions). Also Massport has expanded its reporting on greenhouse gas (GHG) emissions to include tenants and ground access passenger vehicles as well as indirect sources.

The FAA Aviation Environmental Design Tool (AEDT) which was introduced in 2015 is a significant change in modeling of noise and air quality. FAA is requiring airports to use AEDT for National Environmental Policy Act (NEPA) review projects and soundproofing eligibility. The tool models aircraft performance in space and time to produce fuel burn, emissions, and noise information. The EDR indicates that Massport initiated modeling with AEDT but had concerns that it did not accurately reflect the noise environment at Logan Airport. Massport consulted with FAA and determined that the AEDT results would not be published in the 2015 EDR. Massport is evaluating the new model and working with the FAA to develop the types of Logan Airport specific adjustments for the AEDT model that have been used for many years in the Integrated Noise Model (INM). Massport has requested that the FAA consider and approve these adjustments and indicates that, if completed in a timely fashion, AEDT modeling results would be presented in the 2016 ESPR. A-7

Based on significant changes in operations, modeling and data collection, the 2016 EDR provides an opportunity to reconsider data collection, presentation and analysis. I expect Massport will consider the many thoughtful comments provided on these issues and will provide a comprehensive analysis of these significant changes (e.g. RNAV, AEDT) and results and projections may be influenced by them. A-8

General

The 2016 ESPR should follow the general format of the 2011 ESPR, presenting major policy discussions and an overview of the role of Logan Airport in the regional planning context. This should be followed by a status report on Massport's planning initiatives, projects, and mitigation measures. The ESPR should include an Executive Summary and Introduction, similar to previous ESPRs and EDRs. Massport must provide necessary background information to allow reviewing agencies and the public to understand the environmental policies and planning which form the context of the environmental reporting, technical studies, and environmental mitigation initiatives at Logan Airport. Some commenters acknowledged Massport's efforts to increase outreach and resources, including providing translation at meetings and translation of the EDR Executive Summary into Spanish. A-9 A-10 A-11

The 2016 ESPR should report on updated passenger and operations activity forecasts for Logan Airport, Hanscom Field and Worcester Regional Airport. The new forecast used should begin with 2016 as the base year and project activity forecasts forward to calendar year 2035. In addition, the 2016 ESPR will use the results of the 2016 Logan Airport Air Passenger Ground Access Survey and the Long-term Parking Management Plan to inform transportation planning. A-12 A-13

The technical studies in the 2016 ESPR should include reporting on and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking. The 2016 ESPR must also respond to issues explicitly noted in this Certificate and the comments received on the 2015 EDR. A-14 A-15

A distribution list for the 2016 ESPR (indicating those receiving documents, CDs, or Notices of Availability) should be provided in the document. This section must also include copies of all ESPR and EDR Certificates issued since the 2011 Logan ESPR to provide context for reviewers. Supporting technical appendices should be provided as necessary. A-16 A-17 A-18

Responses to Comments

To ensure that the issues raised by commenters are addressed, the 2016 ESPR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the 2016 ESPR beyond what has been expressly identified in this Certificate. I recommend that Massport continue to use the format from the EDR; however, it should limit references to a section of the 2016 ESPR unless they are directly responsive to the comment. Common themes that should be addressed throughout the ESPR and in the Responses to Comments include noise modeling, contours and abatement. The 2016 ESPR should include sufficient information to address comments on traffic and air quality. Massport should consult directly with individual commenters as appropriate. A-19 A-20 A-21 A-22

Activity Levels

This section reports on annual air traffic activity at Logan Airport in 2015, including air passengers, aircraft operations, aircraft fleet mix, and cargo volumes. Air traffic activity levels at Logan Airport are the basis for the evaluation of noise, air quality effects, and ground access conditions. In this section, current activity levels at the Airport are compared to prior-year levels, and historical passenger and operations trends at Logan Airport dating back to 2000 which is the year Massport approved an Environmental Management Policy. The total number of air passengers increased by 5.7 percent to 33.4 million in 2015, compared to 31.6 million in 2014. As noted previously, the 2015 passenger level represents a record high for Logan Airport.

Passenger aircraft operations accounted for 91 percent of total aircraft operations in 2015. The total number of aircraft operations increased from 363,797 in 2014 to 372,930 in 2015, a 2.5-percent increase. This was preceded by a 0.7 percent increase from 2013 to 2014. Operations are increasing compared to previous years; however, aircraft operations at remained below the 487,996 operations in 2000 and the historical peak of 507,449 achieved in 1998. In 1998, Logan Airport served 26.5 million air passengers, compared to 33.4 million in 2015, which saw 134,519 fewer operations.

Air carrier efficiency continued to improve in 2015 as the average number of passengers per aircraft operation at Logan Airport grew from 87.0 in 2014 to 89.7 in 2015. While the number of domestic and international passengers is increasing, international passenger demand is projected to increase at a faster rate than domestic passenger demand. Annual domestic passengers' activity levels increased from 26.5 million in 2014 to 27.8 million in 2015, a 4.8-percent increase. Total international passengers at Logan Airport increased from 5.0 million in 2014 to 5.5 million in 2015, a 10.9-percent increase. International passengers made up approximately 16.1 percent of total Airport passengers in 2015, and this is projected to increase steadily to nearly 20 percent of the total by 2030 or sooner. The strong international passenger growth was driven by the economic attractiveness of the metropolitan

Boston region and the strength of Boston as an O&D market. New international destinations from Logan Airport in 2015 included Mexico City, Hong Kong, Tel Aviv, and Shanghai.

The 2016 ESPR should report on airport activity levels and aircraft operations, including:

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Domestic and international passenger activity levels;
- Cargo and mail volumes;
- Compare 2016 aircraft operations, cargo/mail operations, and passenger activity levels to 2015 activity levels; and
- Report on national aviation trends in 2016 and compare to trends at Logan Airport.

A-23

It should report on forecasting upon which planning and impact sections will be based for the next five years. Future year analyses should be based on the 2035 forecast. It should update the aircraft operations and passenger activity forecasts, and provide a discussion of analysis methodologies and assumptions, including anticipated fleet mix changes and other trends in the aviation industry. It should also provide:

- A comparison of 2016 operations to historic trends and 2035 forecasts;
- Updated forecasts of Logan Airport's passenger volume, aircraft operations, and fleet mix; and
- A comparison of forecast activity levels to Massport forecasts, FAA forecasts and the U.S. aviation industry.

A-24

Sustainability at Logan Airport

The 2015 EDR describes Massport's airport wide sustainability goals as identified in its Environmental Management Policy (EMP) and 2015 Sustainability Management Report (SMR). The SMR identifies efforts to promote, coordinate and integrate sustainability Airport-wide. A baseline data assessment was completed in winter 2014 to assess current sustainability performance at the Airport.

The 2015 EDR reports its progress towards achieving each goal. Massport revised its Sustainable Design Standards and Guidelines (SDSG) in March 2011 which provide a framework for sustainable design and construction for both new construction and rehabilitation projects. Since 2000 Massport has been striving to achieve certification by the U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) for new and substantial rehabilitation of building projects over 20,000 square feet (sf). The Rental Car Center in the Southwest Service Area was certified at the LEED Gold level and the Green Bus Depot was certified at the LEED Silver level.

Progress on the EMP should be incorporated into subsequent EDRs and ESPRs. A-25

Climate Change

Massport assets including Logan Airport are critical elements of the State's infrastructure and economy. As recognized in Governor Baker's recent Executive Order 569 "Establishing an Integrated Climate Change Strategy for the Commonwealth" and a suite of other state and municipal initiatives, the impacts of climate change must be an important consideration for development across the state. The EO

indicates that climate change presents a serious threat to the environment and the Commonwealth's residents, communities and economy. It indicates that extreme weather events associated with climate change present a serious threat to public safety and the lives and property of our residences. In addition, it indicates that the transportation sector continues to be a significant contributor to GHG emissions in the Commonwealth and is the only sector in which GHG emissions are increasing.

The 2015 EDR contains a greenhouse gas (GHG) emissions inventory for Logan Airport. Data is presented in units of million metric tons. It indicates that, in 2015, total GHG emissions grew by 6 percent due to aircraft operations and taxi times. Analysis of emissions has been expanded from a focus on direct sources associated with Massport assets and facilities to incorporate emissions associated with tenants and transportation and include indirect emissions for all sources.

Massport has indicated that it will continue to report on GHG emissions in 2016 and will quantify aircraft, ground service equipment (GSE), motor vehicles and stationary sources using emission factors and methodologies outlined in the EEA GHG Policy and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (Airport Cooperative Research Program (ACRP) Report 11, Project 02-06) and other relevant guidance. The expansion of GHG reporting is significant and will guide Massport efforts to achieve sustainability goals and GHG emission reduction goals. The presentation of the data could be improved, for instance, by normalizing data and/or reporting emissions in several units (e.g. MMT and tpy) to allow comparisons between various programs, policies and reporting requirements. Massport controlled emissions and tenant emissions, for instance, could be reported in kBtu/sf-yr by building for benchmarking purposes. Identification of total GHG emissions associated with buildings and fuel sources would be informative. I encourage Massport to consider make this a focus for the 2016 ESPR. In addition, I encourage Massport to consider establishment of aggressive goals for reducing GHG emissions, and in particular transportation emissions, in the 2016 ESPR. The ESPR should describe analysis methodologies and assumptions to develop the 2016 ESPR emissions inventory and provide forecasts for 2035. The results should be compared to 2015.

A-26
A-27
A-28
A-29
A-30

In recognition of the potential effects of climate change on Massport infrastructure and operations, the Disaster and Infrastructure Resiliency Planning (DIRP) Study was initiated. A particular concern for Massport is the effect of sea level rise and projected increases in the severity and frequency of storms. The Study includes Logan Airport, the Port of Boston, and Massport's waterfront assets in South and East Boston. The DIRP Study includes a hazard analysis; modeling of projected sea-level rise and storm surge; and, temperature and precipitation projections and anticipated increases in extreme weather events. The study is nearing completion. I note that information from the Study has been incorporated into project-specific reviews. The 2016 ESPR should provide a summary of the DIRP Study and identify which recommendations Massport will implement in the short term to increase the resiliency of its facilities to the potential effects of climate change.

A-31

Mitigation

The 2015 EDR identifies the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review. The 2016 ESPR and future EDRs will continue to be the forum to address cumulative, Airport-wide impacts. The 2016 ESPR should update

A-32
A-33

the status of Massport's mitigation commitments for the Terminal E Modernization Project and report on projects previously included in the EDRs.

A-33 Cont.

Planning

The Airport Planning section describes the status of projects underway or completed at Logan Airport by the end of 2015 and provides updates for projects in progress. Specific topics include terminal area projects, service area projects, buffer/open space projects, Airport parking projects, airside area projects, high occupancy vehicle (HOV) improvements, and Airport-wide projects. It also describes known future planning, construction, and permitting activities.

It includes the following Airport Projects:

- *Terminal E Renovation and Enhancements Project*: This project includes interior and exterior improvements at Terminal E to accommodate regular service by wider and longer Group VI aircraft. The project does not include any new gates, but will reconfigure three existing gates to accommodate Group VI aircraft (including the Airbus A380 and Boeing 747-8 primarily used by international air carriers). An addition to the west side of Terminal E will allow passenger holdrooms to be reconfigured to accommodate the larger passenger loads associated with larger aircraft. The project also includes modifications to the airfield to meet required FAA safety and design standards to accommodate the larger aircraft. Construction commenced in 2015.

- *Terminal E Modernization Project*: This is proposed to accommodate existing and long range forecasted demand for international service. The expansion will add the three contact gates approved in 1996 as part of the International Gateway West Concourse project (EEA #9791), which were never constructed, and an additional two to four additional new gates in an extended concourse. A key feature of this project is the first direct pedestrian connection from the MBTA Blue Line Airport Station to the terminal complex at Logan Airport. It will also include improvements to Airport roadways to facilitate access. The project underwent MEPA review in 2016. Massport intends to commence construction prior to 2018.

- *Terminal C to E Connector:* The Terminal C to E Connector provides a new post-security connection between Terminals C and E on the Departures Level. Approximately 18,900 sf were made to the existing building, and 3,500 sf of new exterior construction. The connector provides improved passenger circulation within the post-security concourses, additional holdroom space at Terminal E, reconfigured office space, concessions and concessions support, and a new consolidated location for escalators and stairs. The project was completed in May 2016.

  Terminal B Airline Optimization Project: Massport is upgrading its facilities on the Pier B side of Terminal B to meet airlines' needs (primarily reflecting the merger of American Airlines and US Airways) and to provide facilities that improve the passenger traveling experience. Similar improvements have been implemented with the recent renovations and improvements at Terminal B, Pier A. Planned improvements include an enlarged ticketing hall, improved outbound bag area, expanded bag claim hall, expanded concession areas, and expanded holdroom capacity at the gate.

The 2016 ESPR should continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport must accommodate and guide tenant development. The ESPR should describe the status of planning initiatives for the following areas:

- Roadways and Airport Parking;
- Terminal Area;
- Airside Area;
- Service and Cargo Areas; and
- Airport Buffers and Landscaping.

A-34

The 2016 ESPR should also indicate the status of long-range planning activities, including the status of public works projects implemented by other agencies within the boundaries of Logan Airport. The ESPR should also indicate the status and effectiveness of ground access changes, including roadway and parking projects, that consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on streets in adjacent neighborhoods.

A-35

A-36

Regional Transportation

The 2015 EDR describes activity levels at New England's regional airports in 2015 and provides an update on regional planning activities, including long-range transportation efforts. The New England region is anchored by Logan Airport and a system of 10 other commercial service, reliever, and general aviation (GA) airports (regional airports). Overall, passenger traffic at the New England airports in 2015 represented the highest passenger traffic level for the region since the economic downturn in 2008 and exceeding the historical peak of 48.0 million in 2005. The increase in the region's passenger traffic was largely driven by continued growth at Logan Airport. In 2015, the total number of air passengers utilizing New England's commercial service airports, including Logan Airport, increased by 4.1 percent from 46.8 million annual air passengers in 2014 to 48.7 million in 2015. Of the 48.7 million passengers using New England's commercial service airports in 2015, 68.6 percent of passengers (33.4 million) used Logan Airport compared to 67.6 percent (31.6 million) in 2014. While passenger activity levels have increased, aircraft operations in the New England region remained flat in 2015, increasing 0.3 percent from 987,652 operations in 2014 to 991,041 operations in 2015. The 2016 ESPR should report on the issues identified below.

Regional Airports

- 2016 regional airport operations, passenger activity levels, and schedule data within an historical context;
- Status of plans and new improvements as provided by the regional airport authorities;
- Role of the Worcester Regional Airport and Hanscom Field in the regional aviation system and Massport's efforts to promote these airports; and
- Ground access improvements at Massachusetts Regional Airport.

A-37

Regional Transportation System

- Massport's role in managing the regional transportation facilities within MassDOT;
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and

A-38

- Report on metropolitan and regional rail initiatives and ridership.

A-38 Cont.

Ground Access to and from Logan Airport

The 2015 EDR reports on transit ridership, roadways, traffic volumes, and parking for 2015. Massport continues to be in full compliance with the Logan Airport Parking Freeze regulations (310 Code of Massachusetts Regulations 7.30) which regulates the number of commercial and employee parking spaces allowed at Logan Airport (total limit of 21,088). The Parking Freeze is included in the Massachusetts State Implementation Plan (SIP) to achieve compliance with the Clean Air Act (42 U.S.C. §7401 et seq. [1970]). Massport submits semi-annual compliance filings to MassDEP; March and September reports are provided in the 2015 EDR. As permitted (and encouraged) by the Parking Freeze provisions, Massport has converted employee spaces to commercial spaces, within the overall limits.

The EDR states that Massport has continued to invest in and operate Logan Airport with a goal of increasing the number of passengers arriving by transit or other high occupancy vehicle (HOV) modes. The HOV/transit mode share at Logan Airport continues to rank at the top of U.S. airports. The 2015 EDR identifies improvements to increase HOV/transit mode share including introduction of the Back Bay Logan Express pilot service (since May 2014); free boardings from Logan Airport to the MBTA Silver Line outbound; construction of a 1,100-car parking garage at the Framingham Logan Express; reduced holiday travel parking rates at Logan Express facilities; increased parking rates on the Airport; and support for private coach bus and van operators.

As part of its Long-Term Parking Management Plan, Massport is considering a series of measures to minimize pick-up/drop-off activity. The EDR indicates that the increase in terminal area parking rates since July 1, 2014 described in the 2014 EDR, does not seem to be have influenced parking demand; daily parking demand more frequently approached the Parking Freeze cap in 2015. The 2015 EDR identifies a proposal to build up to 5,000 new on-Airport commercial parking spaces. Massport states that the goal of the project is to reduce the number of drop-off/pick-up mode which generate more traffic than parking. The construction of additional commercial parking spaces is dependent upon amending the Parking Freeze legislation. Massport has initiated a stakeholder process prior to proposing any amendments and Massport anticipates initiating a parallel review process.

The Airport-wide Automated Traffic Monitoring System (ATMS) consists of permanent traffic count stations at the Airport's gateway roadways, including the Route 1A roadway ramps, the Interstate-90 (I-90) Ted Williams Tunnel ramps, and Frankfort Street/Neptune Road. These stations provide data on annual average daily traffic (AADT), annual average weekday daily traffic (AWDT), and annual average weekend daily traffic (AWEDT). The AADT increased by 0.1 percent between 2014 and 2015. The change in average daily traffic can be attributed to: a 5.7-percent increase in air passenger activity in 2015; a 3.0-percent increase in taxi dispatches in 2015; and 1.1-percent decrease in parking activity (exits) in 2015. Historically, the highest AADT recorded at Logan Airport was in 2007, when AADT reached 110,690, AWDT was 119,200, and AWEDT was 91,320 that same year. These gateway traffic volumes corresponded to an annual air passenger level of 28,102,455 passengers.

On-Airport vehicle miles of travel (VMT) is calculated based on the total number of miles traveled by all vehicles within the Logan Airport roadway system and is used to calculate motor vehicle air emissions. Massport upgraded its modeling capabilities in 2011 and began using an on-Airport VISSIM-10 model which is more robust than the previous model. The adjustment factors for the 2015

VMT calculations were determined by using 2011 to 2015 gateway, Airport roadway, and parking volume averages.

Based on the traffic data obtained from Massport's ATMS, the change in on-Airport daily traffic volumes between 2014 and 2015 was negligible. However, 2015 evening peak hour gateway volumes grew by roughly 5 percent when compared to 2014. Additionally, a shift in gateway traffic entering/exiting the Airport from the Ted Williams Tunnel to the Sumner/Callahan Tunnels was noted. Daily traffic volumes in the Ted Williams Tunnel decreased by 8.4 percent (from 49,600 to 45,400 vehicles) while volumes in the Sumner/Callahan Tunnels increased by 19.5 percent (from 29,800 to 35,600 vehicles). Since 2000, the highest average weekday VMT estimated at Logan Airport was in 2007, when weekday VMT was modeled at 184,613. Although VMT was estimated at lower levels in 2015, a direct comparison between values cannot be made because of significant changes in the study area.

The 2016 ESPR should report on 2016 ground access conditions at the airport and provide a comparison of 2016 findings to those of 2015 for the following:

- Detailed description of compliance with Logan Airport Parking Freeze;
- HOV ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express);
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport VMT;
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning;
- Results of the 2016 Logan Airport Air Passenger Survey; and,
- Status of proposed connector to the Airport Station associated with the planned Terminal E Modernization Project.

A-39

The chapter should present a discussion of analytical methodologies and assumptions for the planning horizon year (2035) for traffic volumes, on-airport VMT and parking demand.

A-40

The 2016 ESPR should address the following topics:

- Massport's target HOV mode share along with incentives;
- Non-Airport through-traffic;
- Massport's cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Silver Line, Water Transportation, and Logan Express;
- Efforts to increase capacity and usage of Logan Express;
- Progress on enhancing water transportation to and from Logan Airport;
- Report on results of ground access study; and
- Strategies for enhancing services and increasing employee membership in the TMA.

A-41

Noise

The 2015 EDR updates the status of the noise environment at Logan Airport in 2015, and describes Massport's efforts to mitigate noise exposure and impacts. As noted previously, the implementation of RNAV has resulted in concentration of flight patterns over certain communities and significant increases in noise exposure. Noise complaints have increased from 12,855 calls in 2014 to 17,685 calls in 2015. In addition, the FAA introduced the AEDT, a new model for noise and air quality. Massport did not submit AEDT modeling results and, instead, modeled noise using the FAA's Integrated Noise Model (INM) as in previous years. Massport intends to use the AEDT for noise modeling for the 2016 ESPR if the adjustments are approved by the FAA. Massport should update the MEPA office regarding the status of the requested adjustments and consult with the MEPA office regarding ESPR noise modeling as early as possible if the FAA does not approve use of the requested adjustments or it appears that the FAA review will be delayed. I note comments that indicate data should be provided regardless of FAA's approval or timing. Otherwise, noise contours for 2016 should be developed using AEDT and compared to the most recent version of the Integrated Noise Model (INM) which has been in place for all previous EDRs and ESPRs. Logan Airport-specific model adjustments made to account for over-water sound propagation and the propagation of sound to areas of higher terrain may be reported as an add-on to AEDT, if accepted by the FAA.

A-42

A-43

Compared to 2000, the 2015 EDR indicates that total operations were down by 23.6 percent while total passengers were up by 20.6 percent; that the percentage of jet operations increased to 86 percent from 66 percent; and the number of people exposed to Day-Night Average Sound Level (DNL) 65 decibels (dB) has declined by 20.6 percent.

Compared to 2014, the 2015 DNL 65 dB noise contours were larger in most areas around the Airport due to changes in: (1) runway usage, primarily as a result of wind and weather conditions, (2) a 5.7% increase in the number of nighttime operations, and (3) an increase in the number of overall operations. The overall number of people exposed to DNL values greater than or equal to 65 dB increased by 58.0 percent, from 8,922 people in 2014 to 14,097 people in 2015. This increase is a significant concern to residents, as clearly indicated in comment letters, and to Massport.

Runway use changes from 2014 to 2015 were the largest factor in the increase in the number of people exposed to DNL values greater than or equal to 65 dB in 2015 which is a significant issues raised in many comments. The DNL contour increased in East Boston and slightly in South Boston due to an increase in Runway 22R departures. The DNL contour in Winthrop increased because departures from Runway 22L increased. Increased nighttime arrivals to Runways 22L and 27 contributed to increases in Revere and Winthrop. Data from 2015 reflects almost a full year of the head-to-head night noise abatement procedures on Runway 15R-33L. While this reduces overall noise exposure by concentrating operations over water rather than over populated areas, it increases start-of-takeoff-roll noise in East Boston, north and west of the Runway 15R end. Decreased use of Runway 4R for arrivals in 2015 resulted in a reduction in the contour south of the Airport.

Nighttime operations increased from 48,056 to 50,786 in 2015. The increase remains below the peak of 54,038 annual operations at night reached in 1999; however, this growth is significant and a particular concern given the extent and concentration of noise exposure. As airlines have expanded to

new destinations, the number of commercial operations, and in turn the number of nighttime operations, has increased. In 2015, there was an increase of 7.5 nighttime operations per day compared to 2014.

The overall increase in operations was smaller than the increase in nighttime operations (2.5 percent overall versus 5.7 percent nighttime), but contributed to the expansion of the noise contours. The DNL and population levels in 2015 remain well below the peak levels reached in 1990 and are less than in the year 2000 when 17,745 people were exposed to DNL levels greater than or equal to DNL 65 dB. The 2015 DNL 65 dB contour is somewhat larger than the 2014 DNL 65 dB contour. Almost all of the residences exposed to levels greater than or equal to DNL 65 dB in 2015 have been eligible in the past to participate in Massport's residential sound insulation program (RSIP). To date, Massport has provided sound insulation for a total of 11,515 residential units, and will continue to seek funding for sound insulation for properties that are eligible and whose owners have chosen to participate.

The 2016 ESPR should provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2016 conditions and compare those conditions to those of 2015 for the following:

- Fleet Mix, including Stage II, Recertified Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft;
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals); and
- Flight tracks.

A-44

The 2016 ESPR should report on the following:

- Changes in annual noise contours and noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed;
- Cumulative Noise Index (CNI);
- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and
- Flight track monitoring noise reports.

A-45

The 2016 EDR should also report on consultation between Massport and FAA regarding the impacts of RNAV, noise abatement efforts, results of Boston Logan Airport Noise Study (BLANS) study, and provide an update on the noise and operations monitoring system.

A-46

Air Quality/Emissions Reduction

The 2015 EDR provides an overview of airport-related air quality issues in 2015 and efforts to reduce emissions. The air quality modeling reported in 2015 EDR is based on aircraft operations, fleet mix characteristics, airfield taxiing times, GSE usage, motor vehicle traffic volumes, and stationary source utilization rates. Total air quality emissions from all sources associated with Logan Airport in 2015 are significantly less than they were a decade ago.

In 2015, calculated emissions of volatile organic compounds (VOCs), oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM) went up slightly compared to 2014. The increase is

primarily due to the increase in aircraft landing and take offs (LTOs) and airfield taxi times. Total emissions of VOCs increased by 1 percent in 2015 to 1,188 kilograms (kg)/day compared to 1,177 kg/day in 2014. Total NOx emissions increased by approximately 5 percent in 2015, to 4,262 kg/day compared to 2014 levels of 4,040 kg/day. Massport's voluntary Air Quality Initiative (AQI) has tracked NOx emissions since the benchmark year of 1999. In the final year of this program (2015), total NOx emissions were 632 tons per year (tpy) lower than the 1999 benchmark. This represents an overall decrease of 27 percent in NOx emissions over the past 15 years. Between 1999 and 2015, the greatest reductions of NOx emissions were associated with aircraft, GSE, and on-Airport motor vehicles at 17 percent, 71 percent, and 87 percent reductions, respectively. Total CO emissions increased by about 3.5 percent in 2015 to 7,243 kg/day, from 6,987 kg/day in 2014; emissions in 2015 were still well below 1990 and 2000 levels. Total PM10/PM2.5 emissions also increased by about 3 percent in 2015 to 98 kg/day, from 95 kg/day in 2014.

The ESPR should contain an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, changes in air quality modeling and air quality studies. The ESPR should also provide discussion on progress on the national and international levels to decrease air emissions, including alternative fuel vehicle programs implemented by Massport and/or its tenants. If the AEDT tool is used for modeling the 2016 ESPR should compare results to the most recent version of the Emissions Dispersion Modeling System (EDMS) that has been used in recent EDR filings. The Environmental Protection Agency (EPA) MOVES2014a program will continue to be used to estimate vehicular emission on airport roadways. The ESPR should include an emissions inventory for CO, NOx, VOCs, and PMs.

A-47
A-48
A-49
A-50

Commenters express concern that the EDR does not provide a substantive response to concerns expressed regarding ultrafine particulates (UFP). As commenters are aware, UFPs are not regulated by the US Environmental Protection Agency (EPA) and EPA has not proposed to adopt standards for UFPs. I encourage Massport to consider how the ESPR might constructively address the concern presented by commenters. The ESPR should specifically identify any ongoing or new policies or programs that would reduce diesel emissions.

A-51

The ESPR should include an update on its efforts to encourage the use of single engine taxiing under safe conditions and, as required in the review of the Terminal E Expansion, Massport should report on progress made in designing the energy systems for the facility and the feasibility of combined heat and power (CHP).

A-52
A-53

Water Quality/Environmental Compliance

The 2015 EDR describes Massport's ongoing environmental management activities including National Pollutant Discharge Elimination System (NPDES) compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management. Massport's primary water quality goal is to prevent or minimize pollutant discharges, thus limiting adverse water quality impacts of airport activities. Massport employs several programs to promote awareness of activities that may impact surface and groundwater quality. Programs include implementing best management practices (BMPs) for pollution prevention by Massport, its tenants, and its construction contractors; training of staff and tenants; and a comprehensive stormwater pollution prevention plan. The EDR reports that Massport continues to comply with water quality and other environmental regulations.

The 2016 ESPR should identify any planned stormwater management improvements and report on the status of:

- NPDES Permit and monitoring results for Logan Airport's outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- MCP activities;
- Tank management;
- Environmental management plan; and
- Fuel spill prevention.

A-54

Conclusion

I have determined that the 2015 EDR for Logan Airport has adequately complied with MEPA. The EDR provides a comprehensive overview of environmental planning, issues and data. Massport may prepare the 2016 ESPR for submission in 2017 consistent with the Scope included in this Certificate.

February 17, 2017
Date

Matthew A. Beaton

Comments received:

01/18/2017 Logan CAC
01/20/2017 Nancy Timmerman
01/20/2017 Stephen Kaiser
01/20/2017 Boston Harbor Now
01/31/2017 Brian Palmucci, Quincy City Council
01/31/2017 Aaron Toffler, Airport Impact Relief, Inc.
01/31/2017 Chris Marchi
01/31/2017 Wig Zamore
02/01/2017 Bill Schmidt
02/01/2017 Cindy L. Christiansen
02/01/2017 James Roberts
02/01/2017 James Linthwaite
02/01/2017 Town of Milton Office of Selectmen
02/02/2017 John Antonellis
02/17/2017 U.S. Senator Elizabeth Warren

MAB/ACC/acc

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

November 13, 2015

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
2014 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2014 Environmental Data Report
PROJECT MUNICIPALITY	: Boston/Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: October 7, 2015

As Secretary of Executive Office of Energy and Environmental Affairs (EEA), I hereby determine that the Environmental Data Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA) (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

Background

The environmental review process for Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of the Massachusetts Port Authority's (Massport) long-range planning process. The ESPR provides a "big picture" analysis of the environmental impacts of current and anticipated levels of activities, and presents an overall strategy to minimize impacts. The ESPR is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments for project-specific Environmental Impact

Reports (EIR). The ESPR is generally updated on a five-year basis; the most recent ESPR for the year 2011 was filed in April of 2013. Environmental Data Reports (EDRs) (formerly referred to as Annual Updates) are filed in the years between ESPRs.

The EDRs are prepared annually to evaluate environmental conditions for the reporting year compared to the previous year. In the last several years, aircraft operations and passenger activity levels and associated environmental effects have remained well below levels previously analyzed for Logan Airport. Thus, the forecasted aviation growth presented in the 2004 ESPR, the predicate upon which the ESPR schedule was initially established, has not occurred. Accordingly, with the approval of the Secretary of Energy and Environmental Affairs, Massport prepared 2009 and 2010 EDRs in lieu of the ESPR originally planned for 2009. The 2011 ESPR, filed in early 2013, reported on calendar year 2011 passenger activity levels and aircraft operations forecasts. The 2012/2013 EDR presented conditions for both calendar years 2012 and 2013.

The 2014 EDR is the subject of this review. Additionally, this Certificate contains a Scope for the 2015 EDR. This 2014 EDR provides a comprehensive, cumulative analysis of the effects of all Logan Airport activities based on actual passenger activity and aircraft operational levels in 2014 and presents environmental management plans for addressing areas of environmental concern. It also reports on the status of project mitigation. The next anticipated ESPR will report on updated passenger activity levels, aircraft operations forecasts, and environmental conditions forecasts for 2016.

Passenger levels at Logan Airport reached a new peak in 2013, exceeding the 2007 historic peak, while aircraft operations at Logan Airport remained well below the historic peak reached in 1998. The 2014 EDR examines the effects of airlines operating much more efficiently with quieter fleets and flying more passengers per aircraft. As discussed in the 2011 ESPR, the 2014 EDR anticipates further increases in activity levels and some increases in environmental impacts compared to recent years; however, these will remain below levels projected in 2004.

Scope for the 2015 EDR

General

The 2015 EDR should follow the general format of the 2014 EDR. The 2015 EDR should include an Executive Summary and Introduction. To provide context for reviewing agencies and the public, it should provide background information on the environmental policies and planning that shape the environmental reporting, technical studies, and environmental mitigation initiatives at Logan Airport. A-1

The 2015 EDR should provide an update on conditions at Logan Airport for calendar year 2014, including passenger and aircraft operation activity levels. It should continue to serve as a background/context against which projects at Logan Airport can be evaluated. It should also report on the cumulative effects of Logan Airport operations and activities, compared to previous A-2

years, as appropriate. It should provide a status report on Massport's proposed planning initiatives, projects, and mitigation measures. A-2 Cont.

The technical studies in the 2015 EDR should include reporting on and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking. The 2015 EDR must also respond to those issues explicitly noted in this Certificate and the comments received on the 2014 EDR. A-3

A distribution list for the 2015 EDR (indicating those receiving documents, CDs, or Notices of Availability) should be provided in the document. This section must also include copies of all ESPR and EDR Certificates issued since the 2011 Logan ESPR to provide context for reviewers. Supporting technical appendices should be provided as necessary. A-4

Responses to Comments

The 2015 EDR Responses to Comments should address all of the substantive comments from the letters listed at the end of this Certificate. The Responses to Comments included in the 2014 EDR is well-constructed and cross-referenced. I encourage Massport to use the same format in the 2015 EDR. A-5

The majority of comments received on the 2014 EDR focus on noise issues, including measurement of noise, modeling of noise contours, and noise abatement, and emissions reduction issues. In addition to responding to these comments, the 2015 EDR should continue to report on the refinements to noise tracking and abatement efforts. Massport should consult directly with individual commenters where appropriate. A-6

Activity Levels

The Activity Levels chapter provides a solid analysis of major activity issues and the technical appendix contains useful and detailed information. This chapter presents aviation activity statistics for Logan Airport in 2014. Logan Airport is New England's primary domestic and international airport, operating as an origin-destination airport, rather than a connecting hub for major airlines. The total number of air passengers increased by 4.7 percent to 31.6 million in 2014, compared to 30.2 million in 2013. The 2014 passenger level represents a new record high for Logan Airport.

Passenger-aircraft operations accounted for 91 percent of total aircraft operations. The total number of aircraft operations increased slightly from approximately 361,339 in 2013 to 363,797 in 2014, a 0.7 percent increase. This was preceded by a 2.4 percent increase in 2013. Despite the increase, aircraft operations at Logan Airport remained well below the 487,996 operations in 2000 and the historic peak achieved in 1998. In 1986, Logan Airport served 21.7 million air passengers, as compared to 31.6 million in 2014 with roughly the same number of total operations (363,995).

Aircraft efficiency continued to improve in 2014 as the average number of passengers per aircraft operation grew from 83.6 in 2013 to 87.0 in 2014. This positive trend is indicative of the industry-wide shift toward higher aircraft load factors and an increase in the number of domestic and international destinations. While the number of domestic and international passengers is increasing, international passenger demand is projected to increase at a faster rate than domestic passenger demand. Total international annual passenger numbers increased from 4.4 million in 2013 to 4.9 million in 2014, a 9.8-percent increase. The strong international passenger growth was driven by several new nonstop services introduced by a number of foreign airlines including Emirates, Turkish Airlines, Hainan Airlines, and Cathay Pacific. Recently launched international destinations include Mexico City, Tokyo, Beijing, Dubai, Istanbul, Panama City, Hong Kong, and Shanghai. International air passengers are anticipated to reach 6 million by 2022 and 8 million by 2030.

The 2015 EDR should report on airport activity levels and aircraft operations, including:

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Passenger activity levels;
- Cargo and mail activities;
- Compare 2014 aircraft operations, cargo/mail operations, and passenger activity levels to 2013 activity levels; and
- Report on national aviation trends in 2014 and compare to trends at Logan Airport.

A-7

It should also report on Massport's activity level forecasts that will become the basis for the planning and impact sections that follow and for Massport's strategic planning initiatives for the future ESPR. Massport should address comments related to activity levels in the 2015 EDR. A-8

Sustainability at Logan Airport

The 2014 EDR describes Massport's airport wide sustainability goals. In October 2000, the Massport Board approved an Environmental Management Policy, which articulates Massport's commitment to protect the environment and to implement sustainable design principles. In 2013, Massport was awarded a grant by the Federal Aviation Administration (FAA) to prepare a Sustainability Management Plan (SMP) for Logan Airport. The purpose of the SMP is to enhance the efficiency and sustainability of Logan Airport's operations and to support the broader sustainability principles of the Commonweath. The Logan Airport SMP planning effort began in May 2013 and was completed in April 2015. The plan is intended to promote and integrate sustainability Airport-wide and to coordinate ongoing sustainability efforts at Massport. A baseline data assessment was completed in winter 2014 to assess current sustainability performance at the Airport. The Logan Airport SMP developed a framework and implementation plan, with metrics and targets, designed to track progress over time.

The 2014 EDR provides an excellent overview of Massport's commitment to incorporate sustainability into all aspects of Massport's activities: Planning and Design; Construction; Operations, Maintenance and Management; and Monitoring of Environmental Performance. It also identifies specific practices to reduce impacts of construction and efforts to address energy intensity, percentage of renewable energy, and GHG reductions. The SMP establishes goals for

ten categories: Energy and Greenhouse Gases; Water Conservation; Community, Employee, and Passenger Well-being; Materials, Waste Management, and Recycling; Resiliency; Noise Abatement; Air Quality Improvement; Ground Access and Connectivity; Water Quality/Stormwater; and Natural Resources.

A specific example includes compliance with the Leading by Example Executive Order which requires state agencies to procure 15 percent of their electricity from renewable resources by 2012. The Leading by Example program has influenced Massport's own operations including its offices, heating plants, and garages resulting in Massport receiving the Leading by Example award in 2008. Massport is striving to achieve LEED certification for new and substantial rehabilitation of building projects over 20,000 square feet. Some recent examples of LEED certified buildings at Logan Airport. The new Rental Car Center in the Southwest Service Area (SWSA) began construction in 2010 and was completed in 2013and was awarded Logan Airport's first LEED Gold Certification in 2015.

I commend Massport for its commitment to sustainability and its leadership. Progress on the SMP should be incorporated into subsequent EDRs and ESPRs. The 2015 EDR should report on the progress towards each of the ten goals and sustainability-related performance. A-9

The 2015 EDR should report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review, including whether they are under construction or completed. The status of mitigation commitments made in the Section 61 Findings for the following projects should be included: A-10

- West Garage/Central Garage (EEA #9790)
- International Gateway (EEA #9791)
- Logan Airside Improvements Planning Project (EEA #10458)
- Terminal A Replacement Project (EEA #12096)
- Southwest Service Area Redevelopment Program/Rental Car Center (EEA #14137)
- Logan Runway Safety Area Improvements Project (EEA #14442)

<u>Planning</u>

The Airport Planning chapter in the 2014 EDR provides an overview of planning, construction, and permitting activities that occurred at Logan Airport in 2014. It also describes future planning, construction, and permitting activities and initiatives. It includes the following Airport Projects:

- *Parking Consolidation Project*: Massport is consolidating 2,050 temporary parking spaces as an addition to the West Garage and at the existing surface lot between the Logan Office Center and the Harborside Hyatt. These spaces constitute all the remaining spaces permitted under the Logan Airport Parking Freeze. The West Garage addition is atop the existing Hilton Hotel parking lot. The project will incorporate sustainable design and resiliency elements. The consolidation is expected to be completed in 2015.
- *Terminal E Renovation and Enhancements Project*: This project includes interior and exterior improvements at Terminal E to accommodate regular service by wider and

longer Group VI aircraft. The project does not include any new gates, but will reconfigure three existing gates to accommodate Group VI aircraft (including the Airbus A380 and Boeing 747-8 primarily used by international air carriers). An addition to the west side of Terminal E will allow passenger holdrooms to be reconfigured to accommodate the larger passenger loads associated with larger aircraft. The project also includes modifications to the airfield to meet required Federal Aviation Administration (FAA) safety and design standards to accommodate the larger aircraft. An Environmental Assessment (EA) was filed and FAA issued a Finding of No Significant Impact (FONSI) on July 29, 2015. Construction commenced in 2015.

- *Terminal E Modernization Project*: To accommodate existing and long range forecasted demand for international service in an efficient, environmentally-sound manner that also improves customer service, Massport is planning to expand Terminal E. Modernizing Terminal E would add the three contact gates approved in 1996 as part of the International Gateway West Concourse project (EEA #9791), which were never constructed, and an additional two to four additional new gates in an extended concourse. A key feature of this project is the first direct pedestrian connection from the MBTA Blue Line Airport Station to the terminal complex at Logan Airport. This project would also include improvements to Airport roadways to facilitate access. The project is in the conceptual design phase. Massport intends to commence construction prior to 2018. An Environmental Notification Form (ENF) for this project (EEA#15434) was published in the November 9 Environmental Monitor.
- *Logan Airport Greenway Connector Project:* The Logan Airport Greenway Connector ("Greenway Connector") is a pedestrian/bicycle path connecting the Bremen Street Park path to the future City of Boston Narrow Gauge Connector, a pedestrian/bicycle path that begins at the Greenway Overlook and continues to Constitution Beach. Construction of the Greenway Connector began in spring 2013 and was completed in July 2014.
- *The Rental Car Center (RCC)*: Consolidating the rental car shuttle bus fleet and some Massport shuttle buses into a unified shuttle route system resulted in the elimination of eight rental car bus fleets (a net total of 66 buses have been eliminated). It included intersection and roadway infrastructure improvements including signal coordination and dedicated ramp connections. It also created a Ground Transportation Operations Center (GTOC) to support efficient planning and operation of Airport-wide transit activities.

In recognition of the potential and significant effects of climate change on Massport infrastructure and operations, Massport has initiated the Disaster and Infrastructure Resiliency Planning (DIRP) Study. A particular concern for Massport is the effects of sea level rise and projected increases in the severity and frequency of storms. The Study includes Logan Airport, the Port of Boston, and Massport's waterfront assets in South and East Boston. The DIRP Study includes a hazard analysis; modeling of projected sea-level rise and storm surge; and, temperature and precipitation projections and anticipated increases in extreme weather events. The study is nearing completion. The 2015 EDR should provide a summary of the DIRP Study and identify which recommendations Massport will implement in the short term to increase the resiliency of its facilities to the potential effects of climate change. A-11

Massport is developing a long-term parking management plan for Logan Airport. The Long-Term Parking Management Plan will lay out a multi-part strategy for efficiently managing parking supply, pricing, and operations – both at Logan Airport and at off-Airport locations controlled by Massport – to maximize access for transit and shared-ride vehicles while minimizing both drive-and-park and pick-up/drop-off modes. The 2015 EDR should provide updates on this plan. A-12

The 2015 EDR should also report on Massport planning to improve Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport also must accommodate and guide tenant development. Specifically, the 2015 EDR should also describe the status of planning initiatives for the following areas: A-13

- Roadway Corridor Project;
- Airport Parking;
- Terminal Area;
- Airside Area;
- Service and Cargo Areas; and
- Airport Buffers and Landscaping.

The 2015 EDR should provide a status report on long-range planning activities. This chapter should include the status and effectiveness of the ground access changes, including roadway and parking projects, that will consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on external streets in adjacent neighborhoods. A-14

Regional Transportation

The 2014 EDR describes activity levels at New England's regional airports in 2014 and provides an update on regional planning activities, including long-range transportation efforts. The New England region is anchored by Logan Airport and a system of 10 other commercial service, reliever, and general aviation (GA) airports (regional airports). Overall, passenger traffic at the New England airports in 2014 represented the highest passenger traffic level for the region since the economic downturn in 2008. The increase in the region's passenger traffic was largely driven by continued growth at Logan Airport. In 2014, the total number of air passengers utilizing New England's commercial service airports, including Logan Airport, increased by 3.1 percent from 45.4 million in 2013 to 46.8 million annual air passengers in 2014. Of the 46.8 million passengers using New England's commercial service airports in 2014, 67.6 percent of passengers (31.6 million) used Logan Airport compared to 66.6 percent (30.2 million) in 2013. While passenger activity levels have increased, aircraft operations in the New England region have decreased. In 2014, regional aircraft operations decreased by 4.3 percent, from 1.02 million operations in 2013 to 0.97 million operations in 2014.

The 2015 EDR should describe Logan Airport's role in the region's intermodal transportation system by reporting on the following:

Regional Airports

- 2015 regional airport operations, passenger activity levels, and schedule data within an historical context;
- Status of plans and new improvements as provided by the regional airport authorities;
- Ground access improvements; and
- Role of the Worcester Regional Airport and Hanscom Field in the regional aviation system and Massport's efforts to promote these airports. A-15

Regional Transportation System

- Massport's role in managing the regional transportation facilities within MassDOT;
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership.

Ground Access to and from Logan Airport

The 2014 EDR reports on transit ridership, roadways, traffic volumes, and parking for both 2012 and 2013. Specifically, the EDR states that Massport has continued to invest in and operate Logan Airport with a goal of increasing the number of passengers arriving by transit or other high occupancy vehicle (HOV) modes. The HOV/transit mode share at Logan Airport continues to rank at the top of U.S. airports. However, private passenger vehicle trips continue to increase with growth in air travel. As Logan Airport air traveler numbers have increased, a constrained parking supply at Logan Airport has resulted in an increase in pick-up and drop-off vehicle trips. These trips generate automobile emissions both locally and regionally. As part of its Long-Term Parking Management Plan, Massport is considering a series of measures to minimize pick-up/drop-off activity.

In 2014, Massport remained in full compliance with the Logan Airport Parking Freeze regulations. Despite an increase in terminal area parking rates on July 1, 2014, daily parking demand more frequently approached the Parking Freeze cap in 2014. Massport is consolidating 2,050 temporary parking spaces in addition to the West Garage and at the existing surface lot between the Logan Office Center and the Harborside Hyatt. These spaces constitute all remaining spaces permitted under the Logan Airport Parking Freeze. Increases in weekday peak commercial parking demand places additional pressure on roadway and parking operations under the Logan Airport Parking Freeze. In 2014, due to high demand on Tuesdays, Wednesdays, and Thursdays, 30,314 cars were diverted to another garage or lot and 56,634 cars were valeted/stacked (when cars are parked in aisles, have their keys taken, and then are re-parked in empty spaces as they become vacant); this represents over a 50 percent increase since 2013. There were about 40 weeks in which one or more of these measures were put into effect in 2014.

The 2015 EDR should report on the following and compare trends to 2014:

- Detailed description of compliance with Logan Airport Parking Freeze;
- High occupancy vehicle (HOV) ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express);
- Massport's cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line and Silver Line;
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport vehicle miles traveled (VMT);
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning; and
- Results of the 2015 Logan Airport Passenger Survey.
- Massport's target HOV mode share along with incentives; and,
- Non-Airport through-traffic;
- Report on Logan Express usage and efforts to increase capacity and usage;
- Report on water transportation to and from Logan Airport; and
- Report on results of ongoing ground access studies.

A-16

Noise Abatement

The 2014 EDR updates the status of the noise environment at Logan Airport in 2012 and 2013, and describes Massport's efforts to reduce noise levels. Many of the issues raised in the noise analysis are ongoing and require continuous monitoring. The 2015 EDR should address the noise issues raised by numerous commenters on the 2014 EDR.

A-17

In 2014, an additional 106 residential units received sound insulation bringing the program total to 11,515 residential units treated, amongst the highest in the nation. Since 2000, the number of daily aircraft operations has declined by almost 27 percent (from 1,355 operations per day in 2000 to 997 operations per day in 2014). This trend reflects an increase in the use of larger aircraft, airline consolidation, and increased efficiencies on the part of airlines. As described throughout this EDR, this evolution towards fewer flights with larger, more efficient and quieter aircraft has yielded substantial environmental benefits. Compared to 2000, in 2014:

- Jet operations made up 86 percent of operations compared to 66 percent;
- Overall operations were down by 25 percent while overall passengers were up by 14 percent; and
- The number of people exposed to DNL 65 dB has declined by 50 percent since 2000. Compared to 2013, the 2014 DNL 65 dB noise contours were larger in most areas around the Airport. The DNL contour was larger over East Boston, Winthrop, and Revere.

There were several temporary FAA- mandated airfield/airspace operating factors that influenced the contour changes in 2014. Due to safety concerns at airports across the US in June of 2014, the FAA temporarily halted the use of head-to-head operations or opposite direction operations, in which planes arrive on a runway in one direction and depart in the opposite direction. When in use at Logan Airport, the procedure has aircraft departing from Runway 15R and landing on Runway 33L during the late night (typically midnight to 5:00 AM) when weather conditions are appropriate, including good visibility and little wind. At Logan Airport, head-to-head operations are an important part of the use of the late night noise abatement runway (Runway 15R-33L) since this keeps operations over Boston Harbor. Use of this procedure was restored in early 2015. FAA also restricted the use of converging runways across the United States in January 2014 due to safety concerns. At Logan Airport, Runways 22L and 22R and Runway 27 were affected by this change. While Runway 22R is in use for departing aircraft, arrivals that would typically be directed to Runway 27 were sent by the FAA Air Traffic Control to arrive on Runway 22L. This restriction has since been lifted. Runway 15L-33R was closed for a short period of time (eight weeks) during the summer of 2014 for Runway Safety Area Improvements. This resulted in aircraft using Runway 15R-33L, Runway 4L, and Runway 22L more frequently in 2014 than in 2013. The construction activity also resulted in short closures of the intersecting Runway 4L-22R and Runway 4R-22L, which increased usage of Runway 15R-33L. An additional factor influencing the contour changes was an increase in overall operations and nighttime operations in 2014 compared to 2013. Nighttime operations increased for passenger flights as airlines expanded destinations and the number of flights per day. Several new international airlines began service at Logan Airport in 2014.

The information in the Noise Abatement chapter is very informative. I expect detailed analysis will be provided in the 2015 EDR and that Massport will consider and address the comments on noise and noise related issues.

A-18

The 2015 EDR should provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2015 conditions and compare those conditions to those of 2014 for the following:

- Fleet Mix, including Stage II, Recertified Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft;
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals);
- Preferential runway advisory system (PRAS) tracking; and
- Flight tracks.

A-19

In 2015, the FAA introduced a new combined noise and air quality modeling tool, the Aviation Environmental Design Tool (AEDT), which must be used for all airport projects. The AEDT is a software system that dynamically models aircraft performance in space and time to produce fuel burn, emissions, and noise information. Noise contours for 2015 will be developed using AEDT and compared to the most recent version of the Integrated Noise Model (INM) which has been in place for all previous EDRs and ESPRs. Logan Airport-specific model

adjustments made to account for over-water sound propagation and the propagation of sound to areas of higher terrain may be reported as an add-on to AEDT, if accepted by the FAA. This 2015 EDR should report on the following:

- Changes in annual noise contours and noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed;
- Cumulative Noise Index (CNI);
- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and
- Flight track monitoring noise reports.

A-20

The 2015 EDR should also report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) study, and provide an update on the noise and operations monitoring system.

A-21

Air Quality/Emissions Reduction

The 2014 EDR provides an overview of airport-related air quality issues in 2014 and also efforts to reduce emissions. The air quality modeling reported in 2014 EDR is based on aircraft operations, fleet mix characteristics, and airfield taxiing times combined with ground support equipment (GSE) usage, motor vehicle traffic volumes, and stationary source utilization rates. Total air quality emissions from all sources associated with Logan Airport in 2014 are significantly less than they were a decade ago. The EDR attributes this downward trend to Massport's longstanding objective to accommodate the demands of increasing passenger and cargo activity levels with fewer aircraft operations generating fewer emissions.

In 2014, calculated emissions of volatile organic compounds (VOC), oxides of nitrogen (NOx), and particulate matter (PM) went up slightly. This was primarily attributable to changes in the modeling software, MOVES2014. Overall, modeled air quality emissions were similar in 2014 to 2013 conditions and followed recent trends. The changes in 2014 modeled air quality emissions, as compared to 2013, are primarily due to technical changes in the model itself. Inputs to the model include aircraft operations, fleet mix characteristics, and airfield taxi times combined with ground service equipment (GSE) usage, motor vehicle traffic volumes, and stationary source utilization rates. Model versions used in the 2014 analyses differed in terms of emission factors, most notably otor vehicle emissions. The modeled air quality conditions in 2014 for Logan Airport were for carbon monoxide (CO), NOx, VOCs, and PM.

- Total VOC emissions went up by 3 percent (1,177 kilograms per day [kg/day]) in 2014 compared to 2013. The increase is primarily due to the corresponding increase in aircraft landing and take-offs (LTOs) and an increase in jet fuel and gasoline usage when compared to 2013. For comparison, total VOC emissions were 1,777 kg/day in 2000.
- Total NOx emissions went up by less than 1 percent in 2014 (4,040 kg/day) compared to 2013. This slight increase in 2014 is mostly attributable to the larger number of air carrier operations during this time period. For comparison, total NOX emissions were 5,707 kg/day in 2000.

- Total CO emissions went down by 5 percent in 2014 (6,987 kg/day) compared to 2013. This decrease is mostly attributable to the decrease in GSE factors and motor vehicle emission factors in accordance with MOVES2014. For comparison, total CO emissions were 13,111 kg/day in 2000.
- Total $PM_{10}/PM_{2.5}$ emissions went up by approximately 3 percent in 2014 (95 kg/day) compared to 2013. This small increase is primarily attributable to the higher emission factors of MOVES2014.
- Total greenhouse gas (GHG) emissions went down by approximately 1 percent in 2014 compared to 2013. This decrease was primarily due to a decrease in vehicle miles traveled (VMT).
- Massport's Air Quality Initiative (AQI) has tracked NOx emissions since the benchmark year of 1999. Total NO_x emissions in 2014 were 722 tons per year (tpy) lower than the 1999 benchmark which represents an overall decrease of 31 percent in NOx emissions since 1999 when the program was initiated. For comparison, NO_x emissions in 2013 were 730 tpy lower than the benchmark.

Massport has also committed to include an inventory of GHG emissions from Logan Airport in the 2015 EDR. GHG emissions should be quantified for aircraft, GSE, motor vehicles and stationary sources using appropriate emission factors and methodologies. The 2015 EDR should include an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The 2015 EDR should provide discussion on progress on the national and international levels to decrease air emissions. It should also include analysis methodologies and assumptions and report on conditions using the FAA's new AEDT model, described above. It will compare results to the most recent version of the Emissions Dispersion Modeling System (EDMS) that has been used in recent EDR/ESPR filings. It should include emissions inventories for CO, NO_x, VOCs, and PM emissions by airline. The 2015 EDR should also report on Massport's and Tenant's Alternative Fuel Vehicle Programs and Logan Airport air quality studies undertaken by Massport or others, as available.

A-22

The results of the 2015 GHG emissions inventory should be compared to the 2014 results. This chapter should also include an update on Massport's efforts to encourage the use of single engine taxiing under safe conditions.

A-23

Water Quality/Environmental Compliance

The 2014 EDR describes Massport's ongoing environmental management activities including National Pollutant Discharge Elimination System (NPDES) compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management. Massport's primary water quality goal is to prevent or minimize pollutant discharges, thus limiting adverse water quality impacts of airport activities. Massport employs several programs to promote awareness of activities that may impact surface and groundwater quality. Programs include implementing best management practices (BMPs) for pollution prevention by Massport, its tenants, and its construction contractors; training of staff and tenants; and a comprehensive stormwater pollution prevention plan. The EDR reports that Massport continues to comply with water quality and other environmental regulations.

The 2015 EDR should identify any planned stormwater management improvements and report on the status of:

- NPDES Permit and monitoring results for Logan Airport's outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- MCP activities;
- Tank management;
- Update on the environmental management plan; and
- Fuel spill prevention.

A-24

Conclusion

I have determined that the 2014 EDR for Logan Airport has adequately complied with MEPA. The EDR provides a comprehensive overview of environmental planning, issues and data. Massport may prepare the 2015 EDR for submission in 2016 consistent with the Scope included in this Certificate.

November 13, 2015
Date

Matthew A. Beaton

Comments received:

10/30/2015 Nancy S. Timmerman
11/05/2015 Town of Milton, Office of Selectmen
11/06/2015 Stephen H. Kaiser, PhD
11/06/2015 The Boston Harbor Association
11/06/2015 Cindy L. Christiansen, PhD
11/10/2015 Bill Deignan, Cambridge Community Development Department

MAB/ACC/acc

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

February 6, 2015

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
2012-2013 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2012-2013 Environmental Data Report
PROJECT MUNICIPALITY	: Boston / Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: December 10, 2014

As Secretary of Executive Office of Energy and Environmental Affairs (EEA), I hereby determine that the Environmental Data Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA) (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

Background

The environmental review process for Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of the Massachusetts Port Authority's (Massport) long-range planning process. The ESPR provides a "big picture" analysis of the environmental impacts of current and anticipated levels of activities, and presents an overall strategy to minimize impacts. The ESPR is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments associated with project-specific Environmental

Impact Reports (EIR). The ESPR is generally updated on a five-year basis; the most recent ESPR for the year 2011 was filed in April of 2013. Environmental Data Reports (EDRs) (formerly referred to as Annual Updates) are filed in the years between ESPRs. During the review of the 2011 ESPR, Massport requested that the 2012 and 2013 EDRs be combined into one document. The 2012-2013 EDR is the subject of this review. Additionally, this Certificate contains a Scope for the 2014 EDR.

The 2012-2013 EDR provides a comprehensive, cumulative analysis of the effects of all Logan Airport activities based on actual and predicted passenger activity and aircraft operation levels in 2012 and 2013, and presents environmental management plans for addressing areas of concern. The technical studies in the 2012-2013 EDR include reporting on and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality and environmental management. The 2012-2013 EDR updates and compares the data presented in the 2011 ESPR, and presents activity levels (including aircraft operations and passenger activity) and environmental conditions at Logan Airport for the calendar years 2012 and 2013. It also reports on the status of project mitigation.

Passenger levels at Logan Airport reached a new peak in 2013, exceeding the 2007 historic peak, while aircraft operations at Logan Airport remained well below the historic peak reached in 1998. The 2012-2013 EDR examines the effects of airlines operating much more efficiently with quieter fleets and flying more passengers per aircraft operation. As discussed in the 2011 ESPR, the 2012-2013 EDR anticipates further increases in activity levels and some increases in environmental impacts compared to recent years.

Scope for the 2014 EDR

General

The 2014 EDR should follow the general format of the 2012-2013 EDR status report. The 2014 EDR should include an Executive Summary and Introduction, similar to previous ESPRs and EDRs. Massport must provide background information on the environmental policies and planning that form the context of the environmental reporting, technical studies, and environmental mitigation initiatives at Logan Airport to provide context for reviewing agencies and the public. A1

The 2014 EDR should provide an update on conditions at Logan Airport for calendar year 2014, including passenger and aircraft operation activity levels. It should continue to serve as a background/context against which projects at Logan Airport can be evaluated. It should also report on the cumulative effects of Logan Airport operations and activities, compared to previous years, as appropriate. It should provide a status report on Massport's proposed planning initiatives, projects, and mitigation measures. A2

The technical studies in the 2014 EDR should include reporting on and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking. The 2014 EDR must also A3

respond to those issues explicitly noted in this Certificate and the comments received on the 2012-2013 EDR.

A distribution list for the 2014 EDR (indicating those receiving documents, CDs, or Notices of Availability) should be provided in the document. This section must also include copies of all ESPR and EDR Certificates issued since the 2004 Logan ESPR (issued on August 16, 2006) to provide context for reviewers. Supporting technical appendices should be provided as necessary. A4

Response to Comments

The 2014 EDR Responses to Comments section should address all of the substantive comments from the letters listed at the end of this Certificate. The Response to Comments chapter included in the 2012-2013 EDR is well-constructed and cross-referenced. I encourage Massport to use the same format in the 2014 EDR. A5

The majority of comments received on the 2012-2013 EDR focus on noise related issues, including measurement of noise, modeling of noise contours, and noise abatement, and emission reduction issues. In addition to responding to these comments, the 2014 EDR should continue to report on the refinements to noise tracking and abatement efforts. Massport should consult directly with individual commenters where appropriate. A6

Activity Levels

The Activity Levels chapter provides a solid analysis of major activity issues and the technical appendix contains useful and detailed information. This chapter presents aviation activity statistics for Logan Airport in 2012 and 2013. Logan Airport is New England's primary domestic and international airport, operating as an origin-destination airport, rather than a connecting hub for major airlines. In 2012, Logan Airport was the 23rd busiest commercial aviation facility in North America ranked by aircraft operations, and the 20th busiest in North America ranked by number of passengers. In 2013, Logan Airport was the 21st busiest commercial aviation facility in North America ranked by aircraft operations, and remained the 20th busiest in North America ranked by number of passengers.

The total number of air passengers at Logan Airport increased by 1.1 percent to 29.2 million in 2012 and by 3.4 percent to 30.2 million in 2013, compared to 28.9 million in 2011. The 2013 passenger level represents a new record high for Logan Airport. At the same time, the total number of aircraft operations fell from approximately 368,987 in 2011 to 354,869 in 2012, a decrease of 3.8 percent. In 2013, aircraft operations increased by 1.8 percent to 361,339. Despite the increase in airport operations from 2012 to 2013, aircraft operations at Logan Airport remained well below the 487,996 operations accommodated in 2000 and the historic peak of 507,449 operations reached in 1998. Passenger aircraft operations, which accounted for 91 percent of total aircraft operations, increased by 2.4 percent in 2013 after decreasing by 3.9 percent in 2012, compared to 2011 levels.

General aviation (GA) operations which is defined as aviation activity other than commercial airline activity, accounted for seven percent of total operations in 2013. GA decreased by 0.4 percent in 2012 and decreased by 5.1 percent in 2013. The 26,682 GA operations in 2013 remain below the 35,233 GA operations that Logan Airport handled in 2000.

Airline efficiency continued to increase as the average total number of passengers per aircraft operation increased from 78.3 percent in 2011 to 82.4 percent in 2012 and 83.6 percent in 2013. The average number of passengers per aircraft operation in 2012 and 2013 represented approximately 74 percent of average aircraft seat capacity. At Logan Airport, the increasing number of passengers per flight reflects a shift away from smaller aircraft and rising load factors because airlines have reduced or restricted capacity growth after several airline mergers.

Air cargo volumes, including shipments transported in the belly compartments of passenger aircraft, decreased from 562 million pounds in 2011 to 553 million pounds in 2012, a decline of 1.4 percent compared to 2011. Over the same period, all-cargo aircraft operations fell by 16.5 percent to 5,237 million pounds. All-cargo aircraft operations fell at a faster rate than cargo volumes, because all-cargo airlines introduced larger capacity aircraft into service at Logan Airport. In 2013 air cargo volumes increased by 0.8 percent to 558 million pounds and all-cargo operations increased by 3.2 percent to 5,403 million pounds, compared to 2012.

The 2014 EDR should report on airport activity levels and aircraft operations, including:

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Passenger activity levels;
- Cargo and mail activities;
- Compare 2014 aircraft operations, cargo/mail operations, and passenger activity levels to 2013 activity levels; and
- Report on national aviation trends in 2014 and compare to trends at Logan Airport.

A7

It should also report on Massport's activity level forecasts that will become the basis for the planning and impact sections that follow and for Massport's strategic planning initiatives for the future ESPR. Massport should address comments related to activity levels in the 2014 EDR. A8

Sustainability at Logan Airport

The 2012-2013 EDR describes Massport's airport wide sustainability goals. In October 2000, the Massport Board approved an Authority-wide Environmental Management Policy, which articulates Massport's commitment to protect the environment and to implement sustainable design principles. In October 2004, the Massport Sustainability Team produced the *Massachusetts Port Authority Sustainability Plan* (Sustainability Plan). The Environmental Management Policy is incorporated in the Sustainability Plan as Massport's long-term sustainability goal or vision.

The 2012-2013 EDR describes Massport's continued efforts including Massport-wide sustainability. In 2013, Massport was awarded a grant by the Federal Aviation Administration (FAA) to prepare a Sustainability Management Plan (SMP) for Logan Airport. The Logan

Airport SMP planning effort began in May 2013, and is expected to be completed in 2015. The 2012-2013 EDR indicates that the Logan Airport SMP is intended to promote and integrate sustainability, formulate a list of priority initiatives, and engage employees and tenants in the process. The 2012-2013 EDR provides an excellent overview of Massport's commitment to incorporate sustainability into all aspects of Massport's activities: Planning and Design; Construction; Operations, Maintenance and Management; and Monitoring of Environmental Performance. It also identifies specific practices to reduce impacts associated with construction and efforts to address energy intensity, percentage of renewable energy, and GHG reductions.

A specific example includes compliance with the Leading by Example Executive Order which requires state agencies to procure 15 percent of their electricity from renewable resources by 2012. The Leading by Example program has influenced Massport's own operations including its offices, heating plants, and garages resulting in Massport receiving the Leading by Example award in 2008. As part of the Leading by Example program, all new construction and major renovations over 20,000 square feet constructed by Commonwealth agencies must meet the Massachusetts LEED Plus green building standard established by the Massachusetts Sustainable Design Roundtable.

I commend Massport for its commitment and expect progress on the SMP will be incorporated into subsequent EDRs and ESPRs. The focus in the 2014 EDR should include reporting on data, identifying goals and priorities for specific Massport and tenant projects at Logan Airport that have undergone MEPA review to include energy efficiency/greenhouse gas reduction, water conservation, and waste management and recycling. A9

The 2014 EDR should report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review, including whether they are under construction or completed. The status of mitigation commitments made in the Section 61 Findings for the following projects should also be reported: A10

- West Garage/Central Garage (EEA #9790)
- International Gateway (EEA #9791)
- Logan Airside Improvements Planning Project (EEA #10458)
- Terminal A Replacement Project (EEA #12096)
- Southwest Service Area Redevelopment Program/Rental Car Center (EEA #14137)
- Logan Runway Safety Area Improvements Project (EEA #14442)

Planning

The Airport Planning chapter in the 2012-2013 EDR provides an overview of planning, construction, and permitting activities that occurred at Logan Airport in 2012 and 2013. It also describes future planning, construction, and permitting activities and initiatives. It includes the following Airport Projects:

- Southwest Service Area (SWSA) Redevelopment Program (EEA #14137);
- Logan Airport Runway Safety Area (RSA) Improvements Project at Runway Ends 33L and 22R (EEA #14442);

- Logan Airport Runway 33L Light Pier Replacement Project (EEA #14442);
- Green Bus Depot (EEA #14629);
- Martin A. Coughlin (East Boston-Chelsea) Bypass Project (EEA #14661);
- Renovations and Improvements at Terminal B;
- Terminal B Garage Improvement Project;
- North Service Area Roadway Corridor Project;
- Greenway Connector Project a pedestrian/bicycle path connecting the Bremen Street Park path to the future City of Boston pedestrian/bicycle path; and
- Hangar Upgrade Projects.

At the end of 2013, Massport initiated the Disaster and Infrastructure Resiliency Planning (DIRP) Study for Logan Airport, the Port of Boston, and Massport's waterfront assets in South and East Boston according to the 2012-2013 EDR. The DIRP Study includes a hazard analysis, modeling projected sea-level rise and storm surge, and projections of temperature and precipitation and anticipated increases in extreme weather events. The study is nearing completion. The 2014 EDR should address the DIRP Study and identify which recommendations Massport will implement in the short term to increase the resiliency of its facilities to the potential effects of climate change. A11

Massport is in the process of developing a long-term parking management plan for Logan Airport. The Long-Term Parking Management Plan will lay out a multi-part strategy for efficiently managing parking supply, pricing, and operations – both at Logan Airport and at off-Airport locations controlled by Massport – to maximize access for transit and shared-ride vehicles while minimizing both drive-and-park and pick-up/drop-off modes. The 2014 EDR should provide updates on this plan. A12

The 2014 EDR should also continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport also must accommodate and guide tenant development. Therefore, the 2014 EDR should also describe the status of planning initiatives for the following areas: A13

- Roadway Corridor Project;
- Airport Parking;
- Terminal Area;
- Airside Area;
- Service and Cargo Areas; and
- Airport Buffers and Landscaping.

The 2014 EDR should provide a status report on long-range planning activities. This chapter should include the status and effectiveness of the ground access changes, including roadway and parking projects, that will consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on external streets in adjacent neighborhoods. A14

Regional Transportation

The 2012-2013 EDR describes activity levels at New England's regional airports in 2012 and 2013 and provides an update on regional planning activities, including long-range transportation efforts.

Overall, aviation activity at New England's regional airports decreased in 2012 and 2013. In 2012, the total number of air passengers utilizing New England's commercial service airports, including Logan Airport, decreased by 1.3 percent from 44.7 million in 2011 to 44.1 million annual air passengers. The decline in the region's passenger traffic largely reflects airline service reductions at many of the regional airports in 2012. Airlines have attempted to maintain tighter capacity control, which has resulted in ongoing service cuts at various secondary and tertiary airports across the nation. While passenger traffic at Logan Airport increased slightly in 2012, reduced passenger levels at regional airports resulted in an overall decline for the region. In 2013, however, overall passenger traffic at New England commercial airports recovered somewhat, increasing 2.8 percent from 44.1 million to 45.4 million passengers. Passenger traffic at New England airports in 2013 was the highest since the economic downturn in 2008. In 2013, total passenger traffic at the regional airports increased 1.6 percent from the previous year, while passenger traffic at Logan Airport increased by 3.4 percent.

The 2014 EDR should describe Logan Airport's role in the region's intermodal transportation system by reporting on the following:

Regional Airports

- 2014 regional airport operations, passenger activity levels, and schedule data within an historical context;
- Status of plans and new improvements as provided by the regional airport authorities;
- Ground access improvements; and
- Role of the Worcester Regional Airport and Hanscom Field in the regional aviation system and Massport's efforts to promote these airports.

Regional Transportation System

- Massport's role in managing the regional transportation facilities within the restructured Massachusetts Department of Transportation (MassDOT);
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership.

Ground Access to and from Logan Airport

The 2012-2013 EDR reports on transit ridership, roadways, traffic volumes, and parking for both 2012 and 2013. Specifically, the average daily vehicular traffic on Airport roadways decreased by 0.2 percent from 99,449 in 2011 to 99,281 in 2012, and then increased by 3.5 percent to 102,771 between 2012 and 2013. The 2012-2013 EDR also updates information on the Logan Parking Freeze limit which is set at 21,088, of which 18,415 are dedicated to commercial

parking spaces and 2,673 are dedicated to employee parking spaces. The EDR indicates that Massport continued to be in full compliance with the Parking Freeze throughout 2012 and 2013.

The 2012-2013 EDR includes key findings for ground access activity to and from the Airport which include:

- Massachusetts Bay Transportation Authority (MBTA) Silver Line bus boardings at the Airport continued to grow, based on ridership estimates.
- In 2012, Blue Line transit boardings at Airport Station increased about seven percent over 2011 levels. In 2013, MBTA Blue Line ridership increased six percent over 2012 levels.
- In 2012, ridership levels on all types of water transportation to the Airport remained flat in comparison to the previous year. Ridership on the MBTA ferry continues to decline, while private water taxi use has grown slightly since 2007. In 2013, ridership on private water taxis increased by three percent.
- In 2012, air passengers using Logan Express bus service increased 10 percent compared to 2011 levels; employee use of Logan Express increased by 16 percent and non-employee passengers increased nearly five percent. In 2013, non-employee passenger ridership increased nearly eight percent over 2012 levels, and employee passenger activity increased almost two percent.
- In September 2013, Massport solicited an operator for a Back Bay express shuttle bus service, which commenced in April 2014. The Back Bay Logan Express, provides improved service to those transit riders who are affected by the two-year Government Center MBTA Station closure and increases high occupancy vehicle (HOV) use from the inner Boston area.

The 2014 EDR should report on the following conditions and provide a discussion of analysis in 2014 and compare them to 2013:

- Detailed description of compliance with Logan Airport Parking Freeze;
- High occupancy vehicle (HOV) ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express);
- Massport's cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line and Silver Line;
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport vehicle miles traveled (VMT);
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning; and
- Results of the 2013 Logan Airport Passenger Survey.
- Massport's target HOV mode share along with incentives; and,
- Non-Airport through-traffic;

Noise Abatement

The 2012-2013 EDR updates the status of the noise environment at Logan Airport in 2012 and 2013, and describes Massport's efforts to reduce noise levels. Many of the issues raised in the noise analysis are ongoing and require continuous monitoring. The 2014 EDR should address the noise issues raised by numerous commenters on the 2012-2013 EDR

Compared to 2011, the 2012 Day-Night Average Sound Level (DNL) 65-decibel (dB) contours were slightly larger in East Boston, Revere, South Boston, and Winthrop and smaller over Boston Harbor towards Long Island and south towards Columbia Point. The 2012 contours remained substantially smaller than the 2000 contours. There are several factors that influenced the contour changes, including: Runway 15R-33L, the nighttime noise abatement runway, was temporarily closed from June 16, 2012 through October 2, 2012 to allow for the second and final period of construction of the enhanced Runway 33L RSA. There were also partial construction closures of the runway before and after this period. Typically, this runway is used during these periods for head-to-head operations (arrivals to Runway 33L and departures from Runway 15R) at night, which keeps air traffic over Boston Harbor, and away from the community. The 2012 RSA construction closure was extended for longer period than in 2011, which also extended the use of other runways for nighttime operations during 2012. During this period, night operations primarily used Runway 22R and Runway 9 for departures and Runway 4R, 27, and 22L for arrivals.

Compared to 2012, the 2013 DNL 65 dB contours were slightly larger in East Boston and slightly smaller in Revere, South Boston, and Winthrop. The 2013 contours remained substantially smaller than the 2000 contours. There are several factors that influenced the contour changes, including:

- Runway use in 2013 was reflective of a typical year (return to pre-construction conditions), with an increased use (compared to 2012) of Runway 15R-33L and Runway 27;
- The availability of all runway configurations in 2013, resulted in lower levels of arrivals to Runways 22L, 27, and 4R;
- Due to the runway closure, the overall number of people exposed to DNL values greater than 65 dB increased to 4,736 people in 2012 from 3,947 people in 2011 (an increase of 789 people); and
- In 2013 with runway use back to pre-construction patterns, the overall number of people exposed to DNL values greater than 65 dB decreased to 4,307 people in 2013 from 4,736 people in 2012 (a decrease of 429 people).

The number of people residing within the DNL 70 dB contour increased from 130 people in 2011 to 200 people in 2012 and returned to 130 people in 2013. These levels are still well below the number of people exposed in the year 2000 when 17,745 people were exposed to DNL noise levels greater than 65 dB and 1,551 people were exposed to DNL levels greater than 70 dB. All of the residences exposed to levels greater than DNL 65 dB in 2012 and 2013 have been eligible to participate in Massport's residential sound insulation program (RSIP). Participation in the program is voluntary and Massport has provided sound insulation to all of homeowners who

have chosen to participate. An additional 76 residential units received sound insulation treatment in 2013 bringing the program total to 11,409 residential units. Massport will continue to seek funding for this program.

Massport is participating in a FAA aircraft noise study as part of the Airside Improvement Project mitigation. The primary focus of the Boston Logan Airport Noise Study (BLANS) is to determine viable ways to reduce noise from aircraft operations to and from Logan Airport without diminishing airport safety and efficiency. The Runway Navigation (RNAV) departure portions of Phase 1 of the project, first implemented in 2010, continued to be utilized in 2012 and 2013. The 2012-2013 EDR detailed the Flight Track Monitoring reports in Appendix of Noise Abatement.

The information in the Noise Abatement chapter is very informative and I encourage Massport to continue with detailed analysis in the 2014 EDR. I strongly advise Massport to consider and address the comments on noise and noise related issues.

The 2014 EDR should provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2014 conditions and compare those conditions to those of 2013 for the following:

- Fleet Mix, including Stage II, Recertified (Hushkitted) Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft;
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals);
- Preferential runway advisory system (PRAS) tracking; and
- Flight tracks.

A17

The 2014 EDR should also report on 2014 conditions and compare those to 2013 conditions for the following noise indicators:

- Using the FAA's most current version of the Integrated Noise Model (INM), and RealContoursTM and RealProfilesTM, produce an accurate set of Day-Night Sound Level (DNL) noise contours.
- Update on FAA's combined air quality and noise modeling tool (Aviation Environmental Design Tool - AEDT)
- Noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the use of RealContoursTM and RealProfilesTM;
- Cumulative Noise Index (CNI);
- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels;
- Installation and benefits of the new noise monitoring system; and
- Flight track monitoring noise quarterly reports.

A18

The 2014 EDR should also report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) study, and provide a status update on the new noise and operations monitoring system. A19

Air Quality/Emissions Reduction

The 2012-2013 EDR provides an overview of airport-related air quality issues in 2012 and 2013 and also efforts to reduce emissions. The air quality modeling reported in 2012-2013 EDR is based on aircraft operations, fleet mix characteristics, and airfield taxiing times combined with ground support equipment (GSE) usage, motor vehicle traffic volumes, and stationary source utilization rates. Motor vehicle emissions for the 2012 analysis were obtained from the United States Environmental Protection Agency's (EPA's) MOBILE model (MOBILE6.2.03) combined with MassDEP-recommended motor vehicle fleet mix data, operating conditions, and other Massachusetts-specific input parameters. The most up-to-date EPA mobile model, Motor Vehicle Emission Simulator (MOVES), was used to develop 2013 motor vehicle emission factors. For comparative purposes, both MOBILE and MOVES were used to generate the 2013 motor vehicle emission factors.

The following is a summary of modeled air quality conditions for Logan Airport in the 2012 to 2013 time-period:

- Total volatile organic compound (VOC) emissions in 2012 were 1,080 kilograms per day (kg/day), or approximately three percent lower than 2011 levels. By comparison, total VOC emissions in 2013 were 1,138 kg/day, or 5 percent higher than 2012 levels. For comparison, total VOC emissions were 1,777 kg/day in 2000.
- Total emissions of oxides of nitrogen (NO_x) in 2012 were 4,099 kg/day, or less than one percent higher than 2011 levels. However, total emissions of NO_x in 2013 were 4,020 kg/day, or two percent lower than 2012 levels. For comparison, total NO_x emissions were 5,707 kg/day in 2000.
- Total emissions of carbon monoxide (CO) in 2012 were 6,739 kg/day, or three percent lower than 2011 levels. However, total emissions of CO in 2013 were 7,340 kg/day, or nine percent higher than 2012 levels. For comparison, total CO emissions were 13,111 kg/day in 2000.
- Total emissions of particulate matter ($PM)_{10}/PM_{2.5}$ increased in 2012 by approximately seven percent to 72 kg/day compared to 2011 levels. This particular increase is unique and is mostly attributable to a change the MOBILE6.2.03 model. Total modeled emissions of $PM_{10}/PM_{2.5}$ again increased in 2013 by approximately 28 percent to 92 kg/day compared to 2012 levels. This increase is primarily attributable to the updated computer modeling (i.e., Emissions and Dispersion Modeling System [EDMS] and MassDEP-preferred model –MOVES) used to calculate aircraft and motor vehicle emissions.
- With respect to Massport's Air Quality Initiative (AQI) 1999 benchmark, total NO_x emissions in 2012 were 698 tons per year (tpy) lower than the benchmark and in 2013 emissions were 730 tpy lower than the benchmark. This represents an overall decrease of 31 percent in NO_x emissions since 1999. For comparison, total NO_x emissions in 2000 were 51 tpy lower than the benchmark or a decrease of 2 percent since 1999.

The year 2013 marks the seventh consecutive year in which Massport has voluntarily prepared a greenhouse gas (GHG) emissions inventory for the EDR/ESPR. The 2012 and 2013 GHG emission inventory was again prepared following methodological guidance by the Transportation Research Board's (TRB) Airport Cooperative Research Program (ACRP). Total Logan Airport GHG emissions in 2012 were approximately three percent lower than 2011 levels primarily due to lower fuel consumption by stationary sources. Total Logan Airport GHG emissions in 2013 were approximately six percent higher than 2012 levels primarily due to the increase in usage of passenger ground access vehicles on off-airport roadways. In 2012, Massport-related emissions represented 10 percent of total GHG emissions at the Airport; tenant-based emissions represented approximately 69 percent; electrical consumption represented 14 percent; and passenger vehicle emissions represented six percent. Similarly, in 2013, Massport-related emissions represented 13 percent of total GHG emissions at the Airport, tenant-based emissions represented approximately 66 percent, electrical consumption represented 10 percent, and passenger vehicle emissions represented 10 percent.

The 2014 EDR should include an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The 2014 EDR should provide discussion on progress on the national and international levels to decrease air emissions. It should also include analysis methodologies and assumptions and report on 2014 conditions using the most recent versions of the EDMS and MOVES models. The 2014 EDR should include an emissions inventory for CO, NO_x, VOCs, and PM. It should include NO_2 monitoring and identify NO_x emissions by airline. A20

The 2014 EDR should also report on the following AQI for 2014:

- AQI Emissions Monitoring and Tracking;
- Massport's and Tenant's Alternative Fuel Vehicle Programs; and
- The status of Logan Airport air quality studies undertaken by Massport or others, as available.

A21

Massport has also committed to include an inventory of GHG emissions from Logan Airport in 2014. GHG emissions should be quantified for aircraft, GSE, motor vehicles and stationary sources using emission factors and methodologies outlined in the MEPA Greenhouse Gas Emissions Policy and Protocol. The results of the 2014 GHG emissions inventory should be compared to the 2013 results. This chapter should also include an update on Massport's efforts to encourage the use of single engine taxiing under safe conditions. A22

Water Quality/Environmental Compliance

The 2012-2013 EDR describes Massport's ongoing environmental management activities including National Pollutant Discharge Elimination System (NPDES) compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management.

The 2014 EDR should report on the 2014 status of:

- NPDES Permit and monitoring results for Logan Airport's outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- MCP activities;
- Tank management;
- Update on the environmental management plan; and
- Fuel spill prevention.

It should also identify any planned stormwater management improvements.

Conclusion

I have determined that the 2012-2013 EDR for Logan Airport has adequately compiled with MEPA. Massport may prepare a 2014 EDR for submission in 2015 consistent with the scope included in this Certificate.

February 6, 2015
Date

Matthew A. Beaton

Comments received:

01/14/2015 Frank J. Ciano
01/26/2015 Cindy L. Christiansen
01/26/2015 City of Somerville, Mayor Joseph Curtatone
01/27/2015 The Boston Harbor Association
01/27/2015 Nancy S. Timmerman
02/02/2015 Massachusetts Department of Public Health

MAB/ACC/acc

This Page Intentionally Left Blank

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Deval L. Patrick
GOVERNOR

Timothy P. Murray
LIEUTENANT GOVERNOR

Richard K. Sullivan Jr.
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1181
http://www.mass.gov/envir

June 14, 2013

CERTIFICATE OF THE SECRETARY OF ENVIRONMENTAL AFFAIRS
ON THE
2011 LOGAN AIRPORT ENVIRONMENTAL STATUS AND PLANNING REPORT

PROJECT NAME	: 2011 Environmental Status and Planning Report
PROJECT MUNICIPALITY	: Boston and Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: April 24, 2013

As Secretary of Environmental Affairs, I hereby determine that the Environmental Status and Planning Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (G. L. c. 30, ss. 61-62H) and with its implementing regulations (301 CMR 11.00). A-1

The environmental review process for Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of Massport's long range planning. The ESPR provides a "big picture" analysis of environmental impacts associated with current and anticipated levels of activities, and presents an overall mitigation strategy aimed at avoiding increases in such impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific Environmental Impact Reports (EIR). The ESPR is generally updated on a five year basis, with much less detailed Environmental Data Reports (EDR) (formerly Annual Updates) filed in the years between ESPRs. The 2011 ESPR is the subject of this review. In addition, Massport has requested to combine the 2012-2013 EDRs into one document. I have considered and granted this request. This Certificate also contains a Scope for the 2012-2013 EDR. A-2

In general, the ESPR has responded to the scope. In particular, the 2011 ESPR contains a wealth of useful data on activity levels and impacts, and lays out a forecast for trends in the future years. The technical studies in the 2011 ESPR include reporting on and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking. The 2011 ESPR updates and compares the data presented in the 2010 EDR, and presents activity levels (including aircraft operations and passenger activity) and environmental conditions at Logan Airport for calendar year 2011. In addition to the annual report on 2011 conditions, two other primary functions of this 2011 ESPR are to provide a discussion of future activity levels at Logan Airport through the year 2030 based on an updated forecast, and to predict the associated potential environmental conditions at the Airport in 2030. The 2011 ESPR also presents historical data on the environmental conditions at Logan Airport dating back to 1990 in instances where historical information is available. Historical data are included in the technical appendices. Overall the 2011 ESPR provides a comprehensive, cumulative analysis of the effects of all Logan Airport activities based on actual and predicted passenger activity and aircraft operation levels in 2011 and 2030 and presents environmental management plans for addressing areas of environmental concern. A-3

The majority of comments received on the 2011 ESPR focused on noise issues, including measurement of noise, modeling of noise contours, and noise abatement. In addition to responding to these comments, the 2012-2013 EDR should also report on the progress and other refinements for tracking noise and abatement efforts, as further described in the Scope below.

Background

In 1979, the Secretary of the Executive Office of Environmental Affairs issued a Certificate requiring Massport to define, evaluate, and disclose, every three years, the impact of long-term growth at the airport through a Generic Environmental Impact Report (GEIR). The Certificate also required the submission of interim Annual Updates to provide data on conditions for the years between the GEIRs. The GEIR provided projections of environmental conditions where the cumulative effects of individual projects could be understood. The Secretary's Certificate on the *1997 Annual Update* proposed a revised environmental review process for Logan Airport. As a result, Massport evaluates the cumulative impacts associated with airport activities through preparation of an ESPR every five years and provides data updates annually through the EDRs.

Review of the 2011 ESPR and Scope for the 2012-2013 EDR

Framework for the 2011 ESPR

Massport has adopted a new, long-term forecast for the long-range planning horizon,

2030. Previous forecasts for the 1999 ESPR and the 2004 ESPR forecasts anticipated that Logan Airport would be handling 37.5 million annual passengers in 2015 and 42.8 million passengers in 2020, respectively. The 2011 ESPR revisits previous forecasts and revises them based on current and predicted conditions, and to consider a more distant time horizon.

For this 2011 ESPR, Massport updated the Logan Airport long-range forecast with 2015, 2020, and 2030 as the forecast years. Three scenarios were also developed (Low, Moderate, and High). Massport views the Moderate forecast scenario as the most likely forecast of future activity levels at Logan Airport. Massport's forecast under the Moderate scenario predicts that there will be 39.8 million passengers using Logan Airport in 2030. The updated forecast takes into account slower-than-anticipated passenger growth (compared to previous forecasts), the increasing efficiency of aircraft (higher passenger load factors), and fleet mix trends, including a growing prevalence of larger capacity jet aircraft. This 2011 ESPR examines both airside and landside activities, including planned Massport projects, and projects being carried out by others that affect the Airport, such as the FAA's Boston Logan Airport Noise Study (BLANS). Future year projections incorporate available information about projects that have undergone or are currently under MEPA review.

Cumulative analysis of airport activities are based on actual and projected passenger activity levels, aircraft operations, and the facilities and services needed to serve them. Analysis conditions for current and future years are used to assess environmental conditions and to develop, evaluate, and adjust environmental management actions.

General

The 2012-2013 EDR should follow the general format of the 2010 EDR status report on Massport's planning initiatives, projects, and mitigation measures. The 2012-2013 EDR should include an Executive Summary and Introduction, similar to previous ESPRs and EDRs. Massport must provide necessary background information to allow reviewing agencies and the public to understand the environmental policies and planning which form the context of the environmental reporting, technical studies, and environmental mitigation initiatives at Logan Airport. A-4

Specifically, the 2012-2013 EDR should provide an update on conditions at Logan Airport for calendar year 2012 and 2013. The EDR should continue to serve as a background/context against which projects at Logan Airport can be evaluated. It should also report on the cumulative effects of Logan Airport operations and activities, compared to previous years, as appropriate. A-5

The 2012-2013 EDR should report on 2012 and 2013 passenger and aircraft operation activity levels. This will be followed by a status report on Massport's proposed planning initiatives and projects and mitigation. In this way, Massport should provide the necessary background information to allow the reviewer to understand the environmental policies and A-6

planning which form the context of the environmental reporting, technical studies, and environmental mitigation initiatives at Logan Airport. A-7 cont.

The technical studies in the 2012-2013 EDR should include reporting on and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking. The 2012-2013 EDR must also respond to those issues explicitly noted in this Certificate and the comments received on the 2011 ESPR. A-8

A distribution list for the 2012-2013 EDR (indicating those receiving documents, CDs, or Notices of Availability) should be provided in the document. This section must also include copies of all ESPR and EDR Certificates issued since the 2004 Logan Environmental Status and Planning Report (issued on August 16, 2006) to provide context for reviewers. Supporting technical appendices should be provided as necessary. A-9

Responses to Comments

The 2012-2013 EDR must include responses to comments that address all of the substantive comments from the letters listed at the end of this Certificate. The responses to comments included in the 2011 ESPR is well-constructed and cross-referenced. Massport may follow the same format in addressing comments in the 2012-2013 EDR. A-10

The majority of comments received on the 2011 ESPR focus on noise related issues, including measurement of noise, modeling of noise contours, and noise abatement, and emission reduction issues. In addition to responding to these comments, the 2012-2013 EDR should continue to report on the refinements to noise tracking and abatement efforts. Massport should consult directly with individual commenters where appropriate. A-11

Activity Levels

The Activity Levels chapter provides a solid analysis of major activity issues and the technical appendix contains useful and detailed information. This section in the 2011 ESPR specifically presents aviation activity statistics for Logan Airport in 2011 and compares activity levels to the prior year. The specific activity measures discussed include air passengers, aircraft operations, fleet mix, and cargo/mail volumes. This chapters also provides Massport's long-range 2030 aviation forecast for Logan Airport.

The 2012-2013 EDR must report on airport activity levels, including information on aircraft operations, including fleet mix, passenger activity levels, and cargo and mail operations. A primary purpose of this section of the 2012-2013 EDR will be to report on airport activity levels for 2012 and 2013, including: A-12

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;

- Passenger activity levels;
- Cargo and mail activities;
- Compare 2012 and 2013 aircraft operations, cargo/mail operations, and passenger activity levels to 2011 activity levels; and
- Report on national aviation trends in 2012/2013 and compare to trends at Logan Airport.

A-12 cont.

It should also report on Massport's activity level forecasts that will become the basis for the planning and impact sections that follow and for Massport's strategic planning initiatives over the next few years. In addition to reporting the analysis of major activity issues, I advise Massport to consider and attempt to address all comments related to activity levels in the 2010 EDR.

A-13

A-14

Planning

The Airport Planning chapter in the 2011 ESPR provides an overview of planning, construction, and permitting activities that occurred at Logan Airport in 2011. It also describes known future planning, construction, and permitting activities and initiatives.

The 2012-2013 EDR should continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport also must accommodate and guide tenant development. Therefore, the 2012-2013 EDR should describe the status of planning initiatives for the following areas:

- Roadway Corridor Project;
- Airport Parking;
- Terminal Area;
- Airside Area;
- Service and Cargo Areas; and
- Airport Buffers and Landscaping.

A-15

The 2012-2013 EDR should continue to assess the status of long-range planning activities. The chapter should report on the status of public works projects implemented by other agencies within the boundaries of Logan Airport. The chapter will also report on the status and effectiveness of the ground access related changes including roadway and parking projects, which consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on external streets in adjacent neighborhoods.

A-16

A-17

Regional Transportation

In general, the 2011 ESPR has met the requirements with respect to regional transportation issues. It describes activity levels at New England's regional airports in 2011 and updates recent regional planning activities.

A-18

Overall, aviation activity at New England's regional airports increased in 2011, because the regional airports experienced a modest recovery after the 2008/2009 Economic Recession. Highlights for the regional airports and the status of long-range regional transportation planning efforts in the region which are relevant to Massport's three airports as well as the regional transportation network are provided in the 2011 ESPR.

The 2012-2013 EDR should describe Logan Airport's role in the region's intermodal transportation system by reporting on the following:

Regional Airports

- 2012 and 2013 regional airport operations, passenger activity levels, and schedule data within an historical context;
- Status of plans and new improvements as provided by the regional airport authorities;
- Ground access improvements to the regional airports; and
- The role that Worcester Regional Airport and Hanscom Field play in the regional aviation system and Massport's efforts to promote these airports.

A-19

Regional Transportation System

- Massport's role in managing the regional transportation facilities within the restructured Massachusetts Department of Transportation (MassDOT);
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership.

Ground Transportation

The 2011 ESPR reported on transit ridership, roadways, traffic volumes and parking for 2011. It also provides forecasts for traffic volumes, parking, and VMT for the year 2030.

The 2012-2013 EDR should report on 2012 and 2013 conditions and provide a comparison of 2012 and 2013 findings to those of 2011 for the following:

- Detailed description of compliance with Logan Airport Parking Freeze;
- High occupancy vehicle (HOV) ridership (including Blue Line, Silver Line, Scheduled, Unscheduled, Water Transportation, and Logan Express);
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport vehicle miles traveled (VMT);
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning; and

A-20

- Results of the 2013 Logan Airport Passenger Survey.

The 2012-2013 EDR should also present a discussion of the following topics:

- Definition of HOV;
- Massport's target HOV mode share along with incentives;
- Non-Airport through-traffic;
- Massport's cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line and Silver Line;
- Report on Logan Express usage and efforts to increase capacity and usage;
- Progress on enhancing water transportation to and from Logan Airport;
- Progress on rental car consolidation;
- Report on results of ground access study; and
- Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.

A-20 cont.

Noise

The 2011 ESPR updates the status of the noise environment at Logan Airport in 2011, and describes Massport's efforts to reduce noise levels. It also provides noise contour population counts for 2030. The technical appendix contains useful and detailed information, while the main document provides a solid analysis of major noise issues. Many of the issues raised in the noise analysis are ongoing and require continuous monitoring. The future 2012-2013 EDR represents an appropriate forum to serve this updating function and to address the noise issues raised by numerous commenters on the 2011 ESPR.

A-21

In 2011 the following changes occurred in the Airport noise environment:

- Compared to 2010, the 2011 DNL decibel (dB) contours were smaller in East Boston and over Boston Harbor toward Hull. The DNL 65 dB contour was slightly larger in Revere, South Boston, and in most of Winthrop for 2011.
- The overall number of people exposed to DNL values greater than 65 dB increased to 3,947 people in 2011 from 3,830 people in 2010 (an increase of 117 people). The number of people residing within the DNL 70 dB contour remained at 130 people. These levels are well below the numbers of people exposed in the year 2000 when 17,745 people were exposed to DNL noise levels greater than 65 dB and 1,551 people were exposed to DNL levels greater than 70 dB.
- In 2011, Massport provided sound insulation to 114 homes, 84 percent of which were in Chelsea. The focus of the program in Chelsea was to fulfill federal and state mitigation commitments related to the opening of Runway 14-32. Since the inception of Massport's residential sound insulation program (RSIP), 11,333 homes have received sound insulation treatment in East Boston, South Boston, Winthrop, Revere, and Chelsea.

Based on the 2030 forecast of aircraft operations and expected aircraft fleet mix, the following conditions are expected in 2030:

- There is forecast to be a larger number of operations and a higher percent of jet fleet activity than in 2011. The higher level of operations is not a capacity challenge as the Airport has operated in the past with over 1,300 operations per day.
- The 2030 fleet mix consists of 81 percent commercial jets whereas the 2011 fleet mix consists of 78 percent commercial jets. The 2000 fleet mix had a lower proportion of commercial jets at 62 percent of the fleet.
- Total operations are expected to increase by 29 percent or 290 operations per day from 2011 to 2030, from 1,011 operations per day in 2011 to 1,301 operations per day in 2030. Compared to 2000, which is the last year that Logan Airport had over 1,300 daily operations, 2030 is forecasted to have 54 fewer daily operations (1,355 in 2000 and 1,301 in 2030). Daytime commercial operations are projected to increase by 254 operations per day from 819 in 2011 to 1,073 in 2030, however this is still fewer than the 1,142 daytime operations in 2000. Nighttime commercial operations are projected to increase from 114 in 2011 to 154 in 2030. This is an increase compared to 2000 when 126 daily operations occurred at night.
- The 2030 operations forecast produced a larger set of DNL noise contours with the number of people exposed to noise levels greater than DNL 65 dB increasing from 3,947 in 2011 to 12,211 people in 2030. This is still significantly fewer than the number of people exposed in 2000 (17,745 people). The number of people within the DNL 70 dB is also projected to increase from 130 in 2011 to 352 people in 2030 but still remaining well below the 1,551 people within the DNL 70 dB in 2000. All of the residences within the forecasted 2030 DNL 65 dB contour are in areas where Massport has implemented its sound insulation program.

A-22

The information in this chapter is very informative and I encourage Massport to continue with detailed analysis in the 2012-2013 EDR. I strongly advise Massport to consider and address the comments on noise and noise related issues.

A-23

The 2012-2013 EDR should provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2012 and 2013 conditions and compare those conditions to those of 2011 for the following:

- Fleet Mix, including Stage II, Recertified (Hushkitted) Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft;
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals);
- Preferential runway advisory system (PRAS) tracking; and
- Flight tracks.

The 2012-2013 EDR should also report on 2012 and 2013 conditions and compare those to 2011 conditions for the following noise indicators:

- Using the Federal Aviation Administration's (FAA) most current version of the Integrated Noise Model (INM), and RealContoursTM and RealProfilesTM, produce an accurate set of Day-Night Sound Level (DNL) noise contours. Adjustments made to account for over-water sound propagation and the propagation of sound to areas of higher terrain will be reported;
- Noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the use of RealContoursTM and RealProfilesTM;
- Cumulative Noise Index (CNI);
- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels;
- Installation and benefits of the new noise monitoring system; and
- Flight track monitoring noise quarterly reports.

A-23 cont.

The 2012-2013 EDR should also report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) study, and provide a status update on the new noise and operations monitoring system.

A-24

Air Quality

The 2011 ESPR provides an overview of airport-related air quality issues in 2011 and efforts to reduce emissions. It also predicts emission levels for 2030. Overall total volatile organic compounds (VOC) emissions were 1,109 kilograms per day (kg/day), or 9 percent higher than 2010 levels, but still follow a long-range (i.e., a period of over 20 years) downward trend decreasing by almost 76 percent since 1990. This one-year increase is primarily due to the increase in landing and takeoff operations (LTOs) when compared to 2010 (176,322 LTOs in 2010 and 184,494 LTOs in 2011). Total emissions of oxides of nitrogen (NOX) were 4,077 kg/day, or 2 percent higher than 2010 levels. In 2011, total NOx emissions at Logan Airport were approximately 29 percent lower than 2000 levels. Also, total NOx emissions in 2011 were 707 tons per year (tpy) lower than Massport's 1999 Air Quality Initiative (AQI) benchmark. This represents an overall decrease of 30 percent in NOx emissions since 1999. Total emissions of carbon monoxide (CO) were 6,919 kg/day, or 3 percent lower than 2010 levels and 53 percent lower than 2000 levels; following the same long-range downward trend as VOCs and NOx. Total emissions of particulate matter (PM10/PM2.5) associated with Logan Airport increased in 2011 by approximately 5 percent to 67 kg/day compared to 2010 levels, but still following a long-range downward trend decreasing by 19 percent since 2005 (2005 is the first year that PM10/PM2.5 emissions were reported). This one-year increase is mostly attributable to the corresponding increase in stationary source use, particularly snow melters in conjunction with the unusually heavy snowfall in early 2011.

Since 1999, there has been a continuing trend of decreasing nitrogen dioxide (NO2) concentrations at both the Massport and Massachusetts Department of Environmental Protection (MassDEP) monitoring sites located in the vicinity of Logan Airport. In addition, the annual NO2 concentrations at all monitoring locations in 2011 continued to be well within the National Ambient Air Quality Standards (NAAQS) for NO2. The NO2 monitoring program was discontinued in 2012. Massport's Air Quality Monitoring Study is now complete, having collected data on a variety of ambient air pollutants over a two-year period as a means of assessing any air quality changes attributable to the operation of the Centerfield Taxiway which was completed in 2009. The findings from this Study will be submitted to MassDEP in 2013, and reported in the next Logan Airport EDR.

A-25

2011 marks the fifth consecutive year in which Massport has voluntarily prepared a greenhouse gas (GHG) emissions inventory for the EDR/ESPR. The 2011 GHG emission inventory was prepared following methodological guidance by the Transportation Research Board's (TRB) Airport Cooperative Research Program (ACRP). The 2011 inventory assigns GHG emissions based on ownership or control (whether it is controlled by Massport, the airlines or other airport tenants, or the general public). Total Logan Airport GHG emissions in 2011 were 5 percent higher than 2010 levels primarily due to the increase in aircraft operations and passenger vehicles accessing the Airport. Massport-related emissions represent only 12 percent of total GHG emissions at the Airport, tenant-based emissions represent approximately 68 percent, electrical consumption represents 14 percent; and passenger vehicle emissions represent 6 percent. This inventory is one of the three GHG emissions inventories Massport prepares annually; however, the other two only comprise stationary sources of GHGs and are filed with MassDEP and the U.S. Environmental Protection Agency (EPA) respectively.

The 2012-2013 EDR should include an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The chapter should provide discussion on progress on the national and international levels to decrease air emissions to provide context for this chapter. The chapter will also discuss analysis methodologies and assumptions and report on 2012 and 2013 conditions using the most recent versions of the Emissions Dispersion Modeling System (EDMS) and MOBILE motor vehicle emissions. The 2012-2013 EDR should include:

A-26

- Emissions inventory for carbon monoxide (CO)
- Emissions inventory for oxides of nitrogen (NOx)
- Emissions inventory for volatile organic compounds (VOCs)
- Emissions inventory for particulate matter (PM)
- Nitrogen dioxide (NO2) monitoring
- NOx emissions by airline

A-27

The 2012-2013 EDR should also report on the following air quality initiatives (AQI) for 2012 and 2013:

A-28

- Air Quality Initiative Tracking;

- Massport's and Tenant's Alternative Fuel Vehicle Programs; and
- The status of Logan Airport air quality studies undertaken by Massport or others, as available.

A-28 cont.

Massport has also committed to include an inventory of greenhouse gas (GHG) emissions from Logan Airport in 2012 and 2013. GHG emissions should be quantified for aircraft, ground service equipment (GSE), motor vehicles and stationary sources using emission factors and methodologies outlined in the MEPA Greenhouse Gas Emissions Policy and Protocol. The results of the 2012 and 2013 GHG emissions inventory should be compared to the 2011 results. This chapter should also include an update on Massport's efforts to encourage the use of single engine taxiing under safe conditions.

A-29

A-30

Water Quality/Environmental Compliance

The 2011 ESPR describes Massport's ongoing environmental management activities including National Pollutant Discharge Elimination System (NPDES) compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management.

The 2012-2013 EDR should report on the 2012/2013 status of:

- National Pollutant Discharge Elimination System (NPDES) Permit and monitoring results for Logan Airport's outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- Massachusetts Contingency Plan (MCP) Activities;
- Tank management;
- Update on the environmental management plan; and
- Fuel spill prevention.

A-31

The chapter should also present a discussion of the following topics:

- Future stormwater management improvements (if any); and
- Future MCP and tank management activities.

Sustainability at Logan Airport

This chapter describes Massport's airport-wide sustainability goals. In October 2000, the Massport Board approved an Authority-wide Environmental Management Policy that articulates Massport's commitment to protect the environment and to implement sustainable design principles. In October 2004, the Massport Sustainability Team produced the *Massachusetts Port Authority Sustainability Plan* (Sustainability Plan). The Environmental Management Policy is incorporated in the Sustainability Plan as Massport's long-term sustainability goal or vision. It also identifies the actions necessary to achieve the goals, the staff members responsible for each sustainability goal, and the timeline for achieving the goals.

The 2012-2013 EDR should report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review and other commitments and have commenced construction. The status of mitigation commitments made in the Section 61 Findings for the following projects should also be reported:

A-32

- West Garage/Central Garage
- International Gateway
- Runway Ends 22R and 33L Runway Safety Area Improvements
- Replacement Terminal A
- Logan Airside Improvements Planning
- Southwest Service Area Redevelopment Program

A-33 This chapter should also update the status of Massport's mitigation commitments and also will identify projects for which mitigation is complete.

Distribution of the 2012-2013 EDR

A-34 Massport should explore opportunities to advance the reporting of information through Massport's website. Massport should strive to collect and analyze the information required for

A-35 the 2012-2013 EDR and report this information in a timely manner. For several recent projects, including the 2011 ESPR, Massport has published bi-lingual meeting and project notices and

A-36 made the services of an interpreter available upon request. Massport should consider continuing these services for the 2012-2013 EDR submittal.

Conclusion

A-37 I have determined that the 2011 ESPR for Logan Airport has adequately complied with MEPA and that Massport must submit a 2012-2013 EDR that responds to the issues raised in comments received. The 2012-2013 EDR must include a copy of this Certificate and a copy of each comment letter received on the 2011 ESPR. In particular, Massport should provide a thorough examination of issues raised regarding individual noise monitoring locations, noise measurement and modeling, noise abatement, and air quality issues.

June 14, 2013
Date

Richard K. Sullivan Jr.

EEA #3247 2011 ESPR Certificate June 14, 2013

Comments Received:

06/06/2013	Philip Johenning
06/07/2013	Nancy Timmerman
06/07/2013	Stephen Kaiser, PhD
06/07/2013	Darryl Pomicter
06/07/2013	Town of Milton
06/14/2013	The Boston Harbor Association

RKS/ACC/acc

This Page Intentionally Left Blank.

Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Terminal E Modernization Project Environmental Notification Form

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1081
http://www.mass.gov/eea

December 16, 2015

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Terminal E Modernization
PROJECT MUNICIPALITY	: East Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15434
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: November 9, 2015

Pursuant to the Massachusetts Environmental Policy Act (M.G. L. c. 30, ss. 61-62I) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I have carefully reviewed the Environmental Notification Form (ENF), comments submitted on it, and have carefully considered whether an EIR is warranted. The project is undergoing MEPA review and requires an ENF pursuant to 301 CMR 11.03(6)(b)(6) because it will be undertaken by a State Agency and consists of the expansion of an existing terminal at Logan Airport by greater than 100,000 sf. The project does not exceed a Mandatory EIR threshold. Mandatory EIR thresholds are established to identify a category of projects, or aspects thereof, for which it is presumed that the environmental impacts warrant additional analysis in an EIR.

Comments identify concerns with the project and its impacts and identify broader concerns associated with airport operations and growth. These include comments from Senator Petruccelli, Representative Madaro, and Councilor LaMattina; Representative Garett J. Bradley; the City of Boston Environment Department; the Town of Hull; the Milton Board of Selectmen; representatives of the Massport Citizens Advisory Committee (CAC); and many residents. I have weighed these concerns against the presumption that the project is not subject to a Mandatory EIR and that Massport will prepare an Environmental Assessment (EA) for review pursuant to the National Environmental Policy Act (NEPA), which will include additional opportunities for public comment.

I have determined that additional information regarding the necessary details of design and development of the Terminal E expansion is warranted to properly assess potential impacts. The Scope for the EIR is narrowly tailored to the project and its specific impacts. It is intended to

augment the federal review process, not duplicate it. The EIR is not intended to address broad concerns associated with airport operations and growth. The venue for addressing cumulative environmental impacts is through the Environmental Status and Planning Reports (ESPR) and Environmental Data Reports (EDR).

Through these reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment. This regular updating and reporting on planning and cumulative impacts is unique among State Agencies. It reflects the challenge and complexity of managing and modernizing Logan Airport within a dense, urban area. It recognizes that the proximity of communities to the Airport warrants an enhanced level of public engagement and a concerted, long-term effort to minimize and mitigate impacts.

I expect that Massport can prepare a Draft EIR that will adequately address the Scope such that I may determine, pursuant to 301 CMR 11.08, that no substantive issues remain to be addressed and allow the DEIR to be reviewed as a Final EIR (FEIR) or as a Response to Comments on the DEIR.

Project Description

The project proposes modernizing Boston-Logan International Airport's John A. Volpe International Terminal (Terminal E) with a 500,000 to 700,000-square foot (sf) addition that corrects facility deficiencies and accommodates current and anticipated passenger volumes. The project includes three gates which previously underwent MEPA review (International Gateway Project, EEA #9791) but were not constructed, and two to four additional aircraft gates, passenger holdrooms, concourse, concessions, and passenger processing areas. The project includes Customs and Border Patrol (CBP) and Federal Inspection Services (FIS) facilities to replace and expand FIS facilities that were originally reviewed under MEPA (Terminal B, Pier A Improvements/Satellite FIS Facility, EEA #12235) but also not constructed. The project also includes a direct pedestrian connection between Terminal E and the Massachusetts Bay Transportation Authority's (MBTA) Blue Line Airport Station.

Terminal E was constructed in 1974 with 12 gates and served 1.4 million annual passengers. In 2014, it served approximately five million passengers. The ENF indicates that the current level of passenger activity routinely causes severe congestion in the terminal and negatively impacts customer service and operations. During peak late afternoon and early evening periods, passengers experience severe congestion and delays at the ticket counters and security screening areas, and there is insufficient seating, concessions, and other support services. The ENF indicates that aircraft must use remote parking facilities at hardstands in the North Cargo Area and passengers are bused to the terminal during peak periods when there are insufficient gates. Massport has clearly demonstrated the need for the project and made a compelling case for the expansion.

The project is proposed in two phases. The first phase could include up to five new gates; part of the concourse extension, including the majority of the additional terminal processing area; roadway and curb improvements; and direct pedestrian connections to the MBTA Blue Line Airport Station. The second phase would primarily consist of the remainder of the concourse area, additional gates, holdrooms, boarding bridges; support spaces such as concessions, mechanical spaces, airline and airport operations spaces; and passenger processing areas. Both

phases include airside modifications to accommodate aircraft maneuvering, taxiing, parking, and docking operational requirements.

The project will displace ground service equipment (GSE), other airside activities, existing surface parking, the cell phone lot, and the gas station which will be relocated within existing airport boundaries.

Environmental Status and Planning Report (ESPR)

The MEPA environmental review process for Logan Airport occurs on two levels: airport-wide and project-specific. The ESPR and EDR provide a "big picture" analysis of the environmental impacts of current and anticipated levels of airport-wide activities (including aircraft operations and passenger activity), and presents comprehensive strategies to avoid, minimize and mitigate impacts. The ESPR is generally updated on a five-year basis; the most recent ESPR for the year 2011 was filed in April 2013. Environmental Data Reports (EDRs) evaluate environmental conditions for the reporting year as compared to the previous year and are filed in the years between ESPRs. The most recent EDR for the year 2014 was filed in October 2015. The ESPR is supplemented by (and ultimately incorporates) the EDRs and the detailed analyses and mitigation commitments that emerge from project-specific reviews. This process provides a comprehensive and continuous review of airport programs, projects, environmental impacts and associated data.

The MEPA regulations (Section 11.06(2)) indicate that during the course of an ENF review I may review any relevant information from any other source to determine whether to require an EIR, and, if so, what to require in the Scope. To provide context for this project-specific review and because many issues raised by commenters relate to airport-wide operations and impacts, this Certificate refers to documents from the Environmental Status and Planning Report (ESPR) process (EEA#3247/5146). Massport indicates that the Terminal E project is consistent with the analysis presented in the Environmental Status and Planning Report (ESPR) and has incorporated that document by reference into the ENF as the framework for analyzing cumulative impacts of, and mitigation for, Logan Airport projects, and considers the regional transportation context.

The 2011 ESPR reported on key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking. In addition to the annual report on 2011 conditions, the ESPR evaluated the cumulative impacts of passenger growth and associated ground and aircraft operations looking forward to 2030. The ESPR also presented environmental management plans for addressing areas of environmental concern.

The 2011 ESPR identifies a future phase of the International Gateway Project – Terminal E, which includes three new gates, and assumes it is constructed by 2030. The 2012/2013 EDR also identifies this project and indicates it will be constructed beyond 2022. The 2014 EDR identifies the Terminal E Modernization Project as a stand-alone project. It indicates that it would include an additional two to four gates for a total of five to seven gates and construction could begin in 2018.

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities.

Terminal E is located adjacent to the North Cargo Area, closest to the MBTA Blue Line Airport Station. Land uses in the area of the proposed project include UPS aircraft parking and loading area, the airport's Remain Over Night aircraft parking area, the North Cargo Area equipment storage area, a building occupied by United Parcel Service (UPS), the MBTA Blue Line Airport Station, airport roadways, various short-term and cell phone parking lots, and a gas station.

The project site is located within the coastal zone of Massachusetts. The entirety of the project site is comprised of previously disturbed impervious area. It is not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The project site does not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

The ENF identified the following projects within the vicinity of Terminal E that have been reviewed under MEPA: Terminal A Replacement (EEA#9329), Terminal E Modifications (EEA#9324), Federal Inspection Services (FIS) Facility and West Concourse Project / International Gateway (EEA#9791), and Terminal B, Pier A Improvements/Satellite FIS Facility (EEA#12235).

Permitting and Jurisdiction

The project is undergoing MEPA review and requires an ENF pursuant to 301 CMR 11.03(6)(b)(6) because it will be undertaken by a State Agency and results in the expansion of an existing terminal at Logan Airport by greater than 100,000 sf.

The project requires a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC) and may require an Industrial User Permit from the Massachusetts Water Resource Authority (MWRA). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review.

The project requires approval by the Federal Aviation Administration (FAA) for changes to the Airport Layout Plan and, therefore, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the U.S. Environmental Protection Agency.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Environmental Impacts and Mitigation

The project includes construction of approximately 500,000 to 700,000 sf of new floor area (for a maximum 1,500,000 sf total), and will increase both water consumption and wastewater generation by approximately 25,600 gallons per day (76,800 gpd total). The project will not create new impervious area and will eliminate approximately 60 parking spaces. The ENF indicates that the project will accommodate existing and forecasted passenger levels and operations and, therefore, will not increase passenger enplanements or vehicle trips.

Measures to avoid, minimize and mitigate project impacts include improving high-occupancy vehicle (HOV) access to the airport via a direct pedestrian connection to the MBTA Blue Line Airport Station and reducing air emissions, greenhouse gas (GHG) emissions, and energy consumption by providing better access to gate plug-ins and pre-conditioned air. The ENF also indicates that the building will act as a noise barrier to the adjacent neighborhood and Memorial Stadium Park.

Review of the ENF

The ENF includes a general description of proposed activities, a conceptual plan, and a limited analysis of alternatives. It does not provide a typical level of information necessary to evaluate the potential environmental impacts of the project for the purpose of MEPA review. The ENF does not address why construction projections have changed compared to the ESPR and EDR or how the increase in gates may affect the impact analysis which is based on the 2011 ESPR forecasts. The ENF provides a scope for the NEPA EA that identifies further analysis and data that will be provided to assess potential impacts and measures to avoid, minimize, and mitigate these impacts. As requested by Massport, the ENF was subject to an extended 30-day comment period to provide additional time for public review and comment. C.1

Environmental Justice

Massport provided outreach consistent with the spirit and intent of the enhanced public participation provisions of the EJ Policy. Massport requested and was granted an extension of the comment period to provide additional time to review and comment on the ENF. The meeting notice was published in The Boston Herald, The East Boston Times, and the Winthrop Transcript. It was translated into Spanish and also published in El Mundo. Spanish language translation was provided at the joint MEPA/NEPA meeting held on November 19, 2015. In addition, Massport held additional meetings and presented information regarding the Terminal E Expansion at a number of meetings from September through December. I expect that Massport will employ similar approaches to ensure public review and comment of the EIR. C.2

Massport has also provided enhanced air quality analysis and assessment of cumulative impacts in the ESPR and EDRs that address the spirit and intent of the EJ Policy. The Scope for the EA indicates that it will evaluate potential disproportionate noise and air quality impacts for existing and future build years 2022 and 2030; demonstrate how it will avoid, minimize, and/or mitigate these impacts to the greatest feasible extent; and, ensure that its proposed actions will not unduly burden low income or minority areas. C.3

I have received numerous comment letters regarding environmental justice and concerns that the burden of cumulative noise, air pollution, and traffic impacts associated with growth and increased operations will be borne by neighboring communities, independent of this specific project. The Executive Office of Energy and Environmental Affairs (EEA) Environmental Justice Policy (EJ Policy) was designed to improve protection of low income and communities of color from environmental pollution as well as promote community involvement in planning and environmental decision-making to maintain and/or enhance the environmental quality of their neighborhoods.

Alternatives Analysis

The ENF identified a maximum developable footprint and indicated that all Build Alternatives will be located within previously developed land within the Airport Boundary. It did not identify a Preferred Alternative or compare relative impacts/benefits of alternatives. The ENF indicated that conceptual Build Alternatives will be developed during the NEPA permitting process based on airport industry planning standards, FAA, Customs and Border Patrol, and Transportation Security Administration (TSA) requirements that define various terminal, airside, and landside functions. The key differences among potential alternatives will relate to the internal and external layout of the building, the ability to efficiently accommodate passengers, and constructability. According to the ENF, all Build Alternatives will include phased development of three gates followed by the development of between two and four additional new gates, additional concourse with supporting facilities, a new direct pedestrian connection to the MBTA's Blue Line Airport Station, reconfiguration of adjacent roadways and short-term parking areas, and reconfiguration of some airside operations. All Build Alternatives will be located within existing paved and developed areas of the airport that are currently used for aviation or aviation-related activities. C.4

The ENF indicates that under the No-Build alternative, passenger and aircraft operations would continue to increase as projected in the 2011 ESPR, but there would be no significant changes to Terminal E interior or exterior facilities. Gate service facilities would be inadequate to efficiently handle the increase in scheduled operations and passengers and arriving aircraft would wait on the apron with engines idling until an aircraft clears a gate or park at a "hardstand" away from the Terminal at a North Cargo Area aircraft parking area and passengers will deplane using mobile stairs and be bused to the terminal. Hardstand operations, aircraft idling, and the use of on-board diesel auxiliary power units (APU) require greater use of energy, including bussing passengers to and from the terminal, and use of the aircraft engines to provide electricity to the cabin during these ground operations. The ENF indicates that the No-Build alternative would result in insufficient passenger processing capacity, long wait times at ticketing and security, and additional congestion at the curb and roadway. Based on these considerations, the No-Build alternative was eliminated.

Comments on the ENF request Massport accommodate more demand at regional airports and evaluate regional project alternatives to the proposed project. I acknowledge that long-term strategies to mitigate Logan's impacts will continue to include an emphasis on diverting travel to regional airports and to rail. Regional transportation will continue to be addressed through the ESPR and EDR, not through this project-specific review. C.5

The 2011 ESPR and 2014 EDR provide a thorough analysis of trends in regional airport activity and identify initiatives and joint efforts to improve the efficiency of the regional transportation system (including regional rail transportation initiatives). The reports identify Massport investments in Hanscom Field and Worcester Regional Airports, consistent with the findings of the 2006 New England Regional Airport System Plan (NERASP) Study. Future ESPRs and EDRs will require Massport to report on Logan's role in the regional transportation system; Massport's efforts to promote the Worcester Regional Airport and Hanscom Field; the status of plans and improvements provided by the regional airport authorities; cooperation with other transportation agencies to promote efficient regional highway and transit operations; and, report on metropolitan and regional rail initiatives and ridership. The reports demonstrate that Massport has continued to emphasize and build on opportunities to strengthen regional transportation.

Climate Change Adaptation and Resiliency Measures

Massport recently completed a Disaster and Infrastructure Resiliency Planning (DIRP) Study and generated a Floodproofing Design Guide which are intended to improve their ability to restore operational capabilities during and after major disruptions, and to adapt and enhance facilities to be more resilient to the effects of extreme weather events. The DIRP Study identified increased storm and sea-level rise as the threats with the highest probability of occurring and impacting Massport operations. The Floodproofing Design Guide also notes that Logan Airport is increasingly susceptible to flooding hazards caused by extreme storms and rising sea levels as a result of climate change.

The ENF does not include information regarding current Federal Emergency Management Agency (FEMA) floodplain mapping. MassDEP comments note that preliminary flood mapping[1] depicts the 100-year flood zone to the west of the project site, near the Airport MBTA Station. Comments from MassDEP and CZM indicate the proximity of the project to the coastal environment may make it susceptible to sea level rise and increased storm intensity and frequency-related impacts. Massport should draw on the DIRP Study and Floodproofing Design Guide to develop mitigation strategies to support the functionality and resiliency of Terminal E in the near and distant future. I encourage Massport to consult with CZM as the project design process progresses. C.6

Greenhouse Gas Emissions

Because I am requiring an EIR, the project is subject to review under the May 2010 MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol ("the Policy"). The ENF indicates that Massport will quantify stationary and mobile source GHG emissions generated by the project and will identify measures to avoid, minimize, or mitigate GHG emissions to determine the applicability of state and federal requirements. I note that mobile sources will only include passenger vehicles and GSE. The ENF indicates that the energy demand of the project may require a new substation and that energy modeling will be used to quantify the GHG emissions for the terminal building. C.7 C.8 C.9

[1] Preliminary Flood Insurance Rate Map, Map Number 25025C0082J, March 16, 2016

Massport has incorporated sustainability into all aspects of its activities through a Sustainability Management Plan as described in the 2014 EDR. Recent Massport accomplishments include compliance with the Leading by Example Executive Order which requires state agencies to procure 15 percent of their electricity from renewable resources; the new Rental Car Center in the Southwest Service Area receiving Logan's first LEED Gold Certification in 2015; and expansion of the Logan Express Bus Service and ongoing support of HOV measures.

Noise

The ENF asserts that the project will not increase the number of aircraft operations when compared to the Future No-Build Alternative. The ENF also indicates that the proposed terminal building will act as a sound barrier to dampen or reflect noise because it will be positioned between the airfield and roadway. These benefits were not analyzed in the ENF. The ENF indicates that the EA will assess the potential for anticipated ground noise impacts resulting from proposed changes to the functioning of the North Cargo Area. The EA will also contain an analysis of the specific sound barrier benefits of the proposed terminal.

Impacts associated with existing operations and noise levels, and potential increases in impacts associated with this project and long-term growth, are a major concern identified in most comment letters. Letters identify a particular concern with nighttime noise and concentrations of flight tracks and increased flight frequency due to the FAA's area navigation (RNAV) procedures. As documented in the ESPR and annual EDR submittals, implementation of several of the RNAV procedures have generated increased noise complaints in some towns surrounding Logan Airport. The procedures themselves have resulted in aircraft at higher altitudes, though in patterns that are concentrated over certain communities. Since 2000, the number of daily aircraft operations and the number of people exposed to the 65 decibel (dB) Day-Night Average Sound Level (DNL) has declined by approximately 27 percent and fifty percent (respectively); reflecting a trend towards fewer overall flights with larger, more efficient, and quieter aircraft. I acknowledge that projected increases in flight operations will increase cumulative noise impacts compared to existing conditions, although they will remain below historic levels. Cumulative impacts will continue to be addressed through the ESPR and EDR, not through project specific review of the Terminal E project. C.10

Air Quality

The ENF indicates that the project will not alter runway use and will not affect the number of anticipated aircraft operations or generate any new vehicle trips. The project may alter airside ground operations in the North Cargo Area, including aircraft taxiing and parking, use of hardstands and busing, and use of supporting ground service equipment (GSE). The ENF indicates that an emissions inventory for the EPA criteria pollutants for airside ground operations (not flight operations) will be conducted for existing and future-year conditions using the recently released FAA Aviation Environmental Design Tool (AEDT). The AEDT will evaluate changes in aircraft ground operations and associated GSE and airside motor vehicle emissions will be assessed using the EPA MOVES model.

Total air quality emissions from all sources at Logan Airport in recent years are significantly less than they were a decade ago. The ENF attributes this downward trend to

Massport's longstanding objective to accommodate the demands of increasing passenger and cargo activity levels with fewer aircraft operations generating fewer emissions. The 2014 EDR demonstrated that total emissions are incrementally increasing. Massport will continue to assess the applicability of emissions reduction measures to the extent practicable and report on air quality in the ESPR and the EDR. C.11

Many comments cite the findings or request additional information on the 2004 Logan Airport Health Study performed by the Massachusetts Department of Public Health (DPH)[2]. The study was published in May 2014 and identified two respiratory outcomes for adults and children living in the high exposure area. In addition to contributions from Logan Airport, the study identified high background levels of air pollutants. The results of this study and have been reported in the annual EDR filings and include actions Massport is taking based on recommendations of the study. Cumulative air quality impacts will continue to be addressed through the ESPR and EDR, not through project specific review of the Terminal E project. C.12

The 2014 EDR indicates that Massport is working with DPH and the East Boston Health Center on implementing the DPH recommendations, including:

- Massport is providing funding to the East Boston Neighborhood Health Center to help expand the efforts of its asthma and chronic obstructive pulmonary disease (COPD) prevention and treatment program in East Boston and launch a program in Winthrop for screening children, providing asthma kits, and home visits;
- Massport entered into an agreement with the Massachusetts League of Community Health Centers for the evaluation and assessment of the Asthma and COPD Prevention and Treatment Program, and engagement of community health centers in the North End, Charlestown, Chelsea, and South Boston. The East Boston Neighborhood Health Center will conduct the same evaluations for the East Boston and Winthrop Community Program.
- Massport entered into an agreement with DPH to expand or establish the Asthma and COPD Prevention and Treatment Program in South Boston, the North End, Chelsea, and Charlestown in collaboration with the Massachusetts General Hospital and the South Boston Neighborhood Health Center, and to conduct training on the Community Health Worker assessments.

Transportation

The ENF asserts that the project will not increase passenger enplanements or vehicle trips to the airport, and therefore, the transportation analysis will be limited to the airport transportation network. The project will require relocation of existing uses in the project area to other airport locations. The ENF indicates that the EA will describe the existing transportation network at the airport, anticipated modifications to the transportation network, and anticipated transportation impacts of the project. According to the ENF, the EA will evaluate potential transportation impacts that may result from the relocated uses. The analysis will evaluate traffic impacts of the preferred alternative and a No-Build Alternative. The analysis will be conducted

[2] The study is available for download at http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/investigations/logan-airport-health-study.html

using the Logan Airport VISSIM model for existing and proposed conditions, with supporting traffic analyses performed using other software (Synchro and QATAR). The analysis will use the VISSIM model results from 2014 (as reported in the 2014 EDR) as the baseline year and the build conditions will be evaluated for 2022 and 2030.

The project includes construction of a direct pedestrian connection between Terminal E and the MBTA Blue Line Airport Station. The EA will include an analysis of the existing public transportation options serving the airport and evaluate the potential impacts the direct connection may have on ridership and operations. C.13

Many comments urge that I require a detailed analysis of ground transportation issues due to the cumulative impacts of landside and air operations at Logan and the identified issues with limited parking capacity. The issues of ground transportation and parking are clearly relevant to any discussion of cumulative impacts, and are an important component of any cumulative air quality analysis, which will continue to be addressed through the ESPR and EDR, not through this project specific review of the Terminal E Expansion. C.14

The ESPR and annual EDR updates include a substantial body of analysis on ground transportation issues. The 2014 EDR indicates that Massport is developing a Long-Term Parking Management Plan intended to address the parking supply, pricing and operations associated with Logan's constrained parking. Strategies to address the parking issue may have implications for design of the Terminal E Modernization project, including curbside access and/or short-term parking areas. C.15

Wastewater & Water Supply

According to the ENF, the project will generate an additional 25,600 gallons per day (gpd) of wastewater flow, for a total of 76,900 gpd. Similarly, the project will consume an additional 25,600 gpd of potable water, for a total of 76,800 gpd. MassDEP has indicated that the project will not require a Sewer Connection Permit from MassDEP. However, under the terms of the new Sewer System Extension and Connection Regulations (314 CMR 12.00), MassDEP requires that sewer authorities with permitted combined sewer overflows (CSOs), including the Boston Water and Sewer Commission (BWSC), require the removal of four gallons of infiltration and inflow (I/I) for each gallon of new wastewater flows generated by any new connection that would generate greater than 15,000 gpd. I refer Massport to comments from BWSC that provide additional guidance on this issue and identify applicable design standards for all new or relocated water mains and sewers. C.16

Comments from MWRA indicate that the project site is served by BWSC combined sewers that discharge to the MWRA's East Boston Branch Sewer. The ENF indicates that there is sufficient capacity in the existing collection system to accommodate the additional flow. I refer Massport to comments from MWRA which request the analysis also consider wet weather flow conditions. C.17

Stormwater

The ENF indicates that the project will not create new impervious area as development of the terminal will occur in an area that is already paved. The Terminal E complex will continue to drain to the North Outfall, which is equipped with end-of-pipe treatment to remove debris and floating oils and grease from stormwater prior to discharge. Comments from CZM indicate that samples from the North Outfall recently exceeded water quality standards for bacteria and recommend that Massport develop a strategy to identify and eliminate illicit sewer connections to address this issue. C.18

According to the ENF, the EA will include a drainage analysis and description of the proposed stormwater management measures and identify the size and location of stormwater management features. The EA will also demonstrate how the project will meet MassDEP Stormwater Management Standards, Logan Airport's stormwater management practices, and the requirements of the NPDES Multi-Sector General Permit under which the airport operates. I refer Massport to comments from BWSC that identify applicable design standards and plan requirements, and provide guidance on discharge of dewatering drainage. C.19

Historic and Archaeological Resources

According to the ENF, the project site does not contain any properties listed in the State or National Registers of Historic Places. The project site contains both an area and a structure that are included in the Massachusetts Historical Commission's (MHC) Inventory of Historic and Archaeological Assets of the Commonwealth (the Inventory). Specifically, the entirety of Logan Airport is identified as an Inventoried Area (MHC ID#BOS.K) and Terminal E is identified as an Inventoried Structure (MHC ID#BOS.63). The ENF contains a commitment to coordinate with MHC to identify potential impacts and avoidance, minimization, and mitigation measures.

Construction Period

The ENF does not identify specific construction period impacts or associated mitigation measures. It indicates that construction period impacts, including noise, air quality, traffic, solid and hazardous waste, and water quality will be evaluated in the EA. It will also describe project phasing and sequencing. Massport participates in MassDEP's Clean Construction Equipment Initiative and requires engine retrofits to reduce exposure to diesel exhaust fumes and particulate emissions. The ENF indicates that demolition activities will comply with MassDEP's Solid Waste and Air Quality control regulations. I refer Massport to comments from MassDEP that provide guidance on asbestos removal and the handling of asphalt, brick, and concrete. The ENF indicates Massport will recycle construction & demolition (C&D) waste. C.20

The ENF indicates that contaminated material will be managed in compliance with the Massachusetts Contingency Plan (MCP) and that a Soil Management Plan may be required to determine whether excavated soils generated through foundation construction can be used onsite or hauled off-site for reuse and/or disposal. The ENF indicates that areas near the site have been regulated under c.21E Release Tracking Number (RTN) 3-10027 (Phase V) and RTN 3-324. MassDEP comments note RTN 3-324 appears to be linked to a site in a different city. Massport should review and confirm the RTN or provide the correct RTN for the site. I refer Massport to MassDEP comments, which provide additional guidance on the excavation, removal and/or C.21 C.22

disposal of contaminated soil, pumping of contaminated groundwater, and/or working on contaminated media. C.22 Cont.

Conclusion

The ENF has provided an overview of the Terminal E Expansion, identified potential environmental impacts, and identified opportunities to avoid, minimize and mitigate impacts; however, the ENF did not provide sufficient information to demonstrate that Massport has sufficiently analyzed alternatives and measures to avoid, minimize and mitigate potential impacts of this specific proposal to the maximum extent practicable.

As noted previously, numerous comments raise concerns about the project, the management of growth at Logan Airport, the environmental and community impacts of this growth, and the mitigation of impacts. I have also received comments that suggest review of the Terminal E Modernization project has been improperly segmented under MEPA from the review of airport operations as a whole.

Massport asserts that international passenger activity is forecast to increase independent of any additional facilities. The 2011 ESPR provides accurate forecasts of passenger demand and aviation activity in 2030 and documents that demand for passenger service is primarily determined by external factors, including economic growth, cost of travel, and demographic shifts. In addition, I note that Massport has been engaged in planning to accommodate growth in international passengers and operations since the 1990's.

The issue of cumulative airport-wide impacts and segmentation is not new to the review of projects at Logan Airport. The ESPR and EDR provide a cumulative analysis of Logan Airport operations, environmental impacts, and mitigation measures. Review of individual projects proceeds within the context of this long-term planning and analysis of cumulative impacts. The record of MEPA review clearly demonstrates that Massport has and continues to identify impacts associated with individual projects within the context of long-term plans and cumulative impacts of Logan Airport. Cumulative impacts and project specific impacts will continue to be assessed on separate tracks; they will complement each other and ensure that projects are not viewed in isolation. C.23

Based on a review of the ENF, consultation with State Agencies and review of comment letters, I am requiring that Massport submit an EIR consisting of the EA and limited additional information identified in the Scope. The DEIR will consist of a project specific review of the Terminal E Modernization project within the context of airport-wide operations and impacts as a whole. The purpose of the DEIR is to:

1. Provide a detailed and comprehensive project description including conceptual design; C.24
2. Identify protect-specific impacts and the project's consistency with Logan planning and annual reporting; C.25
3. Consider how alternative building design and location, within the project site, can minimize impacts and maximize benefits; and, C.26
4. Provide draft Section 61 Findings that identify project-specific mitigation measures. C.27

Through this review, Massport will demonstrate that it has met its obligations under MEPA to avoid, minimize and mitigate impacts of the Terminal E Modernization to the maximum extent feasible.

In recognition of the comment letters that raise concerns with cumulative airport-wide impacts pertaining to traffic and parking, air quality, and noise and, consistent with the MEPA review structure for Logan Airport, I am requiring Massport to respond to comments regarding airport operations and cumulative impacts in subsequent ESPR and/or EDR documents. The next ESPR will analyze calendar year 2016 and will likely be filed in late 2017 or 2018 and the next EDR will analyze calendar year 2015 and will likely be filed in the fall of 2016. C.28

The 2015 EDR Scope includes reporting on noise, air quality, and long-term parking management. C.29 The 2016 ESPR should revise growth projections based on the changes in the Terminal E Modernization Project that occurred subsequent to the 2011 ESPR (if necessary). C.30 It should also should reflect the proposed connection to the Airport Station and identify the anticipated ridership, changes in the HOV mode share, and ground access planning considerations. C.31

SCOPE

General

The ENF included a proposed scope for the Environmental Assessment that will undergo review pursuant to the National Environmental Policy Act (NEPA). It includes a project description and permitting, alternatives, air quality, climate, coastal resources, hazardous materials, solid waste, pollution prevention, historical, architectural, archaeological and cultural resources, land use, natural resources and energy supply, noise and compatible land use, transportation, water resources, and construction impacts. In the interest of harmonizing State and federal review and in recognition of the significant and on-going planning and analysis represented by the ESPR and the EDRs, Massport may submit the EA as the Draft EIR. The EA should be supplemented by addressing the additions and modifications identified in this Scope. If Massport would prefer to tailor the EIR rather than submit the EA, the EIR should consist of the standard MEPA requirements for an EIR (Section 11.07(6)) and address the requirements of the MEPA GHG Emissions Policy and Protocol. C.32

Massport may also choose to coordinate the State and federal review. MEPA comment and review periods may be adjusted to align with NEPA deadlines. Lastly, I note that this certificate applies to the review of the project under MEPA only, and does not restrict the ability of the federal government to act on those aspects of the project subject to NEPA.

Project Description and Permitting

The EIR should identify and describe any changes to the project since the filing of the ENF and provide an update on State, local, and federal permitting. It should include a discussion of permitting requirements and document the project's consistency with regulatory standards. C.33

The EIR should include updated site plans for existing and post-development conditions at a legible scale including curbside improvements and changes to the on-airport roadways. C.34

The EIR should provide an update on consultations with the MBTA regarding the proposed connection to the MBTA Airport Station. The EIR should identify whether a Land Transfer (including easement) from MBTA will be required to construct the pedestrian connection to the MBTA Airport Station. The EIR should include a conceptual design for the proposed connection to the Airport Station and identify anticipated ridership, potential changes in the HOV mode share, and associated ground access planning considerations. C.35

Alternatives Analysis

The EIR should identify the planning metrics, facility requirements, and assumptions used to design the project and to determine the final number and location of gates. C.36 It should compare and contrast benefits and potential impacts of alternatives in narrative form and it a tabular format. The EIR should identify the peak hour used to determine gate locations and design passenger hold rooms. The EIR should identify the number of planes that are currently forced to "hard stand" during peak hours due to lack of available gates to the number of planes. C.37 It should identify the number forced to "hard stand" during peak hours under proposed alternatives. The EIR should include a discussion of the proposed project and alternatives consistency with the long-term growth forecasts contained in the ESPR and EDR. C.38

GHG Emissions and Climate Change Adaptation and Resiliency

The project is in the conceptual design state and, as such, provides meaningful opportunities for reduction GHG emissions associated with the building location, orientation and design as well as incorporation of resiliency and adaptation considerations. The EIR should describe the project's consistency with the DIRP Study and Massport's Floodproofing Design Guide to demonstrate that the project will incorporate proactive site design measures to address potential impacts related to predicted sea level rise. C.39 In addition to Massport assets, I encourage Massport to consult with the MBTA to review existing station vulnerabilities, as operations of the Blue Line and this station are important to support Massport HOV goals. C.40

The EIR should include an analysis of GHG emissions and mitigation measures in accordance with the standard requirements of the MEPA GHG Policy and Protocol. The analysis should include project-related stationary source emissions and mobile source emissions (passenger vehicles and GSE). I refer Massport to comments from DOER and MassDEP which provide additional guidance regarding mitigation measures that should be explored as part of the GHG analysis. C.41 DOER identifies combined heat and power (CHP) as a particularly promising and effective energy efficiency measure that could also support resiliency of the facility. The EIR should include a feasibility analysis of CHP and a roof-mounted solar photovoltaic (PV) system. I encourage Massport to meet with representatives from MEPA and DOER prior to preparation of the GHG analysis. C.42

Noise

The EA will include a noise analysis. The EIR should identify how the sound barrier benefits of the terminal have been maximized through its location and design. The EIR should C.43

identify whether the addition of new gates constructed to current industry standards would affect the fleet mix and, potentially, alter/increase noise and vibration on Logan Airport and within the surrounding community compared to the 2030 forecasts. C.43 Cont.

Air Quality

The EA will include an emissions inventory for the EPA criteria pollutants for airside ground operations for existing and future-year conditions to evaluate changes in aircraft ground operations and associated GSE and airside motor vehicle emissions. The EIR should quantify the impacts or benefits of providing direct access to plug-in gate operations and decreasing reliance on auxiliary power units, ground support equipment, and busing passengers around the airport. Massport should consider the potential and relative benefits of alternative building locations on the site and design between the airfield and neighborhoods as it relates to creating a potential barrier to particulate matter and other hazardous air pollutants. C.44 C.45 C.46

Construction Period

The EA IR should identify construction period impacts, including noise, air quality, traffic, solid and hazardous waste, and water quality and identify avoidance, minimization, and mitigation measures. It should also describe project phasing and sequencing. C.47 C.48

Mitigation/Draft Section 61 Findings

The EIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include draft Section 61 Findings for each area of impact associated with Massport's Preferred Alternative. The EIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation (either funding design and construction or performing actual construction), and a schedule for implementation. To ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed by the Proponent, I require Proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings included in the EIR. C.49 C.50

Responses to Comments

The EIR should contain a copy of this Certificate and a copy of each comment letter received on the ENF. Based on the large volume of comment letters received, the comment letters may be provided electronically on a CD. In order to ensure that the issues raised by commenters are addressed, the EIR should include direct responses to these comments to the extent that they are within MEPA jurisdiction. This directive is not intended, and shall not be construed, to enlarge the scope of the EIR beyond what has been expressly identified in this Certificate. The response can refer to future EDRs and/or ESPRs to address issues that are not within the DEIR Scope. In addition to items noted in the Scope, the response to comments section should address comments from MassDEP pertaining to wastewater, recycling, source reduction and water conservation efforts. The EIR should also address wet weather capacity, C.51 C.52 C.53

wastewater flows, and I/I removal requirements as outlined in MWRA and BWSC's comments. I recommend that Massport employ an indexed response to comments format, supplemented as appropriate with direct narrative response. C.53 Cont. C.54

Circulation

In accordance with Section 11.16 of the MEPA Regulations and as modified by this Certificate, Massport should circulate a hard copy of the EIR to each State and City Agency from which the Proponent will seek permits. Massport must circulate a copy of the EIR to all other parties that submitted individual written comments. Per 301 CMR 11.16(5), the Proponent may circulate copies of the EIR to these other parties in CD-ROM format or by directing commenters to a project website address. However, Massport should make available a reasonable number of hard copies to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. Massport should send correspondence accompanying the CD-ROM or website address indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. A CD-ROM copy of the filing should also be provided to the MEPA Office. A copy of the EIR should be made available for review at the following Libraries: Boston Public Library – Main, Connolly, Orient Heights, Charlestown, and East Boson Branches, Chelsea Public Library, Winthrop Public Library, Revere Public Library, Everett Public Library, Milton Public Library, and Hull Public Library. C.55

December 16, 2015
Date

Matthew A. Beaton

Comments received:

12/07/2015	Massachusetts Department of Environmental Protection – Northeast Regional Office (MassDEP)
12/07/2015	Massachusetts Water Resources Authority (MWRA)
12/07/2015	Madeleine Steczynski
12/07/2015	Jane O'Reilly
12/07/2015	Alexis Daniels
12/07/2015	Chris Marchi (1st letter)
12/07/2015	Jason Burrell
12/07/2015	John Casamassima
12/07/2015	Kannan Thiruvengadam
12/07/2015	Robin Maguire
12/07/2015	Susanna Starrett
12/07/2015	Theresa Turino
12/08/2015	Alfred Pucillo
12/08/2015	Duane Eric Lock
12/08/2015	Jeannie Grieci
12/08/2015	Joanne Donatelli
12/08/2015	Joanne T. Pomodoro

12/08/2015	John Antonellis
12/08/2015	Lisa Rusch
12/08/2015	Lorraine Curry
12/08/2015	Magdalena Ayed
12/08/2015	Mary Elizabeth Nofziger
12/08/2015	Nancy Lagro
12/08/2015	Normairiis Casiano
12/08/2015	Rebecca Lock
12/08/2015	Sandra Downey
12/08/2015	Danielle Dell'Olio
12/08/2015	Allyson and Michael Simons
12/08/2015	Patricia J D'Amore
12/08/2015	Jessica L. Curtis
12/08/2015	Daniel Cano on behalf of the Eagle Hill Civic Association and Jeffries Point Neighborhood Association (dated 12/02/15)
12/08/2015	Dan Bailey
12/08/2015	Matthew Neave
12/08/2015	Salvador Cartagena
12/08/2015	Alexis Pumphrey
12/08/2015	Jeff Lee
12/08/2015	Kelly Rusch
12/08/2015	Christine Passarriello
12/08/2015	Rick Lockney (with attached data)
12/08/2015	Camille MacLean
12/09/2015	Angela Mroz
12/09/2015	Pamela Loring
12/09/2015	Brian Gannon
12/09/2015	Jay Benson
12/09/2015	Peter Chipman
12/09/2015	Kathyrn Leeber
12/09/2015	Carol Taylor
12/09/2015	Rebecca Lynds
12/09/2015	Georges Arnaout
12/09/2015	Lisa Locke
12/09/2015	James Linthwaite
12/09/2015	Mary J. Ryan
12/09/2015	Steve and Chrissy Holt
12/09/2015	Paul Paquin
12/09/2015	Karis L. North
12/09/2015	David and Carissa Juengst
12/09/2015	Caroline Sulick
12/09/2015	Maria Graceffa
12/09/2015	Robyn Riddle
12/09/2015	Elda and Mark Prudden
12/09/2015	Christine Thompson
12/09/2015	Frank J. Ciano, Arlington Logan CAC and Massport CAC Representative
12/09/2015	Senator Petruccelli, Representative Madaro, Councilor LaMattina
12/09/2015	Elke O'Brien

12/09/2015	Jeff Kerr (1st letter)
12/09/2015	Christina Leshock
12/09/2015	Collin Cameron
12/09/2015	Aaron M. Toffler, on behalf of Airport Impact Relief, Incorporated (AIR, Inc.)
12/09/2015	Jason Hibbard
12/09/2015	Gisela Voss and Dan Kernan
12/09/2015	Elizabeth Kay
12/09/2015	Harvey Rowe
12/09/2015	Jill Romano, Wenham Logan CAC Representative
12/09/2015	Leanne Tirabassi
12/09/2015	Myron Kassaraba, Belmont Logan CAC and Massport CAC Representative
12/09/2015	Nancy Plotkin
12/09/2015	Larry A. Butler
12/09/2015	Rowan Curran
12/09/2015	Lois Freedman
12/09/2015	Kathleen Conlon, Milton Board of Selectmen
12/09/2015	Frank Kerr, Hull Neighbors for Quiet Skies
12/09/2015	Jim Roberts
12/09/2015	Tom Hardey
12/09/2015	Donna Goes
12/09/2015	Colleen MacDonald
12/09/2015	Brian Carney
12/09/2015	Billy Avalos
12/09/2015	John Walkey
12/09/2015	Stephan Marin
12/09/2015	Amelia Cardona
12/09/2015	Jeff Karr (2nd Letter)
12/09/2015	Priscilla Beadle
12/09/2015	H. Gerald Zeller
12/09/2015	Arnie Freedman
12/09/2015	Bonita K Koelker
12/09/2015	Mary Ellen Welch
12/09/2015	Marie & James Fraher
12/09/2015	Erica Mattison, Environmental League of MA, Massport CAC Representative
12/09/2015	Lynn Marie Ray
12/09/2015	Dennis Saide
12/09/2015	Vera Schneider
12/09/2015	Neill K. Ray
12/09/2015	Boston Harbor Association
12/09/2015	Nicole Al Rashid
12/09/2015	Ellen M. Tan, Commonwealth Land Trust
12/09/2015	Cindy L. Christiansen, Milton Logan CAC Representative
12/09/2015	Patricia Waddleton
12/09/2015	Evie Rose
12/09/2015	Carey Lam
12/09/2015	Kathy Beitler
12/09/2015	Joe Berkeley
12/09/2015	Eileen M. Boylen

12/09/2015	David Flynn
12/09/2015	Michael Passariello
12/09/2015	Richard Armenia
12/09/2015	James B. Lampke, Town of Hull, Acting Town Manager
12/09/2015	Cindy Borges-Peralta
12/09/2015	Stephen Cooper
12/09/2015	Tina St. Gelais Kelly
12/09/2015	Tara Ten Eyck
12/09/2015	Maria Ticona
12/09/2015	Ira Fleishman
12/09/2015	Andrew Schmidt
12/09/2015	Debbie Ellerin
12/10/2015	Jeeyoon Kim
12/10/2015	Boston Water and Sewer Commission (BWSC)
12/10/2015	George and Diane Nassopoulos
12/10/2015	Betsy Lewenberg
12/10/2015	Representative Garett J. Bradley
12/11/2015	Massachusetts Office of Coastal Zone Management (CZM)
12/11/2015	Chris Marchi, (2nd letter)
12/11/2015	City of Boston – Environmental Department
12/11/2015	Mary Beth Hamwey
12/11/2015	Maureen White
12/11/2015	Jesse Purvis
12/11/2015	John Tyler
12/11/2015	Renee MacLean
12/11/2015	Edward MacLean
12/11/2015	E.F. (45 Grovers Ave.)
12/11/2015	D.P. (402 Meridian St.)
12/11/2015	Daniel Cordon
12/11/2015	Tanya Hahnel
12/11/2015	B.R. (412 Summer St.)
12/11/2015	A.V. (198 Everett St.)
12/11/2015	Gillian B. Anderson
12/12/2015	Elizabeth Stoy
12/15/2015	Department of Energy Resources (DOER)

MAB/PRC/prc

This Page Intentionally Left Blank.

Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Terminal E Modernization Project Draft Environmental Assessment/Environmental Impact Report

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1081
http://www.mass.gov/eea

September 16, 2016

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Terminal E Modernization
PROJECT MUNICIPALITY	: East Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15434
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: July 20, 2016

As Secretary of Energy and Environmental Affairs, I hereby determine that the Draft Environmental Impact Report (DEIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA; M.G.L. c.30, ss.61-62I) and with its implementing regulations (301 CMR 11.00). Consistent with Section 11.08 (8)(b)(2)(b) of the MEPA regulations, I am requiring the Proponent to file responses to comments on the DEIR and draft Section 61 Findings. The responses to comments and draft Section 61 Findings shall be filed, circulated, and reviewed as a Final Environmental Impact Report (FEIR). C.1

Comments on the DEIR reflect myriad concerns regarding existing airport operations and noise levels and potential increases in impacts associated with long-term growth. I have received comment letters from elected officials, including U.S. Congressman Michael E. Capuano, State Senator Joseph Boncore, State Representative Adrian Madaro, Boston City Councilor Salvatore LaMattina, and Chelsea City Councilor Roy Avellaneda. Comments were also submitted by municipalities, State and regional agencies, environmental advocacy groups, businesses and residents. The issue of cumulative airport-wide impacts, particularly noise and air quality, is not new to the review of projects at Logan Airport. As noted in past Certificates, the EIR is not intended to address broad concerns associated with airport operations and growth. The venue for addressing cumulative environmental impacts is through the Environmental Status and Planning Reports (ESPR) and Environmental Data Reports (EDR). Through these reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment on the cumulative impacts. This regular updating and reporting on planning and cumulative impacts is unique among State Agencies. It reflects the challenge and complexity of

managing and modernizing Logan Airport within a dense, urban area. It recognizes that the proximity of communities to the Airport warrants an enhanced level of public engagement and a concerted, long-term effort to minimize and mitigate impacts.

Subsequent ESPRs and EDRs will update the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts and update and revise environmental management plans to address impacts. Future submittals will continue to document potential impacts and trends and propose measures to implement the broad goal of maintaining or reducing Logan's overall environmental impacts, even as annual passenger volumes rise in the future. The next ESPR will analyze calendar year 2016 and will likely be filed in 2017 or 2018 and the next EDR will analyze calendar year 2015 and will likely be filed in the fall of 2016. C.2 C.3

Over the past year, Massport has engaged in a concerted outreach effort with elected officials, municipalities and community groups to identify and discuss potential Massport projects, including but not limited to, Terminal E. Massport created the Logan Airport Impact Advisory Group (IAG) to solicit comment and to identify and prioritize projects and programs of significance to the IAG. One project prioritized through this process is the construction of a pedestrian connection between the Massachusetts Bay Transportation Authority (MBTA) Blue Line Airport Station to Terminal E. Massport has incorporated this connection into the Terminal E project. I commend Massport for its outreach efforts which have been beneficial to informing the MEPA process. I encourage Massport to continue a productive dialogue with interested stakeholders, including through the IAG. C.4

Project Description

The project proposes modernizing Boston-Logan International Airport's John A. Volpe International Terminal (Terminal E) with a 560,000-square foot (sf) addition that corrects facility deficiencies and accommodates current and anticipated passenger volumes. The project includes three gates which previously underwent MEPA review (International Gateway Project, EEA #9791) but were not constructed, and four additional aircraft gates, passenger holdrooms, concourse, concessions, and passenger processing areas. The project includes Customs and Border Patrol (CBP) and Federal Inspection Services (FIS) facilities to replace and expand FIS facilities that were originally reviewed under MEPA (Terminal B, Pier A Improvements/Satellite FIS Facility, EEA #12235) but also not constructed. The project includes a direct pedestrian connection between Terminal E and the MBTA Blue Line Airport Station.

Terminal E was constructed in 1974 with 12 gates and served 1.4 million annual passengers. In 2014, it served approximately five million passengers. The DEIR indicates that the current level of passenger activity routinely causes severe congestion in the terminal at peak times, leading to greatly reduced customer service, and inefficient operations in the terminal and gates. According to the DEIR, gate congestion leads to airside delays and inefficiencies on the North Apron. When no gates are available, arriving aircraft and passengers are held on the apron. The DEIR indicates that aircraft must use remote parking facilities at hardstands in the North Cargo Area and passengers are bused to the terminal during peak periods when there are insufficient gates. The DEIR builds upon the information presented in the ENF regarding challenges associated with current operations at Terminal E. Massport has clearly demonstrated the need for the project and made a compelling case for the expansion.

The DEIR provided additional information to clarify and revise project phasing. The project is proposed in two phases. Phase 1 will be constructed from 2018 – 2022 and will include construction of four new gates with associated passenger holdrooms and elevators/escalators to relieve existing deficiencies and accommodate interim growth. A partial new concourse will be constructed to allow for future expansion to a seven-gate facility at full build-out. Phase 1 will not require modifications to roadway realignment. Phase 2 will be built by 2028 and will provide three additional gates and the MBTA connection. The DEIR indicates the project will be fully constructed and operational by 2030. Due to planning and budget constraints, the MBTA pedestrian connection has been shifted from Phase 1 as proposed in the ENF to Phase 2. The DEIR indicates that no other significant changes have occurred since the ENF was filed.

The project will displace ground service equipment (GSE), other airside activities, existing surface parking, the cell phone lot, and the gas station which will be relocated within existing airport boundaries. Relocation of ground facilities that conflict with the new concourse location, including the gas station, will occur in Phase 1.

Environmental Status and Planning Report (ESPR) and Environmental Data Reports (EDRs)

The MEPA environmental review process for Logan Airport occurs on two levels: airport-wide and project-specific. The ESPR and EDR provide a "big picture" analysis of the environmental impacts of current and anticipated levels of airport-wide activities (including aircraft operations and passenger activity), and presents comprehensive strategies to avoid, minimize and mitigate impacts. The ESPR is generally updated on a five-year basis; the most recent ESPR for the year 2011 was filed in April 2013 and it contained updated passenger activity levels and aircraft operations forecasts through 2030. EDRs evaluate environmental conditions for the reporting year as compared to the previous year and are filed in the years between ESPRs. The most recent EDR for the year 2014 was filed in October 2015. The EDR provided a comprehensive cumulative analysis of the effects of all Logan Airport activities based on actual passenger activity and aircraft operation levels in 2014 and presents environmental management plans for addressing environmental impacts. The ESPR is supplemented by (and ultimately incorporates) the EDRs and the detailed analyses and mitigation commitments that emerge from project-specific reviews. This process provides a comprehensive and continuous review of airport programs, projects, environmental impacts and associated data.

The 2015 EDR Scope includes, but is not limited to, reporting on noise, air quality, and long-term parking management. The 2015 EDR and 2016 ESPR should reflect the proposed connection to the Airport Station, provide updates on the planning and design of the connection, and identify the anticipated ridership, changes in the HOV mode share, and ground access planning considerations.

The MEPA regulations (Section 11.06(2)) indicate that during the course of an ENF review I may review any relevant information from any other source to determine whether to require an EIR, and, if so, what to require in the Scope. To provide context for this project-specific review and because many issues raised by commenters relate to airport-wide operations and impacts, this Certificate refers to documents from the ESPR process (EEA#3247/5146).

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities.

Terminal E is located adjacent to the North Cargo Area, closest to the MBTA Blue Line Airport Station. Land uses in the area of the proposed project include UPS aircraft parking and loading area, the airport's Remain Over Night aircraft parking area, the North Cargo Area equipment storage area, a building occupied by United Parcel Service (UPS), the MBTA Blue Line Airport Station, airport roadways, various short-term and cell phone parking lots, and a gas station.

The project site is located within the coastal zone of Massachusetts. The entirety of the project site is comprised of previously disturbed impervious area. It is not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The project site does not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

The ENF identified the following projects within the vicinity of Terminal E that have been reviewed under MEPA: Terminal A Replacement (EEA#9329), Terminal E Modifications (EEA#9324), Federal Inspection Services (FIS) Facility and West Concourse Project / International Gateway (EEA#9791), and Terminal B, Pier A Improvements/Satellite FIS Facility (EEA#12235).

Permitting and Jurisdiction

The project is undergoing MEPA review and required an ENF pursuant to 301 CMR 11.03(6)(b)(6) because it will be undertaken by a State Agency and results in the expansion of an existing terminal at Logan Airport by greater than 100,000 sf.

The project requires a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC) and may require an Industrial User Permit from the Massachusetts Water Resource Authority (MWRA). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review.

The project requires approval by the Federal Aviation Administration (FAA) for changes to the Airport Layout Plan and, therefore, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the U.S. Environmental Protection Agency.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Environmental Impacts and Mitigation

As described in the ENF, the project includes construction of approximately 500,000 to 700,000 sf of new floor area (for a maximum 1,500,000 sf total), and will increase both water consumption and wastewater generation by approximately 25,600 gallons per day (76,800 gpd total). The project will not create new impervious area and will eliminate approximately 60 parking spaces. The DEIR indicates that the project will accommodate existing and forecasted passenger levels and operations and, therefore, will not increase passenger enplanements or vehicle trips.

Measures to avoid, minimize and mitigate project impacts include reducing air emissions, greenhouse gas (GHG) emissions, and energy consumption compared to existing conditions by improving access to gate plug-ins, pre-conditioned air, and reducing busing operations. In addition, the building is designed to act as a noise barrier to the adjacent residential areas and Memorial Stadium Park.

Review of the DEIR

The DEIR has been filed to provide additional information regarding the necessary details of design and development of the Terminal E expansion to support assessment of potential impacts and has been coordinated with the federal NEPA process. In accordance with my Certificate on the ENF, the Environmental Assessment (EA) as required under NEPA formed the basis of the DEIR.[1] This Certificate applies to the review of the project under MEPA only, and does not restrict the ability of the federal government to act on those aspects of the project subject to NEPA. The DEIR included FAA's draft Finding of No Significant Impact (FONSI). The DEIR described the proposed project, identified existing conditions, described potential environmental impacts and mitigation measures, and provided an expanded discussion of alternatives. It included an update on state, local, and federal permitting and provided a discussion of permitting requirements and the project's consistency with regulatory standards. At Massport's request, the comment period was extended by three weeks to September 9, 2016. C.6

The DEIR identified ongoing projects that are currently under construction and are assumed to be completed prior to commencement of construction for the Terminal E Project. It also identified a potential parking garage, which is predicated on the approval of a draft regulatory change by MassDEP to amend the Logan Airport Parking Freeze Regulation (310 CMR 7.30). The DEIR indicates that the potential parking garage will be subject to MEPA review pursuant to 301 CMR (6)(a)(7) because it will be constructed by a State Agency and will include construction of 1,000 or more new parking spaces. This project is conceptual in nature and the DEIR did not provide a schedule or timeline for its design or construction or for initiating MEPA review. I encourage Massport to consult with the MEPA Office prior to preparing an ENF for this project. C.7

[1] The Federal Aviation Administration (FAA) is reviewing the project as an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA).

Environmental Justice Policy

I have received numerous comment letters regarding environmental justice and concerns that the burden of cumulative noise, air pollution, and traffic impacts associated with growth and increased operations will be borne by neighboring communities, independent of this specific project. The Executive Office of Energy and Environmental Affairs (EEA) Environmental Justice Policy (EJ Policy) was designed to improve protection of low income and communities of color from environmental pollution as well as promote community involvement in planning and environmental decision-making to maintain and/or enhance the environmental quality of their neighborhoods. Massport provided outreach consistent with the spirit and intent of the enhanced public participation provisions of the EJ Policy. Massport requested and was granted an extension of the comment period to provide additional time to review and comment on the DEIR. The meeting notice was published in English and Spanish in the Boston Herald and the East Boston Times. Spanish language translation was also provided at a Public Information Meeting held the evening of August 10, 2016 at the Mario Umana Middle School Academy Auditorium in East Boston. I received many comment letters requesting Massport provide a Spanish language version of the Executive Summary provided with the DEIR filing. Massport has indicated it will provide a Spanish translation of the DEIR Executive Summary. I encourage Massport to continue providing translated Executive Summaries with all future MEPA filings. C.8

Alternatives Analysis

The DEIR included an expanded alternatives analysis that identified the planning metrics, facility requirements, and assumptions used to design the project and to determine the final number of gates based on the passenger projections for year 2030. The DEIR provided a gating analysis for forecast passenger activity and aircraft operations levels to determine the number of gates required to accommodate the volumes of passengers and aircraft that will be arriving and departing at Terminal E during the average weekday peak-hours. As described in the DEIR, Massport has limited control over the scheduling of transatlantic flights, which are subject to lengthy flight times and time zone changes that cause arrival and departure peaks to occur within a relatively short time period. The DEIR indicates that peak hour for international departures will be between 9:00 pm to 10:00 pm and the peak hour for international arrivals will be between 6:00 pm and 7:00 pm. According to the DEIR, approximately 1,954 passengers are projected to depart in 2030 during the peak hour (9:00 pm to 10:00 pm) and 1,885 passengers are projected to arrive during the peak hour (6:00 pm to 7:00 pm). Based on this, the gating analysis indicates that Logan Airport will require an additional seven gates for a total of 19 gates to efficiently support international operations.

The DEIR identified the number of planes that are forced to "hard stand" during peak hours due to lack of available gates under existing, future No-Build, and future Build-Conditions. As described in the DEIR, in the summer of 2015, aircraft scheduling demanded 13 gates, one more than the existing twelve gates. Throughout 2015, only 10 of the existing 12 Terminal E gates were available for use as two were decommissioned to allow for construction of the Terminal E Renovation and Enhancements Project. From April to September 2015, facility constraints at Terminal E resulted in 293 gate-delays, which affected approximately 44,000 passengers and 49 ramp busing operations to remote hardstands which affected over 8,200 passengers. As described in the DEIR, aircraft waiting for gates account for 55-percent of total delays at Terminal E, while busing operations to remote hardstands account for 11-percent of

total delays. According to the DEIR, in the proposed (2030) Build-Condition, only two operations will require use of a "hard stand" and busing, whereas under the No-Build, 17 flights (arrival and departure) per day will require busing operations. The DEIR also included a summary of key aircraft gate and passenger terminal area facility program requirements for the proposed project to address current deficiencies and meet the needs for future anticipated aircraft and passenger handling.

The DEIR evaluated the following alternate configurations of the new terminal area and the North Apron:

- Alternative A: Separate Core Terminal – New linear concourse and terminal core, with new separate curb frontage.
- Alternative B: Concourse Extension – Extension from existing concourse extending westward from the Gate 12 area at the west end of Terminal E.
- Alternative C: Satellite Concourse – New portion of the terminal positioned as a separate two-sided concourse structure with underground passageway connecting the new gates to the existing terminal space.
- Alternative D: Extended Core Terminal *(Preferred Alternative)* – New extension of the existing concourse, terminal core, and terminal frontages.

Each alternative included seven new gates consistent with the need identified in the gating analysis. The key differences among the terminal configuration alternatives relate to efficiency of interior operations, frontage on the adjacent roadway, disruption to the existing operations during construction, and cost. With the exception of the ability to buffer ground noise from ground operations, there is little difference in environmental impacts among the alternatives. Alternative D was selected as it provides the greatest passenger processing efficiency, interior space, and noise buffering benefits compared to the other alternatives. Massport also evaluated three alternative roadway configurations based on the preferred terminal configuration. The three roadway alternatives (Bi-Level S-Curves, Single S-Curve, and Northern Loop Ramps) all extend the roadway frontage to facilitate drop-off and pick-up along the new building area, and realign the roadway ramps servicing Terminal E. The DEIR indicates that the roadway configurations have similar environmental impacts since the limit of work is currently fully developed and that all build options will replicate the existing traffic flow patterns. The Preferred Alternative (Single S-Curve) was selected as it provides the best alignment for traffic operations while minimizing the overall footprint.

Comments on the DEIR continue to request that Massport accommodate more demand at regional airports in lieu of or in conjunction with the proposed project. I acknowledge that long-term strategies to mitigate Logan's impacts will continue to include an emphasis on diverting travel to regional airports and to rail. As indicated in the Certificate on the ENF, regional transportation will continue to be addressed through the ESPR and EDR, not through this project specific review. C.9

GHG Emissions

Because I required an EIR, the project is subject to review under the May 2010 MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol ("the Policy"). The DEIR included an analysis of GHG emissions and mitigation measures that is generally in accordance with the standard requirements of the MEPA GHG Policy and Protocol; however, the FEIR must address C.10

several issues. The DEIR did not address many of the comments and recommendations provided in the DOER ENF comment letter. I refer Massport to DOER's comment letter. In addition, discrepancies exist between the mitigation measures presented in Table 6-1 (Summary of Terminal E Modernization Beneficial Measures), the "Sustainability Features" narrative (Section 6.2.2), the Draft Section 61 Findings (Appendix B), and the information provided in the MEPA Greenhouse Gas Analysis Technical Report (Appendix G). It is unclear which GHG reduction measures have been committed to by the Proponent and which will continue to be evaluated. For example, many measures included in Table 6-1 which summarizes Massport's commitments to beneficial measures are subsequently referred to (in Section 6.2.2 of the narrative) as measures "to-be considered for their feasibility and applicability" during the preliminary design phase and later design phases. As indicated below, the Response to Comments must provide a detailed response to address each of the issues identified in DOER's comment letter and draft Section 61 Findings should be revised accordingly. C.11 C.12 C.13

The Base Case scenario is based on the 8th Edition of the Massachusetts Building Code that includes the International Energy Conservation Code 2012. The eQUEST v.3.64 modeling software was used to perform the GHG analysis. The DEIR indicates that Massport will build the Terminal E project to achieve LEED Silver or higher certification. The DEIR summarized the following design mitigation measures that were modeled in the GHG analysis and proposed for adoption by the Proponent: C.14

- Improved building envelope (wall insulation of U-0.05, roof insulation of U-0.037, improved glazing of U-0.34, and reduced window to wall ration of 25%)
- Improved Air Handling Units (Variable Air Volume with reduced fan power per cfm; dual enthalpy air economizer to maximize benefit of using outdoor air to condition the building; automatic rest of fan static pressure and supply air temperature based on space loading to reduce fan power, cooling energy, and heating energy);
- Efficient water loops with reduced water supply temperature and wider return temperatures to reduce demand on the pumping and fan systems; and
- Reduced interior lighting power density (LPD) of 0.62 W/SF and reduced exterior lighting power of 9.3 kW.

These design measures were not identified in Table 6-1 or specifically identified in the draft Section 61 Findings. They should be incorporated into revised draft Section 61 Findings. The DEIR identifies the several energy conservation measures that were considered and eliminated primarily for concerns regarding constructability, ease of operations and maintenance and cost. Measures that were eliminated include automated reflective interior blinds to reduce solar heat gain, geothermal heat pumps, fan cycling based on occupancy load, and combined heat and power (CHP). I refer the Proponent to DOER' s comment letter which recommends further evaluation of CHP to address Terminal E's service water loads. Massport has indicated that conversion of the equipment at Logan's Central Heating and Cooling Plant will be evaluated as the equipment reaches the end of its useful life. I expect that further evaluation of CHP will be evaluated as part of that process and reported in future EDRs and ESPRS. C.15 C.16 C.17

Massport has committed to evaluate the following energy efficiency measures as project design progresses: dual box minimum, fin tube radiation, energy recovery wheel, dynamic V8 filtration, and implementation of a solar photovoltaic (pv) array. According to the DEIR, these C.18

measures could increase energy savings by 70% compared to the currently proposed project. However, the DEIR does not indicate why these mitigation measures cannot be incorporated into the project design at this time nor does it identify the additional analysis that would be required to inform a determination during subsequent design. In addition, Section 6.2.2 of the DEIR notes that Massport will investigate the feasibility of providing 2.5% of the project's power with on-site renewable energy through the use of Solar PV; and the Greenhouse Gas Analysis Technical Report (Appendix G) indicates that a 300 kW solar PV array may continue to be evaluated for inclusion in the project. As part of this evaluation, Massport should identify the total rooftop area available for a potential solar PV array and perform a financial feasibility analysis. To date Massport has installed a total of approximately 916 kW of solar PV at Logan and Hanscom airports. The FEIR should identify the basis for delaying a decision regarding installation of a solar PV project on the rooftop of Terminal E or, at a minimum, re-affirm the commitment to build it as "solar ready" until subsequent design phases.

C.18

C.19

C.20

C.21

Stationary source GHG emissions associated with the energy use of the proposed Terminal E expansion are estimated to generate 5,850 tpy of CO_2 in the Base Case Scenario. Through the adoption of energy efficiency measures, the Preferred Alternative will reduce CO_2 emissions associated with the terminal expansion by 685 tpy, for a total of 5,165 tpy, or a 11.7 percent decrease. The GHG analysis also evaluated total net new GHG emissions from aircraft, GSE, airside ground access vehicles, and additional energy demand associated with the Terminal E expansion. The FAA's Aviation Environmental Design Tool (AEDT) and EPA's MOVES and NONROAD models were used to calculate the GHG emissions associated with the operations, including aircraft engines, GSE/auxiliary power units (APUs), and ground access vehicles. Changes to operations are estimated to reduce GHG emissions by an additional 5,371 tpy.

Climate Change Adaptation and Resiliency

The DEIR described the project's consistency with Massport's Disaster and Infrastructure Resiliency Planning (DIRP) Study and Floodproofing Design Guide. Terminal E will be above the projected 2070 coastal flood elevation. The Design Guide establishes Design Flood Elevations (DFEs) that are more conservative than existing building code requirements. The DEIR indicates that the first level of the project and associated utilities and critical equipment is generally located above the DFE. In areas where spaces must be located below the DFE, critical areas will be flood proofed or protected through use of the following measures: watertight shields on doors, windows, and louvers; exterior and interior membranes and sealants; drainage collection systems and sump pumps; early warning devices to monitor water levels; sealing electrical conduits and other utilities; back-flow preventer valves on drainage and sanitary sewer piping; and use of flood openings to equalize hydrostatic pressure. The DEIR notes that Massport has consulted with CZM regarding development of coastal resiliency design measures. Massport will continue consultations with CZM and MBTA and to review existing station vulnerabilities, as operations of the Blue Line and this station are important to support Massport HOV goals. Updates on this consultation and the design measures that are considered and/or incorporated into the design to improve the MBTA station's coastal resiliency should be provided in the EDR and ESPR documents.

C.22

Air Quality

The DEIR included an analysis to determine whether and to what extent the proposed project will increase criteria pollutants. The analysis evaluated changes in emissions from aircraft engines, APUs and GSE, airside vehicles, and airport passenger and employee motor vehicles under the 2030 No-Build and 2030 Build scenarios. The FAA's AEDT was used to evaluate changes in emissions from aircraft ground operations. EPA's MOVES and NONROAD models were used to evaluate changes in emissions from ground support equipment and motor vehicle emissions. Results of the analysis indicate that total emissions of all pollutants will decrease within the project area under future conditions with the proposed project compared to future conditions without the project.

	Carbon Monoxide	Volatile Organic Compounds	Nitrogen Oxides	Sulfur Oxides	Particulate $Matter_{10}$	Particulate $Matter_{25}$
2030 No-Build	294 tpy	35 tpy	59 tpy	9 tpy	11 tpy	4 tpy
2030 Build Condition	268 tpy	33 tpy	33 tpy	6 tpy	10 tpy	3 tpy
Percent Change	-9%	-6%	-44%	-33%	-9%	-25%

The DEIR indicates that the reductions are largely due to the availability and use of gate-furnished electricity and air conditioning rather than APUs while parked at hardstands; reduced reliance on GSE to transport passengers, baggage, and cargo; and improved aircraft operational conditions (e.g., less congestion and delay) on the taxiways and aprons. The DEIR indicates that project complies with the applicable emission thresholds contained in the State Implementation Plan (SIP) and will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS). The DEIR quantified temporary construction-related impacts and confirmed that construction-related emissions will not exceed applicable emission thresholds.

Total air quality emissions from all sources at Logan Airport in recent years are significantly less than they were a decade ago; however, the 2014 EDR demonstrated that total emissions are increasing incrementally. The overall reduction is associated with industry trends of accommodating the demands of increasing passenger and cargo activity levels with fewer aircraft operations generating fewer emissions. Massport will continue to assess the applicability of emissions reduction measures to the extent practicable and report on air quality in the ESPR and the EDR.

C.23

Noise

The DEIR asserts that the project will not result in any changes to the number and type of aircraft operations when compared to the Future No-Build Alternative. It indicates that demand is driven by economic and market factors; and, therefore, growth at Logan Airport will continue to occur regardless of the Terminal E project. Cumulative impacts will continue to be addressed through the ESPR and EDR.

C.24

The DEIR included a noise evaluation which evaluated project-related ground noise conditions and the ability of the terminal extension to mitigate noise. The noise model also

identified how changes in the use of Terminal E gates and the North Cargo Area will affect ground noise levels. The extension of Terminal E has been designed to provide a noise barrier between the airport and the community. It will result in reduced noise levels at Jeffries Point, East Boston Memorial Park, and most residential areas in East Boston west of the ramp areas between Route 1A and Putnam Street. Specifically, the project will reduce noise from aircraft ground operations near Terminal E by five to 18 dB and from single event maximum noise levels by two to 15 dB in the Jefferies Point neighborhood. It will reduce noise from aircraft ground operations near Terminal E by three to 15 dB and from single event maximum noise levels by 1 to eleven dB in the Bremen Street area south of Putnam Street to Route 1A. The DEIR indicates that the project will not result in a significant noise increase within the Day-Night Average Sound Level (DNL) 65 dB contour.

I received many letters which identify a particular concern with concentrations of flight tracks and increased flight frequency due to the FAA's area navigation (RNAV) procedures. The primary purpose of the RNAV procedures is to increase safety and operational efficiency. As documented in the ESPR and annual EDR submittals, implementation of several of the RNAV procedures have generated increased noise complaints in some towns surrounding Logan Airport and I have received many comment letters from residents of the Town of Hull on this issue. The procedures themselves have resulted in aircraft at higher altitudes although patterns are concentrated over certain communities. I note that the FAA is implementing the RNAV program nation-wide. This program is separate from and unrelated to the Terminal E Modernization project. Through my review of the ESPR and EDRs, I am aware of The Boston Logan Airport Noise Study (BLANS)[2]; an ongoing and joint effort between the FAA, Massport, and the Logan Airport Citizen Advisory Committee (CAC). The RNAV procedures to Runways 27, 4L, and 33L were subject to review during Phase 3 of the BLANS[3]. The purpose of Phase 3, currently underway, is to identify opportunities to balance the use of Logan's runways and reduce persistent noise over communities. Flight operations are significantly lower than historic levels; however, I acknowledge that projected increases in flight operations will increase cumulative noise impacts compared to existing conditions. As noted previously, the ESPR and EDRs provide a forum and meaningful opportunities for public review of information and analysis related to these issues. I also encourage residents to contact their CAC representatives to identify additional methods to participate in improving the noise environment around Boston-Logan Airport.

C.25

C.26

Construction Period

The DEIR provided additional construction phase information (presented below in the Mitigation Measures section) to identify construction period impacts and measures to control construction traffic, air quality, noise, and water quality impacts.

Mitigation/Draft Section 61 Findings

The DEIR contained a separate chapter on mitigation measures and provided draft Section 61 Findings in an Appendix. It generally describes mitigation measures and contains commitments to mitigation. As noted earlier, additional clarity is necessary regarding those

C.27

[2]Information on the Boston Logan Airport Noise Study can be found at http://www.bostonoverflight.com/index.aspx
[3] These environmental documents can be found at http://www.bostonoverflight.com/phase3_documents.aspx

measures that are commitments and those that will be evaluated as project design progresses. This is particularly relevant to the GHG mitigation measures. The Proponent has committed to implement the following measures to avoid, minimize, and mitigate environmental impacts:

C.27 Cont.

Operational Impacts

- The Terminal E expansion has been sited and will be designed to act as a noise barrier to the adjacent East Boston neighborhoods and Memorial Stadium park to the southwest of the North Apron. The new structures will have a minimum height of 45-ft above ground level.
- New gates will have electric power and pre-conditioned air to allow aircraft to plug in at gate rather than be serviced remotely to reduce need for on-board engine/auxiliary power unit operation, thereby reducing aircraft air emissions and GHG emissions.
- New gates will increase ramp efficiency and reduce movements on North Apron and the need to bus passengers between terminal and remote aircraft parking locations, thereby reducing ground transportation related air emissions and mobile source GHG emissions.
- Roadway and curb improvements which will improve vehicle flow and high-occupancy vehicle access.

Sustainable Design Features/Greenhouse Gas Emissions

- Improved building envelope (wall insulation of U-0.05, roof insulation of U-0.037, improved glazing of U-0.34, and reduced window to wall ratio of 25%).
- Improved Air Handling Units.
- Efficient water loops with reduced water supply temperature and wider return temperatures to reduce demand on the pumping and fan systems.
- Reduced interior lighting power density of 0.62 W/SF and reduced exterior lighting power of 9.3 kW.
- The roof design will incorporate materials with a minimum reflectance rating of 0.70 and emittance value of at least 0.75 for a minimum of 75% of the available roof area. Roofing materials will be non-glare to reduce heat island effect.
- Final design will incorporate infrastructure for collection, storage, and handling of recyclable materials.
- The contractor will be required to develop a construction waste management plan that requires diversion or reduction of construction waste by at least 75%.
- Massport will establish a project-specific goal for sourcing materials extracted, harvested, recovered, and or manufactured within New England.
- The project will be designed to achieve energy efficiencies of a minimum of 20% below the MA Energy Code.
- Continued investigation into the feasibility of supplying 2.5% of the project's power with on-site renewable energy systems.
- The project will be developed to accommodate rooftop solar.
- Project will include water conservation devices that reduce water use by 20% below the MA Plumbing Code.
- Project will incorporate occupancy sensors in all indoor areas to reduce electrical demand.

Construction Period

- Work hours will be limited to 7:00 AM to 5:00 PM unless constrained by operational conditions at the Airport.

- Adequate storage areas for construction supplies will be maintained on airport property.
- Soil Management Plan will be developed based on sub-surface investigations to address identification and disposal of contaminated materials.
- Stormwater Pollution Prevention Plan will be developed to keep sediment and contaminants out of the stormwater management system during construction.
- Management Plan for Dewatering will be developed (if required) to address requirements for testing, handling, and treatment prior to discharge of contaminated groundwater.
- Rodent control, inspection, monitoring, and treatment will be carried out before, during, and after completion of all foundation and utilities demolition and construction work. Rodent extermination prior to work will consist of treatment throughout the project area, including building exteriors and interiors and will continue throughout construction.
- Noise control techniques will be used to reduce noise from pile driving by at least 5 A-weighted decibels (dBA) below unmitigated levels through enclosing the point of impact for the pile drive; installation of an impact cushion between the pile drive and the pile; or requiring the application of energy-absorbing material to steel piles.
- Measures to reduce ground transportation impacts from project construction include:
  - Designated truck routes designed to keep construction-related traffic off of residential streets unless they are seeking construction-related access to or from local businesses.
  - Concrete production/batching will occur in existing plants with access to Route 1A or I-90 to reduce on-airport activities and to consolidate truck trips.
  - Construction companies will be encouraged to provide off-Airport parking for their employees and to provide shuttle services from these locations.
- The following measures will address construction phase air quality impacts:
  - Enforcement of construction vehicle anti-idling provisions;
  - Retrofitting diesel construction equipment with diesel oxidation catalysts and/or particulate filters;
  - Fugitive dust will be controlled via wetting or sweeping and all trucks hauling materials from the construction site will be covered.

Responses to Comments

The Response to Comments should contain a copy of this Certificate and a copy of each comment letter received on the DEIR. Comment letters may be provided electronically on a CD. As many of the comment letters identify similar concerns, the FEIR may contain a thematic response to comments to the extent that they are within MEPA jurisdiction. The response can also refer to future EDRs and/or ESPRs to address issues that are not within the Scope of this review. This directive is not intended, and shall not be construed, to enlarge the scope beyond what has been expressly identified in this Certificate. I recommend that Massport employ an indexed response to comments format, supplemented as appropriate with direct narrative response. C.28 C.29 C.30 C.31 C.32 C.33

The response to comments section should address specific comments from DOER and a revised GHG analysis should be provided, if necessary to provide a meaningful response. The Response to Comments should clarify GHG reduction measures and to demonstrate that GHG emissions will be minimized, avoided, and mitigated to the maximum extent practicable. I expect that the FEIR will provide a comprehensive and thoughtful response to the DOER comment letter and that Massport will consult with DOER prior to filing the Response to Comments. C.34 C.35 C.36

Mitigation/Draft Section 61 Findings

The Response to Comments should include revised draft Section 61 Findings which should include a complete list of all mitigation measures developed through MEPA review of the project, including but not limited to, measures specifically incorporated into the terminal design or operational measures to minimize GHG emissions. The Section 61 findings should clarify which GHG mitigation measures are proposed as mitigation and which will continue to be evaluated. It should reconcile the data contained in Table 6-1, Sustainability Features narrative in Section 6.2.2, and the information provided in the GHG Analysis Technical Report (Appendix G). The revised draft Section 61 Findings should clarify the reduction in GHG emissions (compared to the base case) that is being committed to as mitigation. The draft Section 61 Findings should also identify whether each mitigation commitment will be incorporated or provided as part of Phase 1, Phase 2, or both phases of the project. C.37 C.38 C.39 C.40

To ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed, I require proponents to provide a self-certification to the MEPA Office. Specifically, Massport must provide a certification to the MEPA Office signed by an appropriate professional (e.g., engineer, architect, transportation planner, general contractor) indicating that the all of the mitigation measures proposed in the EIR have been incorporated into the project. Alternatively, Massport may certify that equivalent emissions reduction measures that collectively are designed to reduce GHG emissions by the same percentage as the measures outlined in the EIR, based on the same modeling assumptions, have been adopted. The certification should be supported by plans that clearly illustrate where GHG mitigation measures have been incorporated. For those measures that are operational in nature (i.e. TDM) the Proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving the measures will be obtained. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings included in the EIR. C.41 C.42 C.43

Circulation

In accordance with Section 11.16 of the MEPA Regulations and as modified by this Certificate, Massport should circulate a hard copy of the FEIR to each State and City Agency from which the Proponent will seek permits. Massport must circulate a copy of the FEIR to all other parties that submitted individual written comments. Per 301 CMR 11.16(5), the Proponent may circulate copies of the FEIR to these other parties in CD-ROM format or by directing commenters to a project website address. However, Massport should make available a reasonable number of hard copies to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. Massport should send correspondence accompanying the CD-ROM or website address indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. A CD-ROM copy of the filing should also be provided to the MEPA Office. A copy of the EIR should be made available for review at the following Libraries: Boston Public Library – Main, Connolly, Orient Heights, Charlestown, and East Boston Branches, Chelsea Public Library, Winthrop Public Library, Revere Public Library, Everett Public Library, Milton Public Library, and Hull Public Library. C.44 C.45 C.46 C.47

Conclusion

Based on a review of the DEIR, consultation with State Agencies, and a review of comment letters, I have determined that the DEIR adequately and properly complies with MEPA and its implementing regulations. The Proponent may submit the Response to Comments and draft Section 61 Findings as the FEIR. C.48

September 16, 2016
Date

Matthew A. Beaton

Comments received:

7/28/2016	Greater Boston Convention & Visitors Bureau
8/1/2016	MassEcon
8/1/2016	Murphy, Hesse, Toomey & Lehane, LLP on behalf of the Town of Milton
8/3/2016	Local 22, Construction & General Laborers' Union
8/3/2016	Mary J. Ryan
8/3/2016	Air Impact Relief (AIR) via Aaron Toffler
8/5/2016	American Council of Engineering Compananies of Massachusetts (ACEC/MA)
8/5/2016	Associated Industries of Massachusetts (AIM)
8/10/2016	Conference of Boston Teaching Hospitals
8/11/2016	Boston Financial Services Leadership Council (BFSLC)
8/11/2016	Susanna Starrett
8/12/2016	Massachusetts Business Roundtable
8/14/2016	Magdalena Ayed
8/15/2016	Juan Ramos
8/15/2016	Linda Barber
8/15/2016	Sema Bekiroglu
8/16/2016	Town of Hull, Philip Lemnios, Town Manager
8/16/2016	Edward J. MacLean
8/16/2016	Renee MacLean
8/17/2016	Andrea White
8/17/2016	David Gardner
8/17/2016	Eugene Courier
8/17/2016	Evie Rose
8/17/2016	Herb Zeller
8/17/2016	Hull Neighbors for Quiet Skies
8/17/2016	Ira Fleishman
8/17/2016	Jen Hartnett-Bullen

8/17/2016	Joe Berkeley
8/17/2016	Juliet Floyd
8/17/2016	Karen Delano
8/17/2016	Kathy A. Beitler
8/17/2016	Linda Karoff
8/17/2016	Lisa Borden
8/17/2016	Maria Graceffa
8/17/2016	Mary Schultz
8/17/2016	Michael Doiron
8/17/2016	Michael Parks
8/17/2016	Philip R. Delano
8/17/2016	Richard Monarch
8/17/2016	Robert Stenberg
8/17/2016	Rosanne Bush
8/17/2016	Sallyann Kakas
8/17/2016	Sarah & Harold Chisholm
8/17/2016	Susan Ovans
8/17/2016	Thomas Hardey
8/17/2016	Tim Fox
8/17/2016	Val Woolley
8/18/2016	Betsy Lewenberg
8/18/2016	Jeff Kerr
8/18/2016	Karen Walsh
8/18/2016	Lloyd Emery
8/18/2016	Nancy Curtis
8/18/2016	Robyn Riddle
8/18/2016	Sheila Connor
8/18/2016	Stephen Etkind
8/18/2016	Nicole Dunn
8/18/2016	Patricia Hynes
8/18/2016	Mr. and Mrs. Tomassini
8/18/2016	Pamela Loring
8/18/2016	Canice Thynne
8/18/2016	John Brennan
8/18/2016	James & Barbara Barrow
8/18/2016	Rebecca and Tillmann Hein
8/18/2016	Stephanie B. Shafran
8/18/2016	Diane & George Nassopoulos
8/18/2016	Chris Maher
8/18/2016	Donna Goes
8/18/2016	Liz West
8/18/2016	Mary Devin
8/18/2016	Marjorie E. Wiseman
8/18/2016	Ellen

8/18/2016	Dorothy Tan
8/18/2016	Charleen Tyson
8/19/2016	Searose@comcast.net
8/19/2016	Town of Milton, Board of Selectmen
8/19/2016	Liz Kinkead
8/19/2016	Colleen MacDonald
8/19/2016	A Better City
8/19/2016	Steve West
8/19/2016	Lois Freedman
8/19/2016	Pam Sargent
8/19/2016	Paul Karoff
8/19/2016	Neill K. Ray
8/19/2016	Arlington and Belmont Representatives to the Logan CAC and Massport CAC
8/19/2016	Kathleen T. McCarthy
8/19/2016	William G. McCarthy
8/19/2016	Boston Harbor Now
8/19/2016	Andrew Schmidt
8/19/2016	Alex D. Doucette
8/19/2016	Massachusetts Department of Environmental Protection (MassDEP)
8/20/2016	Robert Banzett
8/22/2016	Association of Independent Colleges and Universities in Massachusetts (AICUM)
8/23/2016	Patricia McKinley
8/23/2016	Maria Argos Barber
8/23/2016	Joshua Acevedo
8/23/2016	Elizabeth Kay
8/25/2016	Elda Prudden
9/6/2016	Tom Carey
9/6/2016	Congressman Michael Capuano
9/7/2016	Greater Boston Chamber of Commerce
9/8/2016	Chris Marchi
9/8/2016	Steve Holt
9/8/2016	Caroline J. Mailhot
9/8/2016	Eneida Figueroa
9/8/2016	Sam Albertson
9/8/2016	Emily Hyman
9/8/2016	Peter I. Dunn
9/8/2016	Mimi L. Callum
9/8/2016	Massachusetts High Technology Council
9/8/2016	Jane O'Reilly
9/9/2016	Roy Avellaneda, Councilor at Large, Chelsea
9/9/2016	Susanna Starrett
9/9/2016	Michael, Allyson, Willa and Miles Simons
9/9/2016	Carlos Rosales
9/9/2016	Margaret Morris

9/9/2016	Kathleen McCauley
9/9/2016	Lindsay Rosenfeld
9/9/2016	John Antonellis
9/9/2016	John Casamassima
9/9/2016	Brian Gannon
9/9/2016	Celeste Ribeiro Myers
9/9/2016	Theresa Teshia Malionek
9/9/2016	Melissa Tyler
9/9/2016	Sandra Nijjar
9/9/2016	Joanne T. Pomodoro
9/9/2016	Air Impact Relief (AIR) via Aaron Toffler
9/9/2016	Alexis Pumphrey
9/9/2016	Maria Eugenia Corbo
9/9/2016	Magdalena Ayed
9/9/2016	Gail Miller
9/9/2016	Daniel Ryan
9/9/2016	Karen Sullivan
9/9/2016	John Walkey
9/9/2016	Edward, Camille & Renee MacLean
9/9/2016	Service Employees International Union (SEIU) 32BJ, District 615
9/9/2016	Alternatives for Community & Environment, Inc. (ACE)
9/9/2016	Judy Gates
9/9/2016	Mary Ellen Welch
9/9/2016	David Aiken
9/9/2016	Kannan Thiru
9/9/2016	Frederick Salvucci
9/9/2016	Neighbors United for a Better East Boston (NUBE)
9/9/2016	Angel C
9/9/2016	Rudi Seitz
9/9/2016	Alfred A. Pucillo
9/9/2016	Lydia Edwards
9/9/2016	Patricia J. D'Amore
9/9/2016	Alexis Daniels
9/9/2016	Tina Kelly
9/9/2016	Barbara McDonough
9/9/2016	Madeleine Steczynski
9/9/2016	Karen Connor
9/9/2016	Regina Marchi
9/9/2016	Roberto Verthelyi
9/9/2016	Vanessa Fazio
9/9/2016	Chrissy Holt
9/9/2016	Liz Nofziger
9/9/2016	Heather Kros
9/9/2016	June Krinsky-Rudder

9/9/2016	Kim Foltz
9/9/2016	Nancy Lee
9/9/2016	Jessica L. Curtis, JD
9/9/2016	Matthew Neave
9/9/2016	Cindy L. Christiansen
9/9/2016	Michael Passariello
9/9/2016	Elizabeth Kay
9/10/2016	Rob Pyles
9/10/2016	Jesse Borthwick
9/10/2016	Steve Passariello
9/10/2016	Carrie Van Horn
9/10/2016	John Tyler
9/10/2016	Kristen D'Avolio
9/10/2016	Craig Belaney
9/10/2016	Cindy M. López
9/10/2016	Laura Macias Grondin
9/10/2016	Sandra Downey
9/10/2016	Christopher A. Zeien
9/10/2016	Carol Doering
9/12/2016	Department of Energy Resources (DOER)
9/13/2016	Anthony M. Majahad
9/13/2016	State Senator Boncore, State Representative Madaro, and City Councilor LaMattina
9/13/2016	Mary Mitchell
9/14/2016	Olena Chuyan
9/14/2016	Julia Howington
9/16/2016	Karen Maddalena
9/16/2016	Boston Transportation Department (BTD)

MAB/PRC/prc

Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Terminal E Modernization Project Final Environmental Assessment/Environmental Impact Report

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1081
http://www.mass.gov/eea

November 10, 2016

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
FINAL ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Terminal E Modernization
PROJECT MUNICIPALITY	: East Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15434
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: October 5, 2016

As Secretary of Energy and Environmental Affairs, I hereby determine that the Final Environmental Impact Report (FEIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA; M.G.L. c.30, ss.61-62I) and with its implementing regulations (301 CMR 11.00). As noted in my Certificate on the Draft EIR (DEIR) issued September 16, 2016, the DEIR fully responded to the Scope contained in the Certificate on the Environmental Notification Form (ENF) and therefore the scope of the Final EIR (FEIR) was limited to a response to comments and draft Section 61 Findings.

Comments received on the FEIR continue to identify concerns regarding existing airport operations and noise levels and potential increases with long-term growth. I have received comment letters from elected officials (including U.S. Congressman Michael E. Capuano, the Milton Board of Selectmen, and Revere Mayor Brian Arrigo), state agencies, environmental advocacy groups, businesses, and residents. The issue of cumulative airport-wide impacts, particularly noise and air quality, is not new to the review of projects at Logan Airport. As noted in past Certificates, the EIR is not intended to address broad concerns associated with airport operations and growth. The venue for addressing cumulative environmental impacts is through the Environmental Status and Planning Reports (ESPR) and Environmental Data Reports (EDR). Through these reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment on the cumulative impacts. This regular updating and reporting on planning and cumulative impacts is unique among State Agencies. It reflects the challenge and complexity of managing and modernizing Logan Airport within a dense, urban

area. It recognizes that the proximity of communities to the Airport warrants an enhanced level of public engagement and a concerted, long-term effort to minimize and mitigate impacts.

Subsequent ESPRs and EDRs will update the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts and update and revise environmental management plans to address impacts. Future submittals will continue to document potential impacts and trends and propose measures to implement the broad goal of maintaining or reducing Logan's overall environmental impacts, even as annual passenger volumes rise in the future. The next ESPR will analyze calendar year 2016 and will likely be filed in 2017 or 2018 and the next EDR will analyze calendar year 2015 and will likely be filed in the fall of 2016.

I note many comments identify a particular concern with concentrations of flight tracks due to the Federal Aviation Administration's (FAA) area navigation (RNAV) procedures. The primary purpose of the RNAV procedures is to increase safety and operational efficiency. As documented in the ESPR and annual EDR submittals, implementation of several of the RNAV procedures have generated increased noise complaints in some towns surrounding Logan Airport. The procedures themselves have resulted in aircraft at higher altitudes and concentration of flight patterns over certain communities. I note that the FAA is implementing the RNAV program nation-wide. This program is separate from and unrelated to the Terminal E Modernization project. Nonetheless, I am aware that Massport and the FAA recently signed a Memorandum of Understanding (MOU) to frame a new process for analyzing opportunities to incrementally reduce noise through changes or amendments to Performance Based Navigation, including RNAV procedures. I commend Massport and the FAA for establishing this agreement, which is a unique project between the FAA and an airport operator. Massport has indicated that this process will incorporate community outreach and public input. I expect that updates on this process will be provided in in future ESPRs and EDRs which will provide an additional forum and meaningful opportunities for public review of information related to these issues.

Over the past year, Massport has engaged in a concerted outreach effort with elected officials, municipalities, and community groups to identify and discuss potential Massport projects, including but not limited to, Terminal E. Massport created the Logan Airport Impact Advisory Group (IAG) to solicit comment and to identify and prioritize projects and programs of significance to the IAG. I commend Massport for its outreach efforts and encourage Massport to continue a productive dialogue with interested stakeholders, including through the IAG.

I have received comments that identify concerns with other potential Massport projects, including the potential parking garage identified in the DEIR, which would require an amendment to the Logan Airport Parking Freeze Regulation (310 CMR 7.30). As noted in the DEIR and previous Certificate, the potential parking garage will be subject to MEPA review pursuant to 301 CMR (6)(a)(7) because it will be constructed by a State Agency and will include construction of 1,000 or more new parking spaces. Subsequent MEPA review will include review of potential environmental impacts and development of project-specific impact avoidance, minimization, and mitigation measures.

Project Description

The project proposes modernizing Boston-Logan International Airport's John A. Volpe International Terminal (Terminal E) with a 560,000-square foot (sf) addition that corrects facility deficiencies and accommodates current and anticipated passenger volumes. The project includes three gates which previously underwent MEPA review (International Gateway Project, EEA #9791) but were not constructed, and four additional aircraft gates, passenger holdrooms, concourse, concessions, and passenger processing areas. The project includes Customs and Border Patrol (CBP) and Federal Inspection Services (FIS) facilities to replace and expand FIS facilities that were originally reviewed under MEPA (Terminal B, Pier A Improvements/Satellite FIS Facility, EEA #12235) but also not constructed. The project includes a direct pedestrian connection between Terminal E and the MBTA Blue Line Airport Station.

Terminal E was constructed in 1974 with 12 gates and served 1.4 million annual passengers. In 2014, it served approximately five million passengers. The DEIR indicated that the current level of passenger activity routinely causes severe congestion in the terminal at peak times, leading to greatly reduced customer service, and inefficient operations in the terminal and gates. According to the DEIR, gate congestion leads to airside delays and inefficiencies on the North Apron. When no gates are available, arriving aircraft and passengers are held on the apron. The DEIR indicated that aircraft must use remote parking facilities at hardstands in the North Cargo Area and passengers are bused to the terminal during peak periods when there are insufficient gates. The DEIR built upon the information presented in the ENF regarding challenges associated with current operations at Terminal E. Massport has clearly demonstrated the need for the project and made a compelling case for the expansion.

The project is proposed in two phases. Phase 1 will be constructed from 2018 – 2022 and will include construction of four new gates with associated passenger holdrooms and elevators/escalators to relieve existing deficiencies and accommodate interim growth. A partial new concourse will be constructed to allow for future expansion to a seven-gate facility at full build-out. Phase 1 will not require modifications to roadway realignment. Phase 2 will be built by 2028 and will provide three additional gates and the MBTA connection. The project will be fully constructed and operational by 2030.

The project will displace ground service equipment (GSE), other airside activities, existing surface parking, the cell phone lot, and the gas station which will be relocated within existing airport boundaries. Relocation of ground facilities that conflict with the new concourse location, including the gas station, will occur in Phase 1.

Environmental Status and Planning Report (ESPR) and Environmental Data Reports (EDRs)

The MEPA environmental review process for Logan Airport occurs on two levels: airport-wide and project-specific. The ESPR and EDR provide a "big picture" analysis of the environmental impacts of current and anticipated levels of airport-wide activities (including aircraft operations and passenger activity), and presents comprehensive strategies to avoid, minimize and mitigate impacts. The ESPR is generally updated on a five-year basis; the most recent ESPR for the year 2011 was filed in April 2013 and it contained updated passenger activity levels and aircraft operations forecasts through 2030. EDRs evaluate environmental conditions for the reporting year as compared to the previous year and are filed in the years

between ESPRs. The most recent EDR for the year 2014 was filed in October 2015. The EDR provided a comprehensive cumulative analysis of the effects of all Logan Airport activities based on actual passenger activity and aircraft operation levels in 2014 and presents environmental management plans for addressing environmental impacts. The ESPR is supplemented by (and ultimately incorporates) the EDRs and the detailed analyses and mitigation commitments that emerge from project-specific reviews. This process provides a comprehensive and continuous review of airport programs, projects, environmental impacts and associated data.

The 2015 EDR Scope includes, but is not limited to, reporting on noise, air quality, and long-term parking management. The 2015 EDR and 2016 ESPR should reflect the proposed connection to the Airport Station, provide updates on the planning and design of the connection, and identify the anticipated ridership, changes in the HOV mode share, and ground access planning considerations.

The MEPA regulations (Section 11.06(2)) indicate that during the course of an ENF review I may review any relevant information from any other source to determine whether to require an EIR, and, if so, what to require in the Scope. To provide context for this project-specific review and because many issues raised by commenters relate to airport-wide operations and impacts, this Certificate refers to documents from the ESPR process (EEA#3247/5146).

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities.

Terminal E is located adjacent to the North Cargo Area, closest to the MBTA Blue Line Airport Station. Land uses in the area of the proposed project include UPS aircraft parking and loading area, the airport's Remain Over Night aircraft parking area, the North Cargo Area equipment storage area, a building occupied by United Parcel Service (UPS), the MBTA Blue Line Airport Station, airport roadways, various short-term and cell phone parking lots, and a gas station.

The project site is located within the coastal zone of Massachusetts. The entirety of the project site is comprised of previously disturbed impervious area. It is not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The project site does not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

The ENF identified the following projects within the vicinity of Terminal E that have been reviewed under MEPA: Terminal A Replacement (EEA#9329), Terminal E Modifications (EEA#9324), Federal Inspection Services (FIS) Facility and West Concourse Project / International Gateway (EEA#9791), and Terminal B, Pier A Improvements/Satellite FIS Facility (EEA#12235).

Permitting and Jurisdiction

The project is undergoing MEPA review and required an ENF pursuant to 301 CMR 11.03(6)(b)(6) because it will be undertaken by a State Agency and results in the expansion of an existing terminal at Logan Airport by greater than 100,000 sf.

The project requires a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC) and may require an Industrial User Permit from the Massachusetts Water Resource Authority (MWRA). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review.

The project requires approval by the Federal Aviation Administration (FAA) for changes to the Airport Layout Plan and, therefore, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the U.S. Environmental Protection Agency.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Environmental Impacts and Mitigation

As described in the ENF, the project includes construction of approximately 500,000 to 700,000 sf of new floor area (for a maximum 1,500,000 sf total), and will increase both water consumption and wastewater generation by approximately 25,600 gallons per day (76,800 gpd total). The project will not create new impervious area and will eliminate approximately 60 parking spaces. The DEIR indicated that the project will accommodate existing and forecasted passenger levels and operations and, therefore, will not increase passenger enplanements or vehicle trips.

Measures to avoid, minimize and mitigate project impacts include reducing air emissions, greenhouse gas (GHG) emissions, and energy consumption compared to existing conditions by improving access to gate plug-ins, pre-conditioned air, and reducing busing operations. In addition, the building is designed to act as a noise barrier to the adjacent residential areas and Memorial Stadium Park.

Review of the FEIR

The FEIR was responsive to the scope issued in the Certificate on the DEIR. It included responses to comments filed on the DEIR and revised draft Section 61 Findings that outline Massport's mitigation commitments for the project. The FEIR included an Executive Summary of the DEIR both in English and a translated version in Spanish. The FEIR included the FAA's revised draft Finding of No Significant Impact/Draft Record of Decision (Draft FONSI/DROD) which was updated since the DEIR. This Certificate applies to the MEPA review of the project.

MEPA review cannot and does not restrict the ability of the federal government to act on those aspects of the project subject to the National Environmental Act (NEPA).

The only change to the project since the review of the DEIR is incorporation of additional mitigation measures to reduce GHG emissions (described below). No other changes to project programming, layout, or anticipated environmental impacts are identified. State Agencies did not request additional MEPA review or identify further analysis that would warrant additional MEPA review.

Response to Comments

The Response to Comments contained a copy of the DEIR Certificate and a copy of each comment letters received on the DEIR. A total of 186 comment letters were provided on the DEIR, of which 120 consisted of form letters. The FEIR contained a summary table that identified each commenter, the issues identified in their comment letter, and the corresponding section(s) of the FEIR to assist in locating the response. The FEIR contained both thematic responses to frequent comments and separate responses to individual comments. I commend Massport for providing a comprehensive response to comments and recognize the time and effort that Massport has invested in the preparation of the FEIR.

Responses to individual comments were provided for state agencies, municipalities, elected officials, and key stakeholders. Thematic responses were provided for the following categories: alternatives, cumulative impacts, environmental justice, ground transportation, health effects, induced growth, MEPA process, mitigation, noise, parking, regionalization, resiliency, RNAV departure procedures, and stakeholder outreach. Many of the comments received on the DEIR identify concerns related to existing airport operations and noise levels and potential increases in impacts associated with long-term growth. As noted in past Certificates, the EIR is not intended to address broad concerns associated with airport operations and growth. The venue for addressing cumulative environmental impacts is through the Environmental Status and Planning Reports (ESPR) and Environmental Data Reports (EDR). The Response to Comments refers to future EDRS and/or ESPRs to address these issues which are not within the Scope of this review.

As required in the Scope, the response to comments section of the FEIR provided a direct response to comments from the Department of Energy Resources (DOER) that clarified the GHG reduction measures proposed for the project and included a revised GHG analysis. Based on the revised analysis, the project incorporated two additional and significant mitigation measures: a 25,000 square feet (sf) rooftop solar photovoltaic (PV) system (300 kW) and solar thermal heating of domestic hot water for public restrooms. These two measures will reduce GHG emissions by 363 tons per year (tpy) compared to the proposed as presented in the DEIR. With these additional mitigation measures, the Preferred Alternative will reduce CO_2 emissions associated with the terminal expansion by 1,390 tpy, for a total of 3,818 tpy, or a twenty-seven percent decrease. The FEIR revised the draft Section 61 findings to reflect the revised mitigation measures.

The FEIR also evaluated and quantified the potential GHG reduction associated with the following five mitigation measures: Dual Box Minimum, Fin Tube Radiation, Energy Recovery Wheel, Dynamic V8 Filtration, and additional 50,000 sf of solar PV panels. The incorporation of

these measures would reduce GHG emissions by fifty-percent. Massport has committed to continue evaluating these measures as design progresses. The FEIR also included an analysis of additional wall, roof, and fenestration improvements which indicated they are not effective GHG reduction strategies for the project. It included an evaluation of solar thermal for the concession-area hot water; however this measure remains under deliberation as concession needs are still being developed.

I acknowledge and appreciate the consultation between Massport and DOER which has resulted in the identification and commitment to additional and significant GHG emission reductions.

Mitigation/Draft Section 61 Findings

The FEIR identified measures to avoid, minimize, and mitigate environmental impacts and included draft Section 61 Findings for use by State Agencies. The FEIR clarified that the timing and responsibility for implementation of each measure. The direct connection to the Airport MBTA Blue Line Station, full sound barrier benefits associated with extending the full width of the terminal, and curb improvements will be implemented during the second phase of the project. The other energy reduction and greenhouse gas reduction measures will be implemented in the first phase of the project. Measures to avoid, minimize, and mitigate environmental impacts include:

Operational Impacts

- The Terminal E expansion has been sited and will be designed to act as a noise barrier to the adjacent East Boston neighborhoods and Memorial Stadium park to the southwest of the North Apron. The new structures will have a minimum height of 45-ft above ground level.
- New gates will have electric power and pre-conditioned air to allow aircraft to plug in at gate rather than be serviced remotely to reduce need for on-board engine/auxiliary power unit operation, thereby reducing aircraft air emissions and GHG emissions.
- New gates will increase ramp efficiency and reduce movements on North Apron and the need to bus passengers between terminal and remote aircraft parking locations, thereby reducing ground transportation related air emissions and mobile source GHG emissions.
- Roadway and curb improvements which will improve vehicle flow and high-occupancy vehicle access.
- Construction of a weather-protected pedestrian connector from the Terminal to the MBTA Airport Blue Line Station (proposed as part of Phase 2).

Sustainable Design Features/Greenhouse Gas Emissions

- Project will seek LEED Certification at the Silver level rating or better and meet or exceed the goals of the MA LEED Plus program.
- Improved building envelope (wall insulation of U-0.05, roof insulation of U-0.037, improved glazing of U-0.34, and reduced window to wall ratio of 25%).
- Improved Air Handling Units.
- Efficient water loops with reduced water supply temperature and wider return temperatures to reduce demand on the pumping and fan systems.
- Reduced interior lighting power density of 0.62 W/SF and reduced exterior lighting power of 9.3 kW.

- The roof design will incorporate materials with a minimum reflectance rating of 0.70 and emittance value of at least 0.75 for a minimum of 75% of the available roof area. Roofing materials will be non-glare to reduce heat island effect.
- Final design will incorporate infrastructure for collection, storage, and handling of recyclable materials.
- Massport will establish a project-specific goal for sourcing materials extracted, harvested, recovered, and or manufactured within New England.
- The project will be designed to achieve energy efficiencies of a minimum of 20% below the MA Energy Code.
- The project will reduce operational-related GHG emissions associated with the Project by a minimum of 30%.
- The project will include water conservation devices that reduce water use by 20% below the MA Plumbing Code.
- The project will be built 'solar ready' to accommodate rooftop solar.
- The Terminal E rooftop will include a minimum 25,000 sf of rooftop solar PV (300 kW).
- Solar thermal PV system will be used to provide hot water for the restrooms.
- Project will incorporate occupancy sensors in all indoor areas to reduce electrical demand.
- Continue to evaluate feasibility of the following measures as design progresses: Energy Recovery Wheel, additional rooftop solar PV, Dual Box Minimum, and Dynamic Filtration.
- A self-certification will be provided to the MEPA office upon completion of the project construction signed by an appropriate professional (e.g. civil engineer, traffic engineer, architect, general contractor) indicating that all of the GHG mitigation measures, or equivalent measures that are designed to collectively achieve the proposed stationary source GHG emission reduction committed to in the FEIR, have been incorporated into the project.

Air Quality

- Project will result in a decrease in carbon monoxide (CO) emissions in the area of Terminal E and the associated aircraft apron by approximately 9%, nitrogen oxide (NO_x) emissions by approximately 44%, and sulfur oxides (SO_x) emissions by approximately 33%.
- Project will result in decrease of Volatile Organic Compounds (VOCs) in the project area by approximately 6% and particulate matter (PM_{10} and $PM_{2.5}$) by approximately 9% and 25%, respectively.

Construction Period Impacts

- Development of a construction waste management plan that requires diversion or reduction of construction waste by a minimum of 75%.
- Use of high efficiency space heating/cooling systems in temporary work spaces.
- Work hours will be limited to 7:00 AM to 7:00 PM unless constrained by operational conditions at the Airport. The sound levels from construction activities will employ measures to voluntarily comply with the City of Boston's noise standards.
- Soil Management Plan will be developed based on sub-surface investigations to address identification and disposal of contaminated materials.
- Implement Indoor Air Quality (IAQ) Management Plan during construction.

- Stormwater Pollution Prevention Plan will be developed to keep sediment and contaminants out of the stormwater management system during construction.
- Soil and groundwater management during construction will be conducted in accordance with the appropriate submittals (i.e., Release Abatement Measures, Immediate Response Actions, and/or Safety Management Plans) and subsurface contamination (if encountered) will be remediated in compliance with the Massachusetts Contingency Plan.
- Measures to reduce impacts from the approximately 60 daily truck trips associated with project construction include:
  - Construction-related traffic will be required to use the North Gate using only state and federal highways and the airport roadway network to keep construction-related traffic off of local East Boston roadways.
  - Use of police detail, as necessary, to manage traffic and ensure public safety.
  - Construction companies will be required to provide off-Airport parking for their employees and to provide shuttle services or other HOV service from these locations.
- The following measures will address construction phase air quality impacts:
  - Contractor will comply with MassDEP's Clean Air Construction Initiative regarding installation of emission control devices (such as diesel oxidation catalyst and/or particulate filters) on equipment;
  - Enforcement of construction vehicle anti-idling provisions;
  - Retrofitting diesel construction equipment with diesel oxidation catalysts and/or particulate filters;
  - Fugitive dust will be controlled via wetting or sweeping and all trucks hauling materials from the construction site will be covered.

Conclusion

Based on a review of the FEIR, comment letters, and consultation with State Agencies, I find that the FEIR adequately and properly complies with MEPA and its implementing regulations. Future EDRs and ESPR submittals will continue to document potential impacts and trends and propose measures to implement the broad goal of maintaining or reducing Logan's overall environmental impacts, even as annual passenger volumes rise in the future. Massport and State Agencies should forward copies of the final Section 61 Findings to the MEPA Office for publication in accordance with 301 CMR 11.12.

November 10, 2016
Date

Matthew A. Beaton

Comments received:

10/08/16 David Waite
10/10/16 Sarah James
10/10/16 Peter Houk
10/15/16 Marjorie Smith
10/18/16 Lahra Tillman

10/18/16 Maureen Wing
10/18/16 Reena Freedman
10/18/16 John Vitagliano
10/21/16 David Bowen
10/21/16 Ken Bader
10/23/16 Estella and David Keefer
10/24/16 Carolann Barrett
10/25/16 Shelia Mooney
10/27/16 Luke Preisner
10/28/16 Frederick Salvucci
10/28/16 Mary Ryan
10/31/16 Amelia Kantrovitz
10/31/16 Caslynn Carambelas and Vaishal Patel
10/31/16 Elizabeth Gazda
10/31/16 Juan Carlos Garzon
10/31/16 Stephen Raymond
10/31/16 Scott Johnson
10/31/16 Julie Vail
11/01/16 Sema Bekiroglu
11/01/16 Catherine Stacy
11/01/16 Cady Landa
11/01/16 Dominica Bonanno
11/01/16 Congressman Michael Capuano
11/01/16 Hull Neighbors for Quiet Skies
11/02/16 Tonya Saccardo
11/02/16 Robert Saccardo
11/02/16 Milton Board of Selectmen
11/02/16 Matthew Stachler, M.D., Ph.D.
11/03/16 Barbara L Lawrence
11/03/16 Magdalena Ayed
11/03/16 City of Lynn, Bill Bochnak, Massport CAC & Logan Airport Member
11/03/16 G. Bernadette Cantalupo, 156 Porter St.
11/03/16 William Schneiderman
11/04/16 Gail Miller
11/04/16 Massachusetts Department of Environmental Protection (MassDEP)
11/04/16 Chris Marchi
11/04/16 James Linthwaite
11/04/16 Catherine Stalberg
11/04/16 Mary Ellen Welch (1 of 2)
11/04/16 Mary Ellen Welch (2 of 2)
11/04/16 Department of Energy Resources (DOER)
11/04/16 Vickie Livermore
11/04/16 City of Revere, Mayor Arrigo
11/04/16 AIR Inc., Aaron Toffler
11/04/16 Deborah Hartman
11/04/16 Mimi Callum
11/04/16 Andrea Vilanova
11/04/16 Ann Jansen
11/04/16 John Casamassima
11/04/16 Alyssa Vangeli
11/04/16 Tara Ten Eyck
11/04/16 Boston Harbor Now

EEA# 15434 FEIR Certificate November 10, 2016

11/07/16 28 Form Letters from Residents of the Porter156 Condominium Association
11/07/16 Jesse Borthwick

MAB/PRC/prc

11

This Page Intentionally Left Blank.

Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Logan Airport Parking Project Environmental Notification Form

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1081
http://www.mass.gov/eea

May 5, 2017

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Logan Airport Parking Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15665
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: April 5, 2017

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G. L. c. 30, ss. 61-62I) and Section 11.03 of the MEPA regulations (301 CMR 11.00), I have reviewed the Environmental Notification Form (ENF) and hereby determine that this project **requires** the preparation of a Mandatory Environmental Impact Report (EIR).

Project Description

As described in the ENF, the project includes the construction of 5,000 additional commercial parking spaces at the Logan International Airport (the "Airport"). The parking spaces will be located on additional floors within the existing Economy Garage and at a new parking garage in the location of the existing Terminal E surface parking lot. Potential phasing of the project and design of the parking structures is being developed; however, the ENF indicates that all 5,000 additional commercial parking spaces will be operational between 2022 and 2024. The ENF indicates that the parking spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport. According to the ENF, the project will reduce

drop-off/pick-up activity at the Airport and will reduce regional air passenger-related vehicle miles traveled (VMT) and associated air emissions.

In addition to the overall air quality benefits, the ENF indicates that Massport is considering additional high occupancy vehicle (HOV) mode improvement measures in conjunction with this project. These include enhancing Logan Express bus service through expanded parking at existing locations and increased frequency of service and expanding the Logan Express service area to new suburban locations and urban/downtown areas based on the success of the Back Bay Logan Express pilot program. The ENF also indicates that Massport is considering purchasing additional Silver Line buses to increase service capacity to the Airport.

Project Background and Context

The number of commercial and employee parking spaces allowed at Logan Airport is regulated by the Massachusetts Department of Environmental Protection (MassDEP) through the Massport/Logan Airport Parking Freeze (310 CMR 7.30), an element of the Massachusetts State Implementation Plan (SIP) under the federal Clean Air Act. The ENF indicates that peak day demand for on-Airport parking has been increasing, resulting in daily demand frequently nearing the Logan Airport Parking Freeze cap. Massport has filed this ENF concurrent with MassDEP's issuance of a draft regulation to amend the Parking Freeze. At Massport's request, the amendment would allow the creation of an additional 5,000 commercial parking spaces at the Airport. The MassDEP public comment period on the proposed regulations will close on May 8th, after this Certificate is issued.

As currently drafted, the regulations would increase the Logan Airport commercial parking freeze limit by 5,000 spaces (from 18,640 to 23,640 spaces) and would increase the total cap to 26,088 commercial and employee parking spaces (comprised of 23,640 commercial spaces and 2,448 employee parking spaces). The draft regulations include a requirement that Massport complete the following studies, each within 24 months of when the final regulations are promulgated, to identify ways to further support alternative transit options to the airport:

1. A study to evaluate the costs, feasibility, and effectiveness of potential measures to improve HOV access to the Airport. The study would consider, among other things, possible improvements to Logan Express bus service and the benefits of adding Silver Line buses with service to the Airport.
2. A study of costs and pricing for different modes of transportation to and from the Airport to identify a pricing structure and the use of revenues so generated to promote the use of HOV modes of transportation by Airport air travelers and visitors. The study will include evaluation of short-term and long-term parking rates and their influence on different modes of Airport transportation.
3. A study of the feasibility and effectiveness of potential operational measures to reduce non-high occupancy vehicle pick-up / drop-off modes of transportation to Logan Airport, including an evaluation of emerging ride-sharing and transportation network company modes.

This Project is contingent upon MassDEP amending the Logan Airport Parking Freeze regulation and EPA approval of an amendment to the SIP. If the regulations are not amended, the

Logan Airport Parking Project cannot proceed. The MassDEP regulatory amendment would provide the larger framework of the Logan Airport Parking Freeze, while project-specific impacts and mitigation measures will be analyzed through the MEPA review process for the Logan Airport Parking Project.

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The preferred locations for the parking structures are the Economy Garage and the Terminal E surface parking lot. The Economy Garage is located in the northwest portion of the Airport campus at the intersection of Service Road and Prescott Street. It is comprised of two levels and provides over 2,700 spaces. The Terminal E surface parking lot is located within the Airport interior and adjacent to Terminal E.

As described in the ENF, the airport is well-served by public transportation and approximately 30% of travelers accessing the Airport arrive via HOV modes. Specifically, the Airport is served by several Massachusetts Bay Transportation Authority (MBTA) public transit routes, including Blue and Silver Lines for the rapid transit system, commuter ferry service, and local and express bus routes. Specifically, Massport provides free shuttle service between the Blue Line Airport Station and all Airport terminals and subsidizes the Silver Line Logan Airport Route (SL1) by providing free outbound Silver Line trips from the Airport on eight Silver Line buses purchased for this route by Massport. Massport also operates an extensive Logan Express Bus service, serving five locations. The airport is also served by other private express bus service and intercity bus service as part of the range of HOV modes available for ground access.

The Economy Garage and the Terminal E parking lot sites are both located within the coastal zone of Massachusetts. Both locations are comprised of previously disturbed impervious area. They are not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The parking lot sites do not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

Environmental Impacts and Mitigation

The project includes construction of 5,000 new commercial parking spaces at two locations. The project is located within previously altered impervious area and will not create new impervious area. According to the ENF, the new spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport while minimizing pick-up and drop-off activity and decreasing regional air passenger-related VMT and associated vehicle emissions. Specifically, the ENF indicates that the project will reduce carbon dioxide (CO_2), volatile organic compounds (VOC), and oxides of nitrogen (NO_x) emissions by

approximately 25% in 2022 and approximately 20% in 2030 as compared to the future No-Build Alternative.

The ENF indicates that expanded overall HOV capacity will be necessary to maintain the current HOV mode share as total passenger trips increase. In addition to the overall project benefits and HOV related measures proposed as part of the amendment to the Logan Parking Freeze, the ENF indicates that Massport is considering undertaking additional HOV measures in conjunction with the construction of the proposed 5,000 parking spaces. These include: enhancing existing Logan Express scheduled bus service; expanding Logan Express scheduled bus service; exploring Logan Express scheduled bus service in the urban/downtown area; and investing in additional MBTA Silver Line buses. In addition, the parking garages may be designed to be certified in the new "Parksmart" program, which applies Leadership in Energy and Environmental Design (LEED) sustainability strategies to structured parking facilities. The ENF indicates that measures to avoid, minimize, and mitigate project impacts will be further defined in the DEIR.

Jurisdiction and Permitting

The project is undergoing MEPA review and requires preparation of a mandatory EIR pursuant to 301 CMR 11.03(6)(a)(7) because it will be undertaken by a State Agency and will construct greater than 1,000 parking spaces in a single location.

The project may require a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review. As indicated above, this project is contingent upon MassDEP amending the Logan Airport Parking Freeze to allow the creation of an additional 5,000 commercial parking spaces at the Airport. Should the draft regulations which propose amending the freeze be promulgated as final, MassDEP will submit the final amended Parking Freeze regulations to the U.S. Environmental Protection Agency (EPA) for approval and incorporation into the SIP.

The project may require approval by the Federal Aviation Administration (FAA), which would trigger review under the National Environmental Policy Act (NEPA).[1] The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the EPA.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

[1] The ENF indicates that the level of NEPA review, if required, will depend on the chosen alternative and will be at the discretion of the FAA.

Review of the ENF

The ENF includes a general description of proposed activities, a conceptual discussion of proposed conditions, a brief analysis of alternative locations, and an executive summary of the project in English and in Spanish. The ENF provides a suggested scope for the DEIR that identifies further analysis and data that will be provided to assess potential impacts and measures to avoid, minimize, and mitigate these impacts. The ENF does not provide project plans nor a description of the parking structures and notes that design of the structures is pending MassDEP amending the Parking Freeze. I expect that the DEIR will be a comprehensive and thorough filing that includes project plans for the Preferred Alternative and demonstrates that impacts have been avoided, minimized, and mitigated to the maximum extent feasible. C.1

Comments

MassDEP comments indicate that the draft Parking Freeze Amendment is under review and public comment is ongoing. Their comments identify design recommendations for the parking structures (including installation of electric vehicle (EV) charging stations and designation of preferred parking spaces for alternative fuel vehicles) request Massport implement measures to increase HOV and transit travel modes to the airport, including those identified by Massport in the ENF and providing incentives to increase HOV use.

Comments from industry and labor groups support the project and identify the economic support that the Airport provides to the region, including jobs, tax revenue, and financing for business growth. Other comments emphasize the importance of Massport implementing additional measures to reduce reliance on single occupancy vehicles (SOV), including those identified by Massport in the ENF. In addition, comments request Massport consider: implementing a toll for vehicles entering or exiting the airport to be used for HOV improvement measures, improving silver line (SL1) service (in addition to adding new vehicles), and improving the shuttle connection between the Blue Line and the terminals. The Scope for the DEIR requires additional information regarding project mitigation measures and methods to sustain and increase HOV mode share. C.2

Alternatives Analysis

The ENF indicates that the planning process considered six alternative on-airport locations for the structured parking facilities. All of the sites are paved and developed areas that are currently used for parking or vehicle storage. The ENF indicates that each of the sites are comparable in terms of regional VMT and emissions reductions since regional access routes will not vary as a result of the garage siting.

- Harborside Drive – Structured parking in location of existing vehicle layover space
- Porter Street – Structured parking over existing taxi pool
- North Cargo Area – Expand Economy Garage in the location of existing surface parking and the Massachusetts State Police building
- Southwest Service Area – Structured parking in location of current bus/limousine pool and overflow parking

- Economy Garage (Preferred Alternative) – Additional spaces above existing garage
- Terminal E Surface Lot (Preferred Alternative) – Structured parking in location of existing surface parking lot

According to the ENF, the Preferred Alternative was selected based on input from the East Boston Logan Impact Advisory Group (LIAG). The ENF indicates that Harborside Drive and Porter Street sites were eliminated due to potential wayfinding and operational challenges and the North Cargo Area was eliminated due to the need to relocate the existing uses. The Southwest Service Area was eliminated as it would require construction of a new parking structure and integration of existing uses into the ground floor. The ENF indicates that the No-Build alternative was eliminated as it would result in higher pollutant emissions and roadway congestion due to the higher VMT associated with the drop-off/pick-up mode. The ENF identifies the Economy Garage and Terminal E Surface Lots as the Preferred Alternative. The ENF indicates the Economy Garage location was selected as the Preferred Alternative because the site access is well defined, it does not require significant changes to existing roadway infrastructure, and it is adjacent to compatible land uses and the Terminal E Surface Lot location was selected due to its proximity to Airport terminals, compatibility with adjacent land uses, and location within the Airport interior to minimize impacts to adjacent communities.

Air Quality

The project is anticipated to shift mode share from drop-off/pick-up modes and result in reductions in regional off-Airport VMT compared to the future No-Build scenario. The project will result in CO_2, VOC, and NO_x reductions of 25.8%, 25.5% and 25.6% (respectively) in 2022 and 20.2%, 20.0%, and 20.2% (respectively) in 2030 as compared to the future No-Build scenario.

The analysis assumes that HOV modes can accommodate the proportional growth in passenger levels. The ENF indicates that Massport will continue to strive to maintain the current HOV mode share levels, and expand overall HOV capacity as total passenger trips increase.

The ENF indicates that an updated air quality analysis will be provided in the DEIR.

GHG Emissions and Sustainability

The project is subject to review under the May 5, 2010 MEPA Greenhouse Gas Emissions Policy and Protocol ("the Policy"). The ENF indicates that Massport will quantify stationary and mobile source emissions (passenger vehicles) generated by the project. Massport has indicated that stationary source emissions will only be evaluated if the garage contains conditioned spaces. I refer Massport to DOER's comment letter which identifies a limited number of GHG measures that should be evaluated regardless of whether the garages include conditioned space.

The ENF identified Massport's efforts to maintain and increase HOV modes, including strategies related to pricing (incentives and disincentives), service availability, service quality, marketing, and traveler information. The ENF indicates that the parking garages may be

designed to be certified in the new "Parksmart" program, which applies LEED sustainability strategies to structured parking facilities.

Noise

The ENF indicates that ground noise impacts will not change significantly as the project will not require proposed relocation of or changes to existing land use. The ENF indicates that the proposed vertical addition to the Economy Garage may act as an additional noise barrier to the adjacent neighborhood.

Construction Period Impacts

The ENF indicates that construction period impacts and associated mitigation measures, including noise, air quality, traffic, solid and hazardous waste, and water quality will be evaluated in the DEIR. It will also describe project phasing and sequencing. Massport participates in MassDEP's Clean Construction Equipment Initiative and requires engine retrofits to reduce exposure to diesel exhaust fumes and particulate emissions. The ENF indicates that construction activities will comply with MassDEP Solid Waste and Air Quality control regulations.

SCOPE

General

The ENF included a proposed scope for the DEIR. It includes an executive summary, project description, alternatives analysis, planning and sustainable design, traffic and multi-modal transportation, air quality and GHG, and construction impacts. In addition to the Scope items proposed in the ENF, the Scope for the DEIR should be supplemented by the additions and modifications identified below.

Project Description and Permitting

The DEIR should include site plans for existing and post-development conditions at a legible scale including the proposed garage structures and any curbside improvements and changes to the on-airport roadways. The DEIR should provide additional information to address construction sequencing and phasing. The DEIR should address traffic volumes and crash rates at the Airport. It should include a description of existing and proposed conditions, including on and off-Airport access, on-Airport circulation, and parking. The project description should address pedestrian and transit connections between the garages and the airport; pedestrian, transit, and vehicular access and egress locations; access and revenue control systems; anticipated rate structures; and identify hybrid, alternative fuel, and EV parking locations. As requested by MassDEP, it should include an evaluation of incorporating EV charging stations into the parking garages and identify the number and location of proposed stations. It should

C.3
C.4
C.5
C.6
C.7

include a discussion of how the construction and design of the garage could facilitate future expansion of EV charging stations if warranted by demand.

C.7 Cont.

As indicated above, the draft amended Parking Freeze regulations would require Massport to complete three studies to identify ways to further support alternative transit options to the Airport. The results of these studies can be used to inform and benefit the development of mitigation measures for the Logan Airport Parking Project. The DEIR should clarify the timeframe for completed studies relative to the timeframe for developing specific mitigation measures for the Logan Airport Parking Project which are identified in the ENF. It should identify any commitments that would be contingent on the completion of a study.

C.8

The DEIR should address ground access considerations associated with the parking structures. It should describe site and design constraints for both locations. It should identify how the Terminal E garage will be designed consistent with the curbside improvements and changes to on-airport runways associated with the Terminal E Modernization Project which will commence construction in 2018. The DEIR should identify and describe any changes to the project since the filing of the ENF and provide an update on permitting. It should include a discussion of permitting requirements and document the project's consistency with regulatory standards, as appropriate.

C.9
C.10
C.11

Alternatives Analysis

The DEIR should expand on the initial alternatives analysis and summarize the findings of and the input provided by the community process that guided site selection. The DEIR should identify the number of parking spaces that could be accommodated at each of the alternative locations and describe in more detail why the Southwest Service Area location was eliminated from consideration. The DEIR should evaluate potential construction phasing and configurations. It should compare and contrast benefits and potential impacts of alternatives in narrative form and in a tabular format. The ENF indicates that the project will provide sufficient parking to accommodate approximately five years of peak-day parking demand if growth trends continue at current rates. The DEIR should identify the planning metrics and analysis used to determine the final number of proposed parking spaces (5,000 spaces).

C.12
C.13
C.14
C.15

Air Quality

As indicated above, the project is anticipated to shift mode share from drop-off/pick-up modes and result in reductions in regional off-Airport VMT compared to the future No-Build scenario. The project will result in CO_2, VOC, and NO_x reductions of 25.8%, 25.5% and 25.6% (respectively) in 2022 and 20.2%, 20.0%, and 20.2% (respectively) in 2030 as compared to the future No-Build scenario. As noted in the ENF, although there has been a long-term trend of decreasing emissions since 1990, airport-wide emissions of VOCs and NO_x are predicted to increase slightly from 2010 to 2030. The ENF indicates that a portion of this increase may be attributed to anticipated increases in air passenger activity levels and associated rise in regional and on-Airport VMT.

The air quality analysis provided in the ENF is predicated on maintaining an approximately 30% HOV mode share and proportional growth in demand for HOV. The DEIR should demonstrate that the HOV programs and any proposed HOV improvement measures will provide the capacity to meet demand associated with growth. Massport has made significant investments in programs to maintain and increase HOV modes and has been recognized as one of the top-ranking airports in terms of HOV/transit mode share. I note the 2015 Environmental Data Report (EDR) indicated that Massport's current ground access goal is to attain a 35.2% HOV mode share when annual air passenger levels reach 37.5 million. The ENF indicates that passenger levels are approaching this level with over 36 million passengers in 2016. To support Massport's investments and extend their benefits, the DEIR should include an evaluation of measures to support HOV use and extend the associated air quality benefits of the program and identify to what extent these measures will contribute towards attaining the future mode share goal. C.16

These additional measures include: increasing the frequency of transit services, expansion of transit services, parking supply, and pricing; and implementation of tolls or charges that can be used to improve HOV measures. I note improvements to reduce idling time of HOV modes (i.e. Logan Express, Blue Line Airport Shuttle, and SL1 Silver Line) will also provide air quality benefits. I refer Massport to comment letters which recommend additional measures to improve HOV and reduce VMT. I note monitoring and reporting on the progress towards achieving the goals and success of the mitigation program can be addressed in the Long-Term Parking Management Plan and future Environmental Status and Planning Reports (ESPRs) and Environmental Data Reports (EDRs) (EEA#3247/5146). C.17 C.18

The DEIR should identify and analyze localized on-Airport, community ground access, and air quality conditions at each of the proposed locations. The updated air quality analysis for existing and future year conditions should evaluate the changes in transportation and air quality emissions. The air quality analysis provided in the ENF should be revised to reflect the proposed construction phasing and timeframe to identify when the air quality benefits associated with reduced VMT will be realized. C.19

GHG Emissions and Sustainability

The DEIR should include an analysis of GHG emissions and mitigation measures in accordance with the standard requirements of the MEPA GHG Policy and Protocol. The analysis should include project-related stationary source emissions (exterior/interior parking structure lighting, ventilation, etc.) and mobile source emissions (passenger vehicles). The DEIR should present an evaluation of mitigation measures as outlined in the comments from the Department of Energy Resources (DOER) as appropriate based on whether the parking structures will contain conditioned spaces. I note that DOER's comments also identify mitigation measures that should be explored absent conditioned space, including but not limited to reduced lighting power densities (LPD) for interior and exterior lighting, parking structure ventilation, and solar photovoltaic (PV) installations. At a minimum, I expect the DEIR will present an evaluation of the feasibility and impact of these measures. This evaluation can be performed as separate calculations in lieu of energy modeling. C.20 C.21 C.22

The DEIR should include an evaluation of rooftop or carport solar PV. It should include a cost analysis to determine the financial feasibility of solar (including potential payback periods) and propose an installation that can be supported by the maximum available roof area (excluding areas dedicated for mechanical equipment) on both parking structures. The DEIR should include the assumed panel efficiency, estimate the electrical output of the system, and estimate annual GHG reductions due to the use of renewable energy instead of electricity or natural gas. The analysis should include a narrative and data to support the Proponent's adoption (or dismissal) of solar PV systems. C.23

The GHG analysis should include an evaluation of the potential GHG emissions of the project's mobile emissions sources using the EPA MOVES emissions model. The DEIR should use data gathered as part of the air quality analysis to determine mobile emissions for Existing Conditions, and the future No-Build, Build, and Build with Mitigation Conditions. The Build with Mitigation Conditions should incorporate measures and associated reductions identified in the Air Quality section above that will support HOV use and extend the associated air quality benefits of the program. C.24

The DEIR should provide emission tables that compare base case emissions in tons per year (tpy) with the Preferred Alternative showing the anticipated reduction in tpy and percentage by emissions source (direct, indirect and transportation). If the garages include conditioned space, information should be provided for each building in a format similar to the example table provided in DOER's comment letter. C.25 C.26

The project is in the conceptual design stage and, as such, provides meaningful opportunities for incorporation of sustainability measures. The DEIR should describe the project's consistency with Massport's Floodproofing Design Guide to demonstrate that the project will incorporate measures into the structure and site design to address potential impacts related to predicted sea level rise. C.27

Noise

The ENF indicates that constructing additional levels on the Economy Garage can serve as an additional noise barrier to the adjacent neighborhood. The DEIR should identify how the sound barrier benefits of the taller garage have been maximized through its design. This evaluation should account for the expanded Terminal E building. C.28

Construction Period Impacts

The DEIR should identify construction period impacts, including noise, air quality, traffic, solid and hazardous waste, and water quality, and identify avoidance, minimization, and mitigation measures. The DEIR should describe the project phasing and sequencing and address how construction will occur to avoid impacting the existing constrained parking supply. It should address construction phasing and whether construction will occur simultaneously with the Terminal E project. C.29 C.30 C.31

Mitigation and Draft Section 61 Findings

The DEIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include draft Section 61 Findings for each area of impact associated with Massport's Preferred Alternative. The DEIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation (either funding design and construction or performing actual construction), and a schedule for implementation. To ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed by the Proponent, I require Proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings included in the DEIR. C.32 C.33 C.34

Response to Comments

The DEIR should contain a copy of this Certificate and a copy of each comment letter received on the ENF. In order to ensure that the issues raised by commenters are addressed, the DEIR should include direct responses to these comments to the extent that they are within MEPA jurisdiction. This directive is not intended, and shall not be construed, to enlarge the scope of the EIR beyond what has been expressly identified in this Certificate. The response can refer to future EDRs and/or ESPRs to address issues that are not within the DEIR Scope. I recommend that Massport employ an indexed response to comments format, supplemented as appropriate with direct narrative response. C.35 C.36 C.37

Circulation

In accordance with Section 11.16 of the MEPA Regulations and as modified by this Certificate, Massport should circulate a hard copy of the DEIR to each State and City Agency from which the Proponent will seek permits. Massport must circulate a copy of the DEIR to all other parties that submitted individual written comments. Per 301 CMR 11.16(5), the Proponent may circulate copies of the DEIR to these other parties in CD-ROM format or by directing commenters to a project website address. However, Massport should make available a reasonable number of hard copies to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. Massport should send correspondence accompanying the CD-ROM or website address indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. A CD-ROM copy of the filing should also be provided to the MEPA Office. A copy of the EIR should be made available for review at the following Libraries: Boston Public Library – Main, Orient Heights, and East Boson Branches, Chelsea Public Library, Winthrop Public Library, and Revere Public Library. C.38 C.39 C.40 C.41 C.42

May 5, 2017
Date

Matthew A. Beaton

Comments received:

4/13/2017	Matthew Barison
4/14/2017	Massachusetts Competitive Partnership (MACP)
4/21/2017	Associated Industries of MA (AIM)
4/18/2017	South Shore Chamber of Commerce
4/21/2017	Association of Independent Colleges and Universities in Massachusetts (AICUM)
4/24/2017	Bill Schmidt, Vice Chairman, Winthrop Board of Health
4/21/2017	Boston Water and Sewer Commission (BWSC)
4/20/2017	Local 22 Construction & General Laborers' Union
4/25/2017	Patricia J. D'Amore
4/25/2017	John Vitagliano
4/25/2017	Frederick Salvucci
4/25/2017	Metropolitan Area Planning Council (MAPC)
4/25/2017	Massachusetts High Technology Council (MAHT)
4/25/2017	Wig Zamore (1 of 4)
4/25/2017	Wig Zamore (2 of 4)
4/25/2017	Wig Zamore (3 of 4)
4/25/2017	Wig Zamore (4 of 4)
4/27/2017	Boston Financial Services Leadership Council
4/27/2017	Department of Energy Resources (DOER)
5/5/2017	Massachusetts Department of Environmental Protection (MassDEP)

MAB/PRC/prc

Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Logan Airport Parking Project Draft Environmental Impact Report

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Kathleen A. Theoharides
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1081
http://www.mass.gov/eea

August 2, 2019

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Logan Airport Parking Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15665
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: June 10, 2019

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62I) and Section 11.08 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Draft Environmental Impact Report (DEIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations. The Massachusetts Port Authority (Massport) must prepare and submit for review a Final Environmental Impact Report (FEIR) in accordance with the Scope provided in this Certificate. The Scope is intended to ensure consistency with other planning documents and ongoing studies and is primarily limited to air quality, greenhouse gas emissions, construction period impacts, responses to comments, and revisions to mitigation measures and draft Section 61 Findings.

As described below, the amended Parking Freeze regulations require Massport to complete three studies to identify ways to further support alternative transit options to and from the Airport. The results of these studies will inform Massport's long-range planning efforts to reduce air passenger-related vehicle miles traveled (VMT) and associated air emissions which will extend the associated air quality benefits of this project. I encourage Massport to amend the 2017 Environmental Status and Planning Report (ESPR), submitted to the MEPA office for

publication in the August 7, 2019 *Environmental Monitor*, to include the completed studies and a summary of their findings. It should also describe how the results have informed Massport's long-range efforts to address VMT and air quality impacts of different ground access modes to/from the Airport and identify recommendations or findings that Massport has already implemented. The completed studies and information identified above should also be provided in the FEIR to support review of these measures.

Project Description

As described in the DEIR, the project includes the phased construction of 5,000 additional commercial parking spaces at the Logan International Airport (the "Airport"). The project will construct a structured parking garage with 2,000 parking spaces in the location of the existing Terminal E surface parking lot followed by the addition of 3,000 new spaces at the Economy Garage through expansion of the existing facility. The Terminal E Garage will open in 2022 and the Economy Garage expansion will open by the end of 2025. The parking spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport. According to the DEIR, the project will reduce drop-off/pick-up activity at the Airport and will reduce regional air passenger-related vehicle miles traveled (VMT) and associated air emissions.

In addition to the overall air quality benefits, the DEIR indicated that Massport is implementing additional high occupancy vehicle (HOV) mode improvement measures in conjunction with this project. These include enhancing Logan Express bus service through expanded parking at existing locations and increased frequency of service and expanding the Logan Express service area to new suburban locations and urban/downtown areas based on the success of the Back Bay Logan Express pilot program. The DEIR also indicated that Massport has committed to purchase additional Silver Line buses to increase service capacity to the Airport. As described in the DEIR, Massport is also planning to centralize transportation network company (TNC) (e.g. Uber, Lyft, etc.) operations (i.e. drop-offs and pick-ups) on the ground floor of the Central Garage complex to reduce congestion outside the terminals. Massport is also evaluating mechanism to decrease the number of TNC drivers that leave the Airport without a passenger (i.e., deadhead trips).

Project Background and Context

The number of commercial and employee parking spaces allowed at Logan Airport is regulated by the Massachusetts Department of Environmental Protection (MassDEP) through the Massport/Logan Airport Parking Freeze (310 CMR 7.30), an element of the Massachusetts State Implementation Plan (SIP) under the federal Clean Air Act. As previously described in the Environmental Notification Form (ENF), peak day demand for on-Airport parking was increasing, resulting in daily demand frequently nearing the Logan Airport Parking Freeze cap. Massport worked with MassDEP on an amendment to the Parking Freeze. The ENF was filed concurrent with MassDEP's issuance of a draft regulation to amend the Parking Freeze to allow the creation of an additional 5,000 commercial parking spaces at the Airport. After the Certificate on the ENF was issued, MassDEP approved the requested parking increase and issued the amended regulation on June 30, 2017. The EPA issued a proposed rule approving the

revision of the SIP and incorporating the amended Parking Freeze on March 6, 2018, and the rule went into effect on April 5, 2018. The MassDEP regulations provide the larger framework of the Logan Airport Parking Freeze, while project-specific impacts and mitigation measures will be analyzed through the MEPA review process for the Logan Airport Parking Project.

The approved regulations increased the Logan Airport commercial parking freeze limit by 5,000 spaces (from 18,640 to 23,640 spaces) and increased the total cap to 26,088 commercial and employee parking spaces (comprised of 23,640 commercial spaces and 2,448 employee parking spaces). The regulations (310 CMR 7.30(8)) require that Massport complete the following studies, each within 24 months of June 30, 2017, to identify ways to further support alternative transit options to the airport:

1. A study to evaluate the costs, feasibility, and effectiveness of potential measures to improve HOV access to the Airport. The study should consider, among other things, possible improvements to Logan Express bus service and the benefits of adding Silver Line buses with service to the Airport.
2. A study of costs and pricing for different modes of transportation to and from the Airport to identify a pricing structure and the use of revenues so generated to promote the use of HOV modes of transportation by Airport air travelers and visitors. The study will include evaluation of short-term and long-term parking rates and their influence on different modes of Airport transportation.
3. A study of the feasibility and effectiveness of potential operational measures to reduce non-high occupancy vehicle pick-up/drop-off modes of transportation to Logan Airport, including an evaluation of emerging ride-sharing and transportation network company modes.

Supplemental information from Massport clarified that the three studies will be completed by September 30, 2019.

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The preferred locations for the parking structures are the Economy Garage and the Terminal E surface parking lot. The Economy Garage is located in the northwest portion of the Airport campus at the intersection of Service Road and Prescott Street. It is comprised of two levels and provides over 2,700 spaces. The Economy Garage has an existing rooftop solar photovoltaic (PV) system on its top level which will be relocated or replaced on the top level of the garage following construction. The Terminal E surface parking lot is located within the Airport interior and adjacent to Terminal E.

The Airport is served by several Massachusetts Bay Transportation Authority (MBTA) public transit routes, including Blue and Silver Lines for the rapid transit system, commuter ferry

service, and local and express bus routes. Specifically, Massport provides free shuttle service between the Blue Line Airport Station and all Airport terminals and subsidizes the Silver Line Logan Airport Route (SL1) by providing free outbound Silver Line trips from the Airport on eight Silver Line buses purchased for this route by Massport. Massport also operates an extensive Logan Express Bus service, serving five locations. The airport is also served by other private express bus service and intercity bus service as part of the range of HOV modes available for ground access.

The Economy Garage and the Terminal E parking lot sites are both located within the coastal zone of Massachusetts. Both locations are comprised of previously disturbed impervious area. They are not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The parking lot sites do not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

Environmental Impacts and Mitigation

The project includes construction of 5,000 new commercial parking spaces at two locations. The project is located within previously altered impervious area and will not create new impervious area. According to the DEIR, the new spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport while minimizing pick-up and drop-off activity and decreasing regional air passenger-related VMT and associated vehicle emissions. Specifically, the DEIR indicates that the project will reduce carbon dioxide (CO_2), volatile organic compounds (VOC), and oxides of nitrogen (NO_x) emissions by 10%, 11%, and 11% in 2022 when the first 2,000 parking spaces are constructed and 12%, 12% and 11% in 2030 when all 5,000 spaces are constructed (respectively) as compared to the future No-Build Alternative.

In addition to the overall project benefits and HOV related measures required as part of the Logan Parking Freeze, the DEIR indicated that Massport is undertaking additional HOV measures in conjunction with the construction of the proposed 5,000 parking spaces. These include: enhancing existing Logan Express scheduled bus service; expanding Logan Express scheduled bus service; exploring Logan Express scheduled bus service in the urban/downtown area; and investing in additional MBTA Silver Line buses. Massport will also centralize TNC operations to reduce on-Airport congestion and evaluate mechanisms to decrease TNC deadhead trips.

Jurisdiction and Permitting

The project is undergoing MEPA review and requires preparation of a mandatory EIR pursuant to 301 CMR 11.03(6)(a)(7) because it will be undertaken by a State Agency and will construct greater than 1,000 parking spaces in a single location. The project may require a modified Sewer Use Discharge Permit from the Massachusetts Water Resources Authority (MWRA).[1]

[1] This potential Permit was not identified in the ENF.

The project may require a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review. The project requires approval by the Federal Aviation Administration (FAA) for changes to the Airport Layout Plan and, therefore, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the EPA.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Review of the DEIR

Massport filed a joint DEIR/EA to satisfy the MEPA and NEPA review processes. This Certificate applies to the review of the project under MEPA only, and does not restrict the ability of the federal government to act on those aspects of the project subject to NEPA. The DEIR described the proposed project, identified existing conditions, described potential environmental impacts and mitigation measures, provided an expanded discussion of alternatives, and an executive summary of the project in English and in Spanish. The DEIR included an update on state, local, and federal permitting and provided a discussion of permitting requirements and the project's consistency with regulatory standards. At Massport's request, the project was subject to an extended 47-day comment period. Massport's consultant provided supplemental information identifying data and assumptions which have been updated since the ENF was submitted to facilitate MEPA review.[2] For purposes of clarity, references to the DEIR in this Certificate include this supplemental information unless otherwise referenced. Comments from state and regional agencies are generally supportive of the project and acknowledge the overall air quality benefits which will be provided by the project. Comments do not request additional analysis in the form of a Supplemental DEIR.

Though the Executive Office of Energy and Environmental Affairs' (EEA) *Environmental Justice (EJ) Policy* is not applicable to this project, Massport provided outreach consistent with the spirit and intent of the enhanced public participation provisions of the EJ Policy. Massport requested and was granted an extension of the comment period to provide additional time to review and comment on the DEIR. The DEIR included a Spanish language version of the Executive Summary and Spanish language translation was also provided at a Public Information Meeting held the evening of June 25, 2019 at the Logan Airport Rental Car Center. I encourage Massport to continue providing translated Executive Summaries with all future MEPA filings.

As described in the DEIR, the location and number of parking spaces has not changed since the ENF was filed. The DEIR included revised analyses (including updated estimates of projected reductions in VMT and air emissions) based on updated mode share data and passenger projections. The analysis in the DEIR was updated based on a future passenger forecast of 50 million air passengers (MAP) in 2030 (46.5 MAP in the ENF), with an increased HOV mode

[2] Emails sent from Stewart Dalzell (Massport) on 7/30/10 and 8/1/19 to Page Czepiga (MEPA Office).

share. The VMT analysis in the ENF assumed a 2.54 % annual passenger growth rate through 2030 while the analysis in the DEIR assumed a growth rate commensurate with the FAA's Fiscal Year (FY) 2018 Terminal Area Forecast (TAF); which represents a 3.1% passenger growth rate through 2030. The passenger mode share distribution in the DEIR assumed a 30.5% HOV mode share, consistent with the findings of the 2016 *Logan Airport Passenger Ground Access Survey* (27.8% in the ENF, based on 2013 survey data). The DEIR also assumes that Massport will continue to implement policies and programs to achieve a 40% HOV mode share goal by 2027 (37.5% in the ENF).

Alternatives Analysis

The location of the Preferred Alternative (Economy Garage, Terminal E surface lot) has not changed since the ENF was filed. The DEIR included an expanded alternatives analysis that evaluated various massing and circulation alternatives for the Terminal E garage. The massing alternatives included various combinations of four to seven levels on the garage's east and west sides. The circulation alternatives included two options to provide access/egress for public vehicles and limousines at the Terminal E garage. The DEIR did not evaluate massing or access alternatives for the Economy Garage. According to the DEIR, the massing and height of the Economy Garage was determined by FAA airspace height restrictions, structural considerations, and cost. The Preferred Alternative for the Terminal E garage includes a pedestrian bridge connection to the Central Garage with five parking levels on the west side and six parking levels on the east side of the pedestrian bridge. The garage will have two access points for public vehicles, a separate access point for limousines, and a vehicle bridge to the Central Garage complex. The vehicular bridge will be used by Massport to transfer vehicles under overflow conditions. The DEIR indicated that this direct connection will remove vehicles from on-Airport circulation, reduce on-Airport VMT, and provide air quality benefits. The Preferred Alternative for the Economy Garage will construct three additional parking levels on top of the existing structure and a six level addition on the facility's south side. The DEIR indicated that the project will provide an adequate number of parking spaces, reduce on-Airport VMT, provide operational efficiencies, is adjacent to compatible land uses and/or Airport terminals, and it will not require significant changes to existing roadway infrastructure. According to the DEIR, the project will provide sufficient parking to accommodate approximately 10 years of peak-day parking demand.

The DEIR included a brief evaluation of construction phasing and configurations. The Terminal E garage will be constructed first to achieve construction efficiencies with other construction projects at the Airport and to provide increased operational flexibility in managing the parking supply. Additionally, the parking supply in the Terminal E garage will compensate for the temporary loss of 1,000 revenue-generating parking spaces associated with centralizing TNC operations in the Central Garage complex.

Air Quality

As described in the DEIR, if the project was not constructed, the commercial parking supply would become more constrained and approximately 77% of "would-be parkers" would switch to drop-off/pick-up modes. The project is anticipated to shift mode share from drop-off/pick-up modes and result in reductions in regional off-Airport VMT and improvements to on-

Airport roadway conditions compared to the future No-Build scenario. The VMT analysis presented in the ENF assumed that all 5,000 spaces would be operational by 2022. The DEIR included a revised analysis that incorporated the construction phasing and evaluated an interim (2022; 2,000 spaces in Terminal E Garage operational) and full-build (2030; both garages operational with 5,000 spaces) scenario. As noted above, the air quality analysis was also revised since the ENF was submitted to reflect updated passenger forecasts, growth rates, and HOV mode share data. This decreased the projected VMT reduction and emissions reductions benefits compared to those presented in the ENF. The project will result in CO_2, VOC, and NO_x reductions of 10%, 11%, and 11% in 2022 and 12%, 12% and 11% in 2030 (respectively) compared to the future no-build scenario. According to the DEIR, the project will comply with the Clean Air Act General Conformity Rule, the SIP, and will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) for these pollutants. The DEIR included the results of a microscale analysis that demonstrated the carbon monoxide (CO) concentrations will be below the NAAQS for both the 1-hour and the 8-hour concentrations.

The analysis is predicated on and Massport has committed to achieving a future HOV mode share goal of 40% by 2027. The DEIR identified the following commitments which Massport plans to implement to improve HOV mode share:

- Providing preferred taxi and TNC line privileges to electric vehicles (EV);
- Training ground transportation personnel to encourage passengers to share rides;
- Increasing Logan Express capacity, measured in available seats, by 10%;
- Purchasing eight more (16 total) MBTA Silver Line buses by 2024 (dependent upon MBTA procurement); and
- Conducting the studies required in the amended Parking Freeze regulations and sharing the findings with MassDEP.

I note monitoring and reporting on the progress towards achieving the goals and success of the mitigation program can be addressed in the Long-Term Parking Management Plan and future Environmental Status and Planning Reports (ESPRs) and Environmental Data Reports (EDRs) (EEA#3247/5146). The DEIR also identified measures Massport will implement to reduce air emissions from Airport operations, including: providing high-speed EV charging stations in taxi, limousine, and TNC lots; working with airlines/tenants to convert commercially available ground source equipment (GSE) to electric power; and working with airlines to increase the use of electric tugs to 60% of aircraft that need re-positioning. I refer Massport to comments from Airlines for America which identify concerns with incorporating measures to reduce emissions from GSE into the draft Section 61 Findings for this project. Comments from the Conservation Law Foundation (CLF) identify additional measures that Massport has agreed to implement to support HOV use and reduce air emissions, including free Blue Line service from the Airport Station for employees, implementation of variable-rate parking and Airport pass-through rate (if warranted based on study results), and incentivizing ride-sharing through reduced fees.

The DEIR indicated that the MBTA Blue Line and Silver Line carry approximately 6% of passengers to/from the airport. This represents an increase of 1,900 total passengers per day in

2030. The DEIR included an analysis of the MBTA's Blue Line ability to accommodate the projected increase in passengers. The analysis assumed passenger loads grew by 1.5% per year to approximate future background growth. The analysis indicated that the Blue Line will have adequate capacity to accommodate the 135 additional weekday evening peak hour passengers boarding at the Airport Station in 2030. As the Silver Line buses are free from the Airport, boarding and alighting data is not collected. Based on this, the DEIR did not evaluate future passenger loads for the Silver Line. The DEIR indicated that Massport will continue to monitor the Logan Express and Massport operated shuttles and will expand the fleet as necessary to ensure they meet Massport customer service requirements. The DEIR indicated that the MBTA's Service Delivery Policy and Massport's policy to expand and improve the Silver Line, Logan Express, and Massport operated shuttles to meet customer service requirements will ensure that public transit services to/from the Airport will have sufficient capacity to accommodate future increases in demand.

Climate Change

Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth (EO 569; the Order) was issued on September 16, 2016. EO 569 recognizes the serious threat presented by climate change and directs agencies within the administration to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for its impacts. The Order seeks to ensure that Massachusetts will meet GHG emissions reduction limits established under the Global Warming Solution Act of 2008 (GWSA) and will work to prepare state government and cities and towns for the impacts of climate change.

The GHG Policy and requirements to analyze the effects of climate change through EIR review is an important part of a statewide strategy. These analyses advance proponents' understanding of the projects contribution and vulnerability to climate change.

Greenhouse Gas Emissions

The project is subject to review under the May 5, 2010 MEPA Greenhouse Gas Emissions Policy and Protocol ("the Policy"). The DEIR indicated that the parking garages will be naturally ventilated and that conditioned space will be limited to mechanical/electrical rooms, elevator lobbies, and cashier booths. The DEIR included a GHG analysis that quantified the CO_2 emissions associated with the project's energy use (stationary sources), primarily associated with interior and exterior lighting. Mobile source GHG emissions were calculated in a similar method as the air quality analysis and were based on the anticipated reduction in VMT under future conditions. Massport has committed to the following measures to reduce GHG emissions:

- External wayfinding system to reduce on-Airport VMT, including dynamic informational signage and a reservation system for passengers to reserve and pre-pay for a parking space;
- Internal wayfinding system to reduce in-facility circulation including parking guidance via level occupancy detection;

- Preferred parking spaces for low-emitting and fuel-efficient vehicles amounting to at least 1% of total spaces;
- Reserved parking spaces for EV amounting to at least 1% of total spaces;
- Installation of EV charging stations to accommodate 150% of demand (including construction of 15 EV charging stations in the Terminal E Garage and 5 in the Economy Garage);
- Reduced lighting power densities (LPD) of 0.09 watts/sf (W/sf) inside the parking garages;
- Occupancy sensors and photocells on all interior and exterior lighting (respectively);
- Installation of a solar photovoltaic (PV) system on the Terminal E garage;
- Relocation or replacement of existing solar PV system at the Economy Garage to the top of the facility's new highest level;
- Building Commissioning; and
- Construction waste recycling.

The solar PV array on the Economy Garage will generate 77,800 kWh/year and result in a GHG reduction of 28 tons per year (tpy). The DEIR indicated Massport will evaluate replacing the existing array with a newer and more efficient solar PV system as project design progresses. The DEIR did not evaluate expanding the footprint of the solar PV canopy. The project will also install a 10,000 sf solar PV canopy on the east side of the Terminal E garage which will generate 250,000 kWh/year and result in a GHG reduction of 89 tpy. The DEIR did not provide documentation to support the proposed size of the solar PV canopies, explain why it is not proposed on the west side of the Terminal E garage or within an increased footprint on the Central Garage, nor identify other constraints to expanding the system size. I refer Massport to comments from the Department of Energy Resources (DOER) which indicates a larger solar PV system may be feasible. Additional analysis of solar PV is required in the FEIR.

The project's stationary source GHG emissions were estimated at 1,333 tpy in the Base Case. Through the adoption of energy efficient lighting, the Preferred Alternative will reduce stationary source GHG emissions by 382 tpy, for a total of 951 tpy, or a 28.6% decrease. This does not include the offsets associated with the facilities' solar PV systems, which are identified above. The project's mobile source emissions are summarized in the below table.

Year	Condition	Regional VMT of "would be parkers"	CO_2 Emissions (tpy)
2017	Existing	327,280	153
2022	No-Build	13,584,217	5,079
	Build/Proposed Project	12,279,027	4,497
	Difference	**1,305,190 (10%)**	**582 (11%)**
2030	No-Build	52,130,253	15,126
	Build/Proposed Project	46,922,626	13,314
	Difference	**5,207,627 (10%)**	**1,812 (12%)**

The DEIR indicated the reduction in mobile source emissions is primarily attributed to the reduction in regional VMT as compared to the future No-Build Alternative. This will be achieved through shifting "would be parkers" from drop-off/pick-up modes to parking; reducing the number of trips associated with "would-be parkers" traveling to and from the Airport; reducing recirculation at the Terminal E curbsides and decreasing on-Airport VMT; and reducing on-Airport emissions related to improved curbside operations at Terminal E as air passengers shift from drop-off/pick-up modes to parking in the garages.

Adaptation and Resiliency

The DEIR included a review of the project's design measures for increasing its resiliency to the effects of climate change. The project will incorporate redundant or back-up power sources to protect against extreme weather conditions that may cause power outages. It will also include drought tolerant landscaping along the façade of the Terminal E Garage to minimize the heat island effect and reduce irrigation needs. Stormwater runoff from the Terminal E garage will be collected and used to offset a portion of cooling tower water consumption at the Central Heating Plant. The DEIR briefly described the project's consistency with Massport's Disaster and Infrastructure Resiliency Planning Study and Floodproofing Design Guide. According to the DEIR, critical equipment and infrastructure will be elevated above future projected flood elevations.

Noise

The DEIR included a noise impact assessment to evaluate the potential changes in noise due to a taller Economy Garage. Aircraft ground operations noise was modeled at 11 locations near the Economy Garage both with and without the height increase. According to the DEIR, 8 locations (located north and northwest of the Economy Garage) will experience a decrease in ground noise due to the shielding from the expansion to the Economy Garage. The remaining 3 locations (located west of the Economy Garage) may experience noise increases ranging from 0.1 to 0.4 dB due to sound from aircraft ground operations reflecting off the taller portion of the Economy Garage. The DEIR indicated that the façade of the Economy Garage will consist of a combination of solid walls and open areas which will limit the potential for noise reflection.

Construction Period

Construction of the Terminal E garage will commence in spring 2020 and will be completed in 2022. The six levels on the east side of the pedestrian bridge will be constructed first, followed by the five parking levels on the west side of the bridge. Construction of the Economy Garage expansion will begin in 2023 and be completed by the end of 2025. Construction of the Economy Garage will start at the west end of the garage and proceed towards the east end. I refer Massport to comments from MAPC which recommend constructing the Economy Garage expansion only if/when warranted by demand.

The DEIR described construction phasing and sequencing and provided additional information to identify construction period impacts and measures to control construction traffic, air quality, noise, and water impacts. The DEIR clarified that the Terminal E garage will be

constructed simultaneously with the Terminal E Modernization Project (EEA# 15434) and Terminal C Canopy, Connector, and Roadway Project. The DEIR described construction equipment requirements and identified anticipated construction period trips and truck routes. The DEIR identified measures to reduce construction period traffic impacts, including: developing specific truck routes, coordinating arrival of large equipment, requiring contractors to park off-site, and development of traffic management plans. Measures to reduce construction period air quality impacts include: limiting vehicle idling, using low- or zero-emissions equipment where practicable; retrofitting construction equipment, dust suppression, stabilizing exposed areas, and suspending construction during high-wind conditions. According to the DEIR, Massport will voluntarily comply with the City of Boston's noise control regulations during construction. Portions of the project site are regulated pursuant to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). According to the DEIR, an Activity and Use Limitation (AUL) is located on the Economy Garage site and a Release Abatement Measure (RAM) Plan must be submitted with MassDEP prior to any subsurface work on this site.

SCOPE

General

The FEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope. It should include a detailed description of the proposed project and identify, describe, and assess the environmental impacts of any changes in the project that have occurred since the filing of the DEIR. This should also identify any analysis that has been revised since the DEIR was filed based on updated data or projections. The DEIR should include updated site plans for existing and post-development conditions at a legible scale.

The FEIR should provide a brief description and analysis of applicable statutory and regulatory standards and requirements, and describe how the project will meet those standards. It should include a list of required State Permits, Financial Assistance, or other State approvals and provide an update on the status of each of these pending actions. The FEIR should confirm the need for a modified Sewer Use Discharge Permit from the MWRA and include updated mitigation measures and draft Section 61 Findings, as appropriate.

Project Description and Permitting

The FEIR should include site plans for existing and post-development conditions at a legible scale including the proposed garage structures and any curbside improvements and changes to the on-airport roadways. The project description should address access and revenue control systems; anticipated rate structures; and identify hybrid, alternative fuel, and EV parking locations. The 2017 ESPR was filed with the MEPA Office during review of the DEIR. The FEIR should confirm that the analyses presented in the DEIR used the most recent data, projections, and assumptions presented in the 2017 ESPR or should include revised analyses, as necessary.

The amended Parking Freeze regulations require Massport to complete three studies to identify ways to further support alternative transit options to the Airport. The results of these studies can inform ways to further support alternative transit options to and from the Airport and extend the associated air quality benefits of the project. Massport anticipates completing the studies by September 30, 2019. As described above, the FEIR should include the completed studies and a summary of the findings. It should also describe how the results have informed Massport's long-range efforts to address VMT and air quality impacts of different ground access modes to and from the Airport and identify measures that Massport has already implemented. The data and findings should be integrated into the FEIR and mitigation commitments should be updated, as appropriate.

Air Quality

The air quality analysis in the DEIR assumed that the policies and programs undertaken by Massport will achieve a 40% HOV mode share goal by 2027. The FEIR should describe how HOV mode share will be monitored to evaluate the effectiveness of the policies and programs in achieving this goal. The FEIR should demonstrate that the HOV programs/policies and any proposed HOV improvement measures will provide the capacity to meet demand associated with growth. Massport has made significant investments in programs to maintain and increase HOV modes and has been recognized as one of the top-ranking airports in terms of HOV/transit mode share. To support Massport's investments and extend their benefits, the FEIR should include an evaluation of measures to support HOV use and extend the associated air quality benefits of the program and identify to what extent these measures will contribute towards attaining the future mode share goal. This evaluation can be supported by the findings of the three studies required by the amended Parking Freeze regulations.

Greenhouse Gas (GHG) Emissions

As recommended by DOER, the FEIR should analyze the feasibility and GHG mitigation benefits of expanding the proposed canopy solar PV arrays. The analysis should estimate the area available for solar canopies on each of the top parking levels, state the assumed panel efficiency, estimate the electrical output of the system, and identify associated GHG reductions. The analysis should be supported by conceptual plans that identify the "usable areas" for potential solar PV canopy systems and other appurtenances. The analysis should evaluate the east and west sides of the Terminal E Garage and the entire top level of the Economy Garage. The analysis should include a narrative and data (such as a solar reflection study/glare analysis) to support the Proponent's adoption (or dismissal) of solar PV as a feasible measure to avoid, minimize or mitigate project-related GHG emissions and Damage to the Environment. As recommended by DOER, the project should be designed and built to accommodate solar in the future so as not to lose a significant rooftop asset in the event that issues effecting feasibility change.

The DEIR included a commitment to install EV charging stations to accommodate 150% of demand. The FEIR should clarify whether this commitment to meet 150% of demand extends to all on-Airport demand or is limited to the Terminal E Garage and Economy Garage. The FEIR should describe how demand for EV charging stations will be monitored and identify triggers for installation of additional EV stations. The FEIR should clarify whether the parking garages will be constructed as "EV-ready" with conduit to support future installation of EV charging station

or discuss how the construction and design of the garage could otherwise facilitate future expansion of EV charging stations if warranted by demand. This was requested in the Scope for the DEIR and was not provided.

The FEIR should identify the specific measures from the U.S. Green Building Council's Parksmart program which will be incorporated into the structured parking facilities.

The FEIR should provide an updated emission table that compares base case GHG emissions with the Preferred Alternative showing the anticipated reduction in tpy and percentage by emissions source (stationary and mobile).

Construction Period Impacts

The FEIR should describe how construction will occur to avoid impacting the existing constrained parking supply. The FEIR should describe how it will comply with M.G.L. c. 21E during construction, including any applicable AULs. As recommended by EPA, the FEIR should confirm that Massport will require its construction contractors to use Ultra Low Sulfur Diesel fuel, and discuss the use of after-engine emissions controls, such as oxidation catalysts or diesel particulate filters. Off-road vehicles are required to use ultra-low sulfur diesel fuel (ULSD).

Mitigation and Draft Section 61 Findings

The FEIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include draft Section 61 Findings for each area of impact associated with Massport's Preferred Alternative. It should include a draft Section 61 Finding for use by the MWRA in issuing the modified Sewer Use Discharge Permit (if required). The FEIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation (either funding design and construction or performing actual construction), and a schedule for implementation. To ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed by the Proponent, I require Proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings included in the DEIR.

Response to Comments

The FEIR should contain a copy of this Certificate and a copy of each comment letter received on the DEIR. In order to ensure that the issues raised by commenters are addressed, the FEIR should include direct responses to these comments to the extent that they are within MEPA jurisdiction. This directive is not intended, and shall not be construed, to enlarge the scope of the FEIR beyond what has been expressly identified in this Certificate. The response can refer to future EDRs and/or ESPRs to address issues that are not within the FEIR Scope. I recommend that Massport employ an indexed response to comments format, supplemented as appropriate with direct narrative response.

Circulation

Massport should circulate the FEIR to those parties who commented on the ENF and/or the DEIR, to any State Agencies from which the Proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. Massport may circulate copies of the FEIR to commenters other than State Agencies in a digital format (e.g., CD-ROM, USB drive) or post to an online website. However, Massport should make available a reasonable number of hard copies to accommodate those without convenient access to a computer to be distributed upon request on a first come, first served basis. Massport should send a letter accompanying the digital copy or identifying the web address of the online version of the FEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. The FEIR submitted to the MEPA office should include a digital copy of the complete document. A copy of the FEIR should be made available for review at the following Libraries: Boston Public Library – Main, Orient Heights, and East Boson Branches, Chelsea Public Library, Winthrop Public Library, and Revere Public Library.

August 2, 2019
Date

K. Theoharides
Kathleen A. Theoharides

Comments received:

06/26/2019 John Vitagliano
07/25/2019 Environmental Protection Agency (EPA)
07/26/2019 Airlines for America
07/26/2019 Conservation Law Foundation (CLF)
07/26/2019 Metropolitan Area Planning Council (MAPC)
08/01/2019 Massachusetts Department of Environmental Protection (MassDEP)
08/02/2019 Department of Energy Resources (DOER)
08/02/2019 Air Impact Relief, Inc. (AIR)

KAT/PRC/prc

This Page Intentionally Left Blank.

Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the Logan Airport Parking Project Final Environmental Impact Report

This Page Intentionally Left Blank.

The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Kathleen A. Theoharides
SECRETARY

Tel: (617) 626-1000
Fax: (617) 626-1081
http://www.mass.gov/eea

January 30, 2020

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
FINAL ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Logan Airport Parking Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15665
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: December 23, 2019

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62I) and Section 11.08 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Final Environmental Impact Report (FEIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations.

Project Description

As described in the FEIR, the project includes the phased construction of 5,000 additional commercial parking spaces at the Logan International Airport (the "Airport"). The project will construct a structured parking garage with 2,000 parking spaces in the location of the existing Terminal E surface parking lot followed by the addition of 3,000 new spaces at the Economy Garage through expansion of the existing facility. The Terminal E Garage will open in 2022 and the Economy Garage expansion will open by the end of 2025. The parking spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport. According to the FEIR, the project will reduce drop-off/pick-up activity at the Airport and will reduce regional air-passenger-related vehicle miles traveled (VMT) and associated air emissions.

In addition to the overall air quality benefits, the FEIR indicated that Massport is implementing additional high occupancy vehicle (HOV) mode improvement measures in conjunction with this project. These HOV mode improvement measures include trip reduction strategies that target different methods in how people get to the airport. Parking strategies are one part of the overall trip reduction strategies which includes enhancing Logan Express bus service through expanded parking at existing locations and increased frequency of service, and expanding the Logan Express service area to new suburban locations and urban/downtown areas based on the success of the Back Bay Logan Express pilot program. The FEIR also indicated that Massport has committed to purchase additional Silver Line buses to increase service capacity to the Airport. Additionally, Massport has just began in December 2019 to centralize transportation network company (TNC) (e.g. Uber, Lyft, etc.) operations (i.e. drop-offs and pick-ups) on the ground floor of the Central Garage complex to reduce congestion outside the terminals. Finally, Massport is evaluating mechanism to decrease the number of TNC drivers that leave the Airport without a passenger (i.e., deadhead trips). These mechanisms include both a program called "rematch" at the Central Garage where TNC drivers come in and drop off passengers for the Airport and then the driver is paired up with a passenger who is leaving the Airport, and also a new fee structure for TNCs that decreases the cost of the ride if the TNC driver does a drop-off and then a pick-up.

Project Background and Context

The number of commercial and employee parking spaces allowed at Logan Airport is regulated by the Massachusetts Department of Environmental Protection (MassDEP) through the Massport/Logan Airport Parking Freeze (310 CMR 7.30), an element of the Massachusetts State Implementation Plan (SIP) under the federal Clean Air Act. As previously described in the Environmental Notification Form (ENF) and the Draft EIR (DEIR), peak daily demand for on-Airport (on-site) parking was increasing, resulting in daily demand frequently nearing the Logan Airport Parking Freeze cap. Massport worked with MassDEP on an amendment to the Parking Freeze. The ENF was filed concurrent with MassDEP's issuance of a draft regulation to amend the Parking Freeze to allow the creation of an additional 5,000 commercial parking spaces at the Airport. After the Certificate on the ENF was issued, MassDEP approved the requested parking increase and promulgated the amended regulation on June 30, 2017. The EPA issued a proposed rule approving the revision of the SIP and incorporating the amended Parking Freeze on March 6, 2018, and the rule went into effect on April 5, 2018. The MassDEP regulations provide the larger framework setting overall caps for the Logan Airport Parking Freeze, while project-specific impacts and mitigation measures were intended to be analyzed through the MEPA review process for the Logan Airport Parking Project.

The approved regulations increased the Logan Airport commercial parking limit by 5,000 spaces (from 18,640 to 23,640 spaces) and increased the total cap to 26,088 commercial and employee parking spaces (comprised of 23,640 commercial spaces and 2,448 employee parking spaces). The regulations (310 CMR 7.30(8)) required that Massport complete the following studies, which were completed on September 30, 2019, to identify ways to further support alternative transit options to the airport:

1. A study to evaluate the costs, feasibility, and effectiveness of potential measures to improve HOV access to the Airport. The study should consider, among other things,

possible improvements to Logan Express bus service and the benefits of adding Silver Line buses with service to the Airport.

2. A study of costs and pricing for different modes of transportation to and from the Airport to identify a pricing structure and the use of revenues so generated to promote the use of HOV modes of transportation by air travelers and visitors to the Airport. The study will include evaluation of short-term and long-term parking rates and their influence on different modes of Airport transportation.
3. A study of the feasibility and effectiveness of potential operational measures to reduce non-high occupancy vehicle pick-up/drop-off modes of transportation to the Airport, including an evaluation of emerging ride-sharing and transportation network company modes.

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The preferred locations for the parking structures are the Economy Garage and the Terminal E surface parking lot. The Economy Garage is located in the northwest portion of the Airport campus at the intersection of Service Road and Prescott Street. It is comprised of two levels and provides over 2,700 spaces. The Economy Garage has an existing rooftop solar photovoltaic (PV) system on its top level which will be relocated or replaced on the top level of the garage following construction. The Terminal E surface parking lot is located within the Airport interior and adjacent to Terminal E.

The Airport is served by several Massachusetts Bay Transportation Authority (MBTA) public transit routes, including Blue and Silver Lines for the rapid transit system, commuter ferry service, and local and express bus routes. Specifically, Massport provides free shuttle service between the Blue Line Airport Station and all Airport terminals and subsidizes the Silver Line Logan Airport Route (SL1) by providing free outbound Silver Line trips from the Airport on eight Silver Line buses purchased for this route by Massport. Massport also operates an extensive Logan Express Bus service, serving five locations. The airport is also served by other private express bus service and intercity bus service as part of the range of HOV modes available for ground access.

The Economy Garage and the Terminal E parking lot sites are both located within the coastal zone of Massachusetts. Both locations are comprised of previously disturbed impervious area. They are not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The parking lot sites do not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

Environmental Impacts and Mitigation

The project includes construction of 5,000 new commercial parking spaces at two locations. The project is located within previously altered impervious area and will not create new impervious area. The new spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport while minimizing pick-up and drop-off activity and decreasing regional air passenger-related VMT and associated vehicle emissions. The project will reduce carbon dioxide (CO_2), volatile organic compounds (VOC), and oxides of nitrogen (NO_x) emissions by 10%, 11%, and 11%, respectively, in 2022 when the first 2,000 parking spaces are constructed and 12%, 12% and 11%, respectively, in 2030 when all 5,000 spaces are constructed, as compared to the future No-Build Alternative.

In addition to the overall project benefits in reducing air pollution, Massport is undertaking additional HOV measures in conjunction with the construction of the proposed 5,000 parking spaces. These include: enhancing and expanding existing Logan Express scheduled bus service; exploring Logan Express scheduled bus service in the urban/downtown area; and investing in additional MBTA Silver Line buses.

Jurisdiction and Permitting

The project is undergoing MEPA review and requires preparation of a mandatory EIR pursuant to 301 CMR 11.03(6)(a)(7) because it will be undertaken by a State Agency and will construct greater than 1,000 parking spaces in a single location.

The project may require a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review. The project requires approval by the Federal Aviation Administration (FAA) for changes to the Airport Layout Plan and, therefore, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the EPA.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Changes since the Filing of the DEIR

The FEIR identified changes to the project since the DEIR was filed. Changes to the new garage in front of Terminal E include a plan is to install an approximately 20,000-square foot (sf) solar PV installation on the garage's eastside. This is an increase from the 10,000-sf solar PV installation proposed in the DEIR. This expanded solar PV system will produce approximately 467,000 kilowatt-hours (kWh) per year, or about 217,000 kWh per year more than the system proposed in the DEIR. This expanded system will offset 50 percent of the proposed garage's total energy (i.e., electricity and natural gas) consumption. In addition, the project will now include construction of additional electric vehicles (EV) charging stations. The DEIR indicated that Massport would install 15 single-port EV charging stations at the new garage in front of Terminal E. The FEIR indicates that Massport, instead, will install 11 double-port stations at this location to accommodate 22 dedicated EV charging parking spaces. As demand grows, Massport

will add EV charging stations to ensure that the garage can accommodate 150 percent of demand.

Changes to the design of the Economy Garage expansion since the filing of the DEIR relate to advancing installation of the additional EV charging stations. The additional EV infrastructure was accelerated to take place at the existing Economy Garage with construction that began in 2019. Massport will also increase the number of EV charging stations as part of the Economy Garage expansion to accommodate 150 percent of demand. Massport has committed to reevaluate the need for the additional 3,000 parking spaces planned as part of the Economy Garage expansion prior to beginning that facility's design and construction process.

Review of the FEIR

Massport filed a joint FEIR and Final Environmental Assessment (Final EIR/EA) to satisfy MEPA, NEPA, and the Federal Aviation Administration's (FAA's) implementing procedures (Order 1050.1F and Order 5050.4B).

This Certificate applies to the review of the project under MEPA only, and does not restrict the ability of the federal government to act on those aspects of the project subject to NEPA or FAA rules. The FEIR described the proposed project, identified existing conditions, described potential environmental impacts and mitigation measures, and provided an expanded discussion of greenhouse gas (GHG) emissions. The FEIR included an update on state, local, and federal permitting and provided a discussion of permitting requirements and the project's consistency with regulatory standards.

Though the Executive Office of Energy and Environmental Affairs' (EEA) *Environmental Justice (EJ) Policy* is not applicable to this project, Massport conducted outreach consistent with the enhanced public participation provisions of the EJ Policy including providing translators at all public meetings, notice of availability of the ENF, DEIR and FEIR in local newspapers in several languages, and translation of the Executive Summary/Introduction for the ENF, DEIR and FEIR.

Alternatives Analysis

The location of the Preferred Alternative (Economy Garage, Terminal E surface lot) has not changed since the ENF was filed. The DEIR included an expanded alternatives analysis that evaluated various massing and circulation alternatives for the Terminal E garage which was expanded in the FEIR. The ENF indicated that the planning process considered six alternative on-airport locations for the structured parking facilities. All of the sites are paved and developed areas that are currently used for parking or vehicle storage. The ENF indicated that each of the sites are comparable in terms of regional VMT and emissions reductions since regional access routes will not vary as a result of the garage siting.

- Harborside Drive – Structured parking in location of existing vehicle layover space
- Porter Street – Structured parking over existing taxi pool
- North Cargo Area – Expand Economy Garage in the location of existing surface parking and the Massachusetts State Police building

- Southwest Service Area – Structured parking in location of current bus/limousine pool and overflow parking
- Economy Garage (Preferred Alternative) – Additional spaces above existing garage
- Terminal E Surface Lot (Preferred Alternative) – Structured parking in location of existing surface parking lot

According to the ENF, the Preferred Alternative was selected based on input from the East Boston Logan Impact Advisory Group (LIAG). The ENF indicated that Harborside Drive and Porter Street sites were eliminated due to potential wayfinding and operational challenges and the North Cargo Area was eliminated due to the need to relocate the existing uses. The Southwest Service Area was eliminated as it would require construction of a new parking structure and integration of existing uses into the ground floor. The ENF indicated that the No-Build alternative was eliminated as it would result in higher pollutant emissions and roadway congestion due to the higher VMT associated with the drop-off/pick-up mode. The ENF identified the Economy Garage and Terminal E Surface Lots as the Preferred Alternative. The ENF indicated the Economy Garage location was selected as the Preferred Alternative because the site access is well defined, it does not require significant changes to existing roadway infrastructure, and it is adjacent to compatible land uses and the Terminal E Surface Lot location was selected due to its proximity to Airport terminals, compatibility with adjacent land uses, and location within the Airport interior to minimize impacts to adjacent communities.

The location of the Preferred Alternative (Economy Garage, Terminal E surface lot) has not changed since the DEIR was filed. The massing and height of the Economy Garage was determined by FAA airspace height restrictions, structural considerations, and cost. The Preferred Alternative for the Terminal E garage includes a pedestrian bridge connection to the Central Garage with five parking levels on the west side and six parking levels on the east side of the pedestrian bridge. The garage will have two access points for public vehicles, a separate access point for limousines, and a vehicle bridge to the Central Garage complex. The vehicular bridge will be used by Massport to transfer vehicles under overflow conditions. This direct connection will remove vehicles from on-Airport circulation, reduce on-Airport VMT, and provide air quality benefits. The Preferred Alternative for the Economy Garage will construct three additional parking levels on top of the existing structure and a six level addition on the facility's south side. The FEIR indicates that the project will provide an adequate number of parking spaces, reduce on-Airport VMT, and provide operational efficiencies; it is also adjacent to compatible land uses and/or Airport terminals, and will not require significant changes to existing roadway infrastructure. According to the FEIR, the project will provide sufficient parking to accommodate approximately 10 years of peak-day parking demand.

The Terminal E garage will be constructed first to achieve construction efficiencies with other construction projects at the Airport and to provide increased operational flexibility in managing the parking supply. Additionally, the parking supply in the Terminal E garage will compensate for the loss of 1,000 revenue-generating parking spaces associated with centralizing TNC operations in the Central Garage complex.

Air Quality

As described in the FEIR, if the project were not constructed, the commercial parking supply would become more constrained and approximately 77% of "would-be parkers" would switch to drop-off/pick-up modes. The project is anticipated to shift mode share from drop-off/pick-up modes and result in reductions in regional off-Airport VMT and improvements to on-Airport roadway conditions compared to the future No-Build scenario. The VMT analysis presented in the ENF assumed that all 5,000 spaces would be operational by 2022. The DEIR included a revised analysis that incorporated construction phasing and evaluated both interim (2022; 2,000 spaces in Terminal E Garage operational) and full-build (2030; both garages operational with 5,000 spaces) scenarios which remain the same in the FEIR. As noted, the project is expected to result in CO_2, VOC, and NO_x reductions of 10%, 11%, and 11%, respectively, in 2022 and 12%, 12% and 11%, respectively, in 2030, compared to the future no-build scenario. According to the FEIR, the project will comply with the Clean Air Act General Conformity Rule, the SIP, and will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) for these pollutants. The FEIR also presented the results of a microscale analysis, which demonstrated the carbon monoxide (CO) concentrations will be below the NAAQS for both the 1-hour and the 8-hour concentrations.

The analysis is predicated on and Massport has committed to achieving a future HOV mode share goal of 40% by 2027. The FEIR identified the following commitments which Massport plans to implement to improve HOV mode share:

- Providing preferred taxi and TNC line privileges to electric vehicles (EV);
- Training ground transportation personnel to encourage passengers to share rides;
- Increasing Logan Express capacity, measured in available seats, by 10%; and,
- Purchasing eight more (16 total) MBTA Silver Line buses by 2024 (dependent upon MBTA procurement).

The FEIR also provides a summary of what Massport has already begun implementing to improve HOV mode share including:

- Relocating Back Bay Logan Express service to the MBTA's Back Bay Station, eliminating the fare from the Airport to Back Bay, and reducing the fare from Back Bay to the Airport from $7.50 to $3.00. This has already resulted in a substantial increase in ridership since the relocation in May 2019.
- Increasing peak-hour frequency on the Logan Express Braintree service from 30-minute to 20-minute headways.
- Advancing a new urban Logan Express service at North Station with free service from the Airport. Buses for the service have been ordered.
- Offering priority access at the Airport Security Line to customers who take Back Bay Logan Express or any mode of water transportation to the Airport.
- Initiating studies of a new suburban Logan Express location with parking.
- Implementing a new Ride App drop-off fee of $3.25 (in addition to the current $3.25 pick-up fee) and providing a discounted fee of $1.50 for shared-ride (such as UberPool and Lyft Line) customers.
- Implementing parking pricing that discourages short-term parking that is associated with pick-up and drop off uses.

- Piloting use of the South Boston Waterfront Emergency Access Ramp to reduce travel time on the MBTA Silver Line service to help encourage use.
- Consolidating Ride App operations at dedicated areas on the ground floor of the Central Garage to make it easier for drivers to pick up arriving air passengers after dropping off departing passengers without having to circulate around the Airport.

I note that further monitoring and reporting on the progress towards achieving the goals and success of the mitigation program can be addressed in future Environmental Status and Planning Reports (ESPRs) and Environmental Data Reports (EDRs) (EEA#3247). The ESPR provides analysis of the environmental impacts associated with current and projected activity levels and presents a comprehensive strategy to minimize impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project specific EIRs. The ESPR is generally updated on a five-year basis. The EDRs are filed in the years between ESPRs. The EDR is a retrospective document that is filed annually and identifies environmental impacts based on actual passenger activity and operations.

In addition to Massports' mitigation measures for this project, Massport has committed to implement additional measures to reduce air emissions from Airport operations, including: providing high-speed EV charging stations in taxi, limousine, and TNC lots; working with airlines/tenants to convert commercially available ground source equipment (GSE) to electric power; and working with airlines to increase the use of electric tugs to 60% of aircraft that need re-positioning.

I refer Massport to comments from the Metropolitan Area Planning Council (MAPC) which identify methods for incorporating measures to reduce emissions for this project and methods for Massport's notification when reevaluating the need for the additional 3,000 parking spaces planned as part of the Economy Garage expansion prior to the start of its construction. Comments from the Conservation Law Foundation (CLF) identify additional measures that Massport has agreed to implement to support HOV use and reduce air emissions, including free Blue Line service from the Airport Station for employees, implementation of variable-rate parking and Airport pass-through rate (if warranted based on study results), and incentivizing ride-sharing through reduced fees.

Climate Change

Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth (EO 569; the Order) was issued on September 16, 2016. EO 569 recognizes the serious threat presented by climate change and directs agencies within the administration to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for its impacts. The Order seeks to ensure that Massachusetts will meet GHG emissions reduction limits established under the Global Warming Solution Act of 2008 (GWSA) and will work to prepare state government and cities and towns for the impacts of climate change.

The GHG Policy and requirements to analyze the effects of climate change through EIR review is an important part of a statewide strategy. These analyses advance proponents' understanding of the projects' contribution and vulnerability to climate change.

Greenhouse Gas Emissions

The project is subject to review under the May 5, 2010 MEPA Greenhouse Gas Emissions Policy and Protocol ("the Policy"). The parking garages will be naturally ventilated and airconditioned space in both will be limited to mechanical/electrical rooms, elevator lobbies, and cashier booths.

The DEIR included a GHG analysis that quantified the CO_2 emissions associated with the project's energy use (stationary sources), primarily associated with interior and exterior lighting. Mobile source GHG emissions were calculated using a similar method as the air quality analysis and were based on the anticipated reduction in VMT under future conditions. The Scope detailed in the DEIR required that FEIR should include analysis on the feasibility and GHG mitigation benefits of expanding the proposed canopy solar PV arrays as recommended by Department of Energy Resources (DOER) during the review of the DEIR.

The analysis provided in the FEIR estimates the area available for solar canopies on each of the top parking levels, states the assumed panel efficiency, estimates the electrical output of the system, and identifies associated GHG reductions. The analysis is also supported by conceptual plans that identify the "usable areas" for potential solar PV canopy systems and other appurtenances. The analysis presented in the FEIR evaluates the east and west sides of the Terminal E Garage and the entire top level of the Economy Garage.

The project's stationary source GHG emissions were estimated at 1,337 tpy in the Base Case. The Preferred Alternative will reduce stationary source GHG emissions by 367 tpy, for a total of 970 tpy, or a 32.5% decrease. The project's mobile source emissions have not changed from the review of the DEIR and are summarized in the below table.

Year	Condition	Regional VMT of "would be parkers"	CO_2 Emissions (tpy)
2017	Existing	327,280	153
2022	No-Build	13,584,217	5,079
	Build/Proposed Project	12,279,027	4,497
	Difference	**1,305,190 (-10%)**	**582 (-11%)**
2030	No-Build	52,130,253	15,126
	Build/Proposed Project	46,922,626	13,314
	Difference	**5,207,627 (-10%)**	**1,812 (-12%)**

The reduction in mobile source emissions is primarily attributed to the reduction in regional VMT as compared to the future No-Build Alternative. As described above, this will be achieved through shifting "would be parkers" from drop-off/pick-up modes to parking; reducing the number of trips associated with "would-be parkers" traveling to and from the Airport; reducing recirculation at the Terminal E curbsides and decreasing on-Airport VMT; and reducing on-Airport emissions related to improved curbside operations at Terminal E as air passengers shift from drop-off/pick-up modes to parking in the garages.

Adaptation and Resiliency

The project's design incorporates measures for increasing its resiliency to the effects of climate change. The project will incorporate redundant or back-up power sources to protect against extreme weather conditions that may cause power outages. It will also include drought tolerant landscaping along the façade of the Terminal E Garage to minimize the heat island effect and reduce irrigation needs. Stormwater runoff from the Terminal E garage will be collected and used to offset a portion of cooling tower water consumption at the Central Heating Plant. The project will be consistent with Massport's Disaster and Infrastructure Resiliency Planning Study and Floodproofing Design Guide. Critical equipment and infrastructure will be elevated above future projected flood elevations. Critical infrastructure that will raised above the designated design flood elevation for the new facilities, as defined by Massport's Floodproofing Design Guide, include incoming electrical and telecommunications lines.

Construction Period

Construction of the Terminal E garage will commence in spring 2020 and will be completed in 2022. The six levels on the east side of the pedestrian bridge will be constructed first, followed by the five parking levels on the west side of the bridge. Massport has agreed to reevaluate the need for the additional 3,000 parking spaces planned as part of the Economy Garage expansion prior to the start of its construction. Currently construction of the Economy Garage expansion will begin in 2023 and be completed by the end of 2025. Construction of the Economy Garage will start at the west end of the garage and proceed towards the east end. I refer Massport to comments from MAPC which recommend constructing the Economy Garage expansion only if/when warranted by demand.

The Terminal E garage will be constructed simultaneously with the Terminal E Modernization Project (EEA# 15434) and Terminal C Canopy, Connector, and Roadway Project. Massport has committed to measures to reduce construction period traffic impacts, including: developing specific truck routes, coordinating arrival of large equipment, requiring contractors to park off-site, and development of traffic management plans. Measures to reduce construction period air quality impacts include: limiting vehicle idling, using low- or zero-emissions equipment where practicable; retrofitting construction equipment, dust suppression, stabilizing exposed areas, and suspending construction during high-wind conditions. Massport will also voluntarily comply with the City of Boston's noise control regulations during construction. Portions of the project site are regulated pursuant to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). An Activity and Use Limitation (AUL) is located on the Economy Garage site. Therefore, a Release Abatement Measure (RAM) Plan must be submitted to MassDEP prior to any subsurface work on this site.

Mitigation and Draft Section 61 Findings

The FEIR includes a separate chapter summarizing proposed mitigation measures. The FEIR also includes an Appendix with draft Section 61 Findings for each area of impact associated with Massport's Preferred Alternative. The FEIR contains clear commitments to implement these mitigation measures, estimates the individual costs of each proposed measure, identifies the parties responsible for implementation (either funding design and construction or performing actual construction), and a schedule for implementation. To ensure that all GHG

emissions reduction measures adopted by Massport in the Preferred Alternative are actually constructed or performed by Massport, Massport has agreed to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. A summary of the measures Massport has committed to implement to avoid, minimize, and mitigate, environmental impacts is provided below. Refer to Appendix C Table 1 on page C-6 of the FEIR for a description which also estimates the individual costs of each proposed measure and identifies the parties responsible for implementation.

Ground Access Improvement and Trip Reduction

- Advance the electrification of ground service equipment, pursuant to which all ground service equipment will be replaced no later than the end of 2027 (as available);
- Expand Logan Express capacity by 10 percent; and,
- Increase the percentage of zero emission taxi, livery, and Ride App vehicles (i.e., those associated with companies such as Uber and Lyft) by providing: high-speed electric vehicle charging stations at all taxi, livery, and Ride App pools; and taxi and Ride App queue priority to electric vehicles (subject to negotiation with companies).

Project Planning and Design

- Accommodating existing and anticipated air passenger demand for parking to reduce the environmentally undesirable drop-off/pick-up mode share and its associated vehicle miles traveled (VMT) and on and off-Airport air emissions;
- Reusing existing developed areas (i.e., the Project sites avoid undeveloped, greenfield lands);
- Selecting Project sites with community input that are in areas already used for parking (i.e., not introducing a new use), are on existing bus/shuttle routes, and are separated from nearby residential communities;
- Providing added noise barrier benefits to nearby residences and recreation areas, in conjunction with the Terminal E Modernization Project, through the expansion of the existing Economy Garage;
- Providing drivers with roadway and parking information through internal and external wayfinding systems to reduce on- Airport and in-garage circulation, as well as associated VMT and air emissions;
- Providing convenient passenger access between the new garage in front of Terminal E and the terminal buildings and to the pedestrian bridge that connects Terminal E to the Central Garage complex (which includes the West and Central Garages);
- Incorporating the following ground access features into the design of the new garage in front of Terminal E: a secondary entrance for public parkers to reduce on-Airport recirculation and associated VMT; a vehicular bridge connected to the Central Garage complex to enable more efficient operational movements by Massport's Ground Transportation Unit; relying on existing roadway infrastructure, bus routes, and signage for the Economy Garage expansion; and, encouraging parkers to pay their fees prior to returning to their vehicles via Massport's pay-by-foot system, which uses automated kiosks to enable the efficient flow of vehicles exiting the garages and reduce vehicle idling and associated air emissions.

Climate Change Adaptation and Resiliency/ Greenhouse Gas Emissions

- Incorporating measures from the U.S. Green Building Council's (USGBC) Parksmart rating system into the Project's technology, structural design, and operation;
- Reducing lighting power densities from a base of 0.19 watts per square foot to a maximum of 0.05 watts per square foot;
- Installing occupancy sensors and photocells on all applicable interior and exterior lighting;
- Installing programmable thermostats, where applicable (i.e., mechanical/electrical rooms);
- Conditioning electrical and telecommunications rooms with split system heat pumps capable of operating at or below temperature of 0°F;
- Designing the parking decks to be open air, negating the need for ventilation systems
- Performing building commissioning in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1-2007;
- Incorporating a solar PV system at the new garage in front of Terminal E capable of offsetting 50 percent of the facility's total energy consumption, including all lighting and power required for its electric vehicle (EV) charging stations;
- Relocating the existing solar PV system at the Economy Garage to the top of the facility's new highest level upon completion of Project construction (the installation of a newer, more efficient system will be evaluated for feasibility as that construction period gets closer);
- Designing and building the proposed garages to accommodate expanded solar in the future as it becomes more cost effective/feasible;
- Reserving parking spaces for alternative fuel vehicles (e.g., EVs) amounting to at least 1 percent of total spaces and assigning preferred parking spaces for other low-emitting and fuel-efficient vehicles amounting to at least another 1 percent of total spaces;
- Installing 11 EV charging stations (22 ports) in the new garage in front of Terminal E;
- Designing and building the proposed garages to accommodate expanded EV charging infrastructure to accommodate 150 percent of demand;
- Providing tire inflation services for each garage to promote increased fuel efficiency and vehicle safety;
- Integrating vertical landscaping into the façade of the new garage in front of Terminal E;
- Planting water-conserving ground landscapes that apply the principles of xeriscaping (e.g., use of native plants);
- Specifying water efficient fixtures and faucets in a staff restroom at the new garage in front of Terminal E;
- Applying durable design principles to extend the facilities' lifespan and avoid greenhouse gas emissions caused by future large-scale construction and renovation activities;
- Preparing/adhering to a preventative maintenance plan to extend facility lifespan and avoid greenhouse gas emissions caused by future large-scale construction and renovation activities;
- Installing and applying only no- or low-volatile organic compound (VOC) coatings, paints, and sealants;
- Installing halon-free fire suppression systems in each garage Massport/ Construction;

- Complying with Massport's Floodproofing Design Guide and elevating critical equipment and systems above the designated design flood elevations;
- Ensuring redundant or back-up power sources to reduce disruption from extreme weather conditions that may cause power outage;
- Performing frequent sweeping (at least monthly) to reduce the need for constant pressure washing and associated water use;
- Implementing an active recycling program to reduce the amount of waste sent to regional landfills/incinerators and to reduce GHG associated with material disposal;
- Displaying educational materials to convey the facilities' environmentally sustainable design and operations;
- Participating in a recognized sustainable purchasing buying program applicable to non-capital equipment/materials; and,
- Implementing environmentally safe cleaning supplies and providing necessary training to use, maintain, and dispose of these products.

Construction Period Mitigation

- Providing on-Airport storage areas for construction materials;
- Developing specific truck routing and/or staging plans for implementation by the various contractors;
- Encouraging construction companies to provide off-Airport parking for their employees and to provide shuttle services from these locations (shuttles are required to use the Coughlin Bypass road to access the Airport);
- Requiring all construction vehicle/equipment to follow anti-idling procedures and all construction managers to provide associated training;
- Requiring the use of low- or zero-emissions equipment, where practicable;
- Requiring the retrofitting of appropriate diesel construction equipment with diesel oxidation catalyst and/or particulate filters;
- Requiring contractors to use Ultra Low Sulfur Diesel Fuel (ULSD);
- Deploying air quality and fugitive dust management best practices, such as reducing exposed erodible surface areas through appropriate materials and equipment staging, covering exposed surface areas with pavement or vegetation in an expeditious manner, and stabilizing soil with cover or periodic watering;
- Requiring trucks to access the Project sites by Route 1A, Interstate 90, Coughlin Bypass road, and the main Airport roadway only or other routes in compliance with transportation safety requirements;
- Prohibiting trucks from using local streets;
- Putting into place an Erosion and Sedimentation Control Program, in compliance with the Stormwater Pollution Prevention Plan, to protect water quality and to minimize construction phase impacts to Boston Harbor; and,
- Deploying spill prevention measures and sedimentation controls throughout the construction phases to prevent pollution from construction equipment and erosion.

Conclusion

Based on a review of the FEIR and comment letters, and consultation with State Agencies, I have determined that the FEIR adequately and properly complies with MEPA and its implementing regulations. The project may proceed to permitting.

January 30, 2020
Date

K. Theoharides
Kathleen A. Theoharides

Comments received:

01/23/2020 Conservation Law Foundation (CLF)
01/23/2020 Metropolitan Area Planning Council (MAPC)

KAT/ACC/acc

This Page Intentionally Left Blank.

B

Comment Letters and Responses

- The 22 comment letters received by the Massachusetts Environmental Policy Act (MEPA) Office on the *2018/2019 Environmental Data Report (EDR)* are reprinted here in the order shown below.
  - Adrian C. Madaro, Representative 1st Suffolk District, Boston, MA
  - Paul Ormond, P.E., Energy Efficiency Engineer – Massachusetts Department of Energy Resources
  - Select Board Town of Milton
  - Staci Rubin, Conservation Law Foundation (CLF)
  - Airport Impact Relief, Incorporated (AIR, Inc.)
  - Dr. Scott Hersey, Air Partners PI
  - Sonja Tengblad, East Boston Resident
  - Stephen H. Kaiser, Principal Civil Engineer
  - Emily Uppal, East Boston Resident
  - Sheila Mooney, Belmont Resident
  - Nancy Timmerman, P.E., Consultant in Acoustics and Noise Control
  - Stephen H. Kaiser, Principal Civil Engineer
  - Eleanor Kebabian, East Boston Resident
  - Teresa Doyle, Jamaica Plain Resident
  - Alyssa Vangeli, East Boston Resident
  - Carla Ceruzzi, East Boston Resident
  - Carrie Van Horn, East Boston Resident
  - David Matheu, Arlington Resident
  - Tania Castro-Daunais, East Boston Resident
  - Carol Walker, Winthrop Resident
  - Frederick P. Salvucci, Senior Lecturer and Senior Research Associate at MIT
  - Deb Pasternak, Sierra Club

This Page Intentionally Left Blank.

Comment Letters

This Page Intentionally Left Blank.

Letter #1

The Commonwealth of Massachusetts
HOUSE OF REPRESENTATIVES
STATE HOUSE, BOSTON, MA 02133-1054

ADRIAN C. MADARO
REPRESENTATIVE
1ST SUFFOLK DISTRICT
ROOM 134
TEL: (617) 722-2400
FAX: (617) 722-2850
Adrian.Madaro@MAhouse.gov

VICE CHAIR:
TRANSPORTATION

POST AUDIT AND OVERSIGHT
CONSUMER PROTECTION AND
PROFESSIONAL LICENSURE

March 29, 2021

The Honorable Kathleen A. Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: Boston Logan International Airport 2018/2019 Environmental Data Report - EEA #3247

Dear Secretary Theoharides:

I write in response to the Logan International Airport 2018/2019 Environmental Data Report (EEA #3247) as submitted. Although ostensibly created to explore environmental data related to Logan Airport operations in 2018 and 2019, there is no doubt, either in the document itself or among participants in this process, that the real focus has now shifted to the effects of the global coronavirus pandemic, and in particular its impact on aviation operations at the Airport. Travel restrictions and health advisories related to the coronavirus pandemic have resulted in a halt to recent trends of rapid expansion of passenger levels and aviation traffic at Logan Airport, as well as short-term declines in both metrics over the past year.

However, as we look to the future through this EDR process, it is important to keep in mind that such reductions are temporary. Vaccines are being administered at faster-than-projected rates, showing great efficacy. The pandemic will end, and widespread air travel will resume. Knowing this, the currently reduced volume of operations at Logan Airport presents an opportunity unmatched in recent years. Able to anticipate the return of pre-2020 air traffic rates, as well as pre-2020 growth rates, Massport must be proactively planning for increased operations in the near future so as not to return to inadequate levels of planning, infrastructure, and mitigation to offset the true effects of rapid expansion. A post-pandemic Logan Airport must not operate with the same pre-2020 unpreparedness, in order to truly offset the environmental and quality-of-life effects on host communities. EDR 2018/2019 must provide a roadmap to "build back better" in the wake of the coronavirus, providing better consideration of the effects of the Airport on neighboring

1-1

1-1

1-2

environmental justice communities, better understanding of the Airport's impacts on these communities through a revised health study and real-time air monitoring, and increased mitigation of these effects through programs such as soundproofing and air filtration. 1-2

As we anticipate the return of pre-pandemic air traffic levels and growth rates at Logan Airport, it is critical that the rate of recovery is not underestimated. Massport has a long legacy, through its EDR and ESPR reports, of chronically underestimating growth rates. Flight operation and passenger level increases at Logan Airport averaged 3.15% over 2018 and 2019, almost triple Massport's 1.1% projected growth rate. Similarly, passenger volumes averaged 5.25% growth during this same period, 3.5 times the ESPR's projected growth rate of 1.5%. While Massport projected an estimated 1.16 million additional passengers over these two years, the actual increase of passengers was about 4.15 million people. These massive miscalculations have deprived the community of the opportunity to meaningfully review the full extent of potential environmental impacts at Logan Airport and, critically, resulted in inadequate planning, infrastructure, and mitigation to offset the true effects of rapid expansion. 1-3 There is good reason to believe that, once travel restrictions are lifted and the health risks surrounding the pandemic cease to be a factor, passenger levels will rebound quickly. The 2018/2019 EDR must ensure that Massport is ready for a quick recovery of passenger levels and growth rates and that adequate measures are in place to mitigate these increases. 1-4

Environmental impacts resulting from growth experienced in 2018/2019 also correspondingly increased during that time frame. Estimates in the EDR reveal that residents exposed to 65 day-night average sound level (DNL) or higher, which are the populations most impacted by Airport noise across the region, have increased by 10%. This noise increase has been exclusively concentrated in East Boston, with the exception of a small section of Chelsea, even as noise levels in some other areas have reduced. EDR 2018/2019 also reported a 17% increase in nighttime operations at the Airport during its reporting period. Such nighttime operations may cause health issues for residents in neighboring communities, contributing to problems associated with sleep interruption, hypertension, and some neurological disorders. Levels of nitrogen oxides (NOx) increased by 7%, carbon monoxide (CO) pollution rose by 16%, and emissions of fine particulates (PM 2.5-10) increased by 19%, all key predictors of respiratory illness.

In addition, traffic associated with the Airport has continued to be a problem for surrounding communities. Over the reporting period, vehicle miles travelled associated with the Airport increased by 6.7%, simultaneous with reported drops in public transit ridership. Much of the increase in traffic has been associated with transit network company (TNC) vehicles. In 2019 alone, more than 25% of Airport traffic was TNC related, contributing, in the EDR's own words, to "unprecedented congestion on Airport roadways", as well as the roadways of surrounding communities. We also know that 2018 alone saw the addition of 12 million new transit network company (TNC) rides to and from Logan Airport, with 5 million of those rides being dead-head trips with no passengers. In the wake of the coronavirus pandemic, there have been disconcerting reports about large-scale declines in transit use and high-occupancy vehicles, with HOV use reported to be down by as much as 84% over the past year, and single-occupancy vehicles filling in the gaps. As Logan Airport looks toward a recovery in operations from the coronavirus pandemic, Massport must prioritize a return to public transit and HOV to prevent a resurgence in traffic conditions. 1-5

A direct consequence of the continued underestimation of growth in Massport's environmental disclosure documents has been the failure to provide adequate solutions to issues associated with expansion and appropriate mitigation to deal with increased impacts such as those described above. Because these documents chronically underestimate forecasted growth, we have failed to advance viable solutions to transportation issues associated with Airport passenger access and measures to mitigate the effects of noise and pollution. Had these forecasts more accurately estimated the growth we have seen in recent years, a more rigorous transportation plan could have been put in place to head off our current transportation challenges in the region, and more robust noise abatement measures and air quality programs implemented to protect the health and wellbeing of neighboring communities. As we face a situation in which a temporary reduction in operations has led to a short-term respite from the full scale of these impacts as experienced in recent years, it underscores the need to not underestimate the potential rate of recovery, and to better prepare and mitigate for a resurgence of those levels of operations.

The consequences of unmitigated Airport growth have had serious effects in recent years. Traffic to and from Logan Airport has been a major contributor to the current regional transportation crisis in and around East Boston. Our transit system cannot function efficiently without additional investment, and such planning and investment that accurately account for growth at Logan Airport cannot be implemented when forecasts have consistently been a fraction of the actual increases. As we pursue solutions to these congestion issues, it is essential that we have accurate estimates of Logan Airport rate of recovery from the coronavirus pandemic as well as future growth so that these increases can be accounted for in planning the future of our transportation system. 1-6

A number of long-term transit infrastructure improvements would be beneficial to decreasing the traffic footprint caused by Logan Airport, and its subsequent burdens both on Logan's passengers and the region as a whole. Investments to the Blue Line, including signal upgrades and the construction of the Red Line-Blue Line connector, would allow for increased capacity and frequency going toward downtown, as well as providing a direct connection to important economic corridors along the Red Line. Construction of a Silver Line Underpass at D Street would allow the Silver Line to operate more efficiently and bypass some of the traffic issues it currently faces. The ESPR would also be enhanced by further discussion and analysis of the impacts of high-speed rail and water transportation projects, as well as Airport regionalization strategies and the potential effects of Airport ground access fees. These projects, while important, are not presently considered under the EDR. While this infrastructure is not solely the responsibility of Massport, these forms of transit serve or would serve significant numbers of Logan Airport passengers, and increasing their capacity and efficiency is vital to improving transit to and from the Airport. In the wake of the pandemic, Massport cannot continue to look only at on-campus solutions to transit issues exacerbated by Logan operations, which have permeated well beyond the confines of their borders. Massport should examine how they can contribute to the realization of these regional improvements in conjunction with MassDOT, the MBTA, and other relevant stakeholders. 1-7 1-8 1-9

While long-term improvements will take time to design and construct, there are many other infrastructure and operational improvements that can be achieved in a much shorter time frame. The reconfiguration of pick-up and drop-off facilities for TNCs at Logan Airport, implemented shortly before the pandemic, was a good first step toward making the rideshare system more efficient and reducing deadhead trips. While there was not much time to evaluate its effects before pandemic-related travel restrictions began, Massport should continue to monitor and make 1-10

improvements to this system so that a resurgence in TNC ridership to the Airport does not mean a return to pre-pandemic traffic issues. 1-10

However, the most important post-pandemic priority will be to ensure a return of passengers to high-occupancy vehicles and to dissuade the extensive use of single-occupancy vehicle travel to and from Logan Airport. Improvements to the Logan Express service offer some of the greatest potential to reduce traffic impacts associated with Logan Airport. By increasing the frequency, availability, and affordability of Logan Express, Massport can make the service more attractive to passengers, reducing customer reliability on private vehicles and TNCs. Additionally, with more dedicated bus lanes, buses would be seen as a faster alternative to traffic-burdened TNCs, especially for travelers who are concerned with making their flights on time. Prior to the pandemic, Massport made many important efforts to improve the Logan Express service in terms of locations, availability, cost, priority security clearance benefits, and other benefits to make usage more attractive to passengers. However, during the coronavirus pandemic, Logan Express has seen cuts to service commensurate with reduced travel. Massport must anticipate a resurgence in travel with restored and robust Logan Express options. Like with public transit, levels of availability must pre-empt a rise in ridership, to provide adequate capacity and promote the service as an attractive, convenient option to deter riders from single-occupancy vehicle and TNC usage. Massport must engage in a campaign to promote the public health, safety, and efficiency of HOV options such as Logan Express for passengers returning to the air post-pandemic. 1-11

Worsening air pollution and noise exposure which has resulted from pre-pandemic expansion has also been of great import, as well as the inadequate acknowledgement and mitigation of the associated health consequences. Aircraft and ground support activity necessary to increase passenger volumes far beyond forecasted levels had, before the pandemic, created significant escalation in noise and pollution, which carry serious public health implications. Massport should take responsibility for increasing noise abatement and pollution control measures to a magnitude at least equal to that of current and planned expansions. Updating the Preferential Runway Advisory System (PRAS) is essential to regional noise mitigation, and would be an effective component of this document's evaluation. Additionally, decreasing the impact of nighttime flights by diverting activity to overwater air traffic corridors should be vigorously pursued. Massport should also explore all legal and logistical pathways to imposing increased landing fees on nighttime flights. Schools within the 60 DNL contour, and within the 65 DNL contour in particular, should receive increased soundproofing assistance in order to protect from the exceptional amount of excess noise pollution caused by aircraft operations. It is critical that the widespread effects of noise pollution are thoroughly mitigated as noise contours continue to adjust and, in places like East Boston, intensify in densely populated areas. 1-12 1-13 1-14 1-15 1-16

Increased ground access and airfield activity are also responsible for rising emissions of pollutants such as NOx, ultrafine particulates, and other gases and particulate matter. The health impacts of such pollutants are a serious issue with substantial public health impacts for communities surrounding Logan Airport. It has been well-established that proximity to Logan Airport has resulted in a higher incidence of asthma, COPD, and other health conditions, especially respiratory illnesses, among host communities. It is no coincidence that host communities such as East Boston, like other environmental justice communities across the Commonwealth exposed to higher levels of air pollution and suffering from correspondingly higher incidents of respiratory illnesses, have experienced higher rates of coronavirus infection throughout the pandemic. East Boston has cumulatively been not only the hardest-hit community in Boston, but also one of the most affected 1-16

communities across Massachusetts, for much of the pandemic. Although there are many social and economic factors for these high infection rates, there is no doubt that increased vulnerability due to higher rates of respiratory illness associated with Logan Airport pollution has been a contributing factor to East Boston's coronavirus rates.

It is of vital importance that Massport take steps to mitigate these harmful emissions directly and effectively. The long-term benefits of the emissions reduction strategies outlined in the 2018/2019 EDR are an important part of this mitigation and must be rigorously pursued. However, surrounding communities continue to be impacted by harmful concentrations of pollutants as a result of Airport activity. Recent research by Olin College and Tufts University further indicate that such pollutant concentrations largely persist in indoor environments. Therefore, an important part of mitigation must be indoor air filtration strategies in residences, community spaces, and schools, which have shown effectiveness in reducing concentrations of pollutants in these spaces. Massport should begin this mitigation by providing and maintaining HEPA air purifiers to schools within a 2-mile radius of Logan Airport. As students across the Commonwealth begin to return to the classroom, these HEPA air purifiers will provide substantial pollution-reduction benefits in spaces where our children spend a substantial part of their daily lives, engaged in classes, sports, and extracurricular activities. These benefits have the potential to mitigate many of the proven health risks developed during childhood as a result of long-term exposure to these pollutants. School-based HEPA air filtration mitigation offers an important opportunity to address high rates of childhood asthma and other illnesses, and as such, Massport must not hesitate to provide them. 1-17 1-18

Additionally, a revised Logan Airport Health Study would be beneficial in helping to better understand the effects of this pollution, and better define their specific relationship to health impacts. While the original Airport Health Study, released in 2014, achieved many important objectives, such as focusing on nearby communities, establishing enhanced incidents of asthma and COPD, there is still much more work to be done to fully understand the impacts of Logan Airport on the health of neighboring communities. A revised health study, with proper funding and conducted in a more timely manner, focused on establishing associations with pollutant levels, improved spatial resolution, and time exposure activity analysis, should be conducted in collaboration with Massport to better understand these effects. 1-19

Finally, it is important to fully and comprehensively understand the specific community-level impacts of pollutants from Logan Airport. While modelling is helpful in understanding the general amount of pollutants generated by the Airport, these models do little to inform us of exactly who is being impacted by these pollutants, or what the specific source of the pollution is. The only practical way to gain this knowledge is through physical monitoring of air pollution throughout the community. This is why Massport must engage in the installation of a network of air quality monitoring stations throughout the Airport host communities of East Boston and Winthrop. This air quality monitoring network should measure key pollutants in the neighborhood, providing this data real-time on publicly accessible apps to neighborhood residents to help them fully understand the relevant health impacts. The portfolio of pollutants measured should include, among others, ultrafine particulates. As an increasing body of knowledge points to the health risks of UFPs, preliminary studies conducted near Logan Airport have suggested high concentrations of UFPs as a result of Airport activity, making such monitoring essential. Furthermore, such a real-time monitoring network will provide a critical spatial and temporal lens to pollution data, which modelling cannot hope to accurately capture. This will give a better understanding of which parts of the community are being affected by which pollutants at what time, identify the specific sources of 1-20 1-20

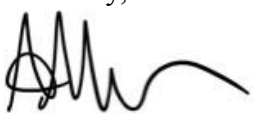
pollutants, and furthermore, help distinguish between pollutants caused by Logan Airport and those from other sources in the area. Such physical monitoring is an important counterpart to pollutant monitoring, and data collected from such should be a foundational aspect of future EDR reports. 1-20

I respectfully request that the Executive Office of Energy and Environmental Affairs require Massport to provide a detailed plan for mitigation of Airport related noise and air pollution and traffic impacts as part of their recovery plan in the wake of the coronavirus pandemic, with adequate preparation to anticipate the possibility of a swift return of pre-pandemic passenger numbers and growth rates. These preparations should include actionable items to promote HOV travel to and from Logan Airport, reduced nighttime operations, improved soundproofing and air purification efforts, more detailed examination of health impacts, and real-time physical air quality monitoring in host communities to more realistically understand pollution trends and impacts. Massport must continue to meet its mitigation implementation commitments to proactively address the future environmental effects of pre-pandemic levels of air traffic and to accurately alleviate conditions in already burdened environmental justice communities. 1-21

Thank you for the opportunity to comment on this matter. Although coronavirus-related declines in travel have led to a temporary reduction in operations from Logan Airport, and correspondingly a brief respite from their effects in host communities, we must be fully ready, as re-opening continues and recovery begins, to anticipate the return of these environmental burdens and to proactively mitigate against their worst effects. Prior to the pandemic, Massport EDR and ESPR models systematically underestimated growth and impact levels, leaving communities woefully underprepared to deal with the impacts. Now, as we enter a "new normal," we can better anticipate the conditions we will return to and begin to prepare and mitigate against them now.

We can and must make sure that post-pandemic conditions are improved for the residents of my district as well as other neighborhoods, cities, and towns surrounding Logan Airport. I am confident that the Executive Office of Energy and Environmental Affairs will recognize the importance of requiring these common-sense measures in this critical planning document. Please do not hesitate to contact me should you have any questions.

Sincerely,



Adrian C. Madaro
Representative
First Suffolk District

COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., SUITE 1020
BOSTON, MA 02114
Telephone: 617-626-7300
Facsimile: 617-727-0030

Charles D. Baker
Governor

Karyn E. Polito
Lt. Governor

Kathleen A. Theoharides
Secretary

Patrick Woodcock
Commissioner

11 March 2021

Kathleen Theoharides, Secretary
Executive Office of Energy & Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02114
Attn: MEPA Unit

RE: Boston-Logan International Airport, Environmental Status and Planning Report (ESPR), Boston, MA, EEA #3247

Cc: Maggie McCarey, Director of Energy Efficiency, Department of Energy Resource
Patrick Woodcock, Commissioner, Department of Energy Resources

Dear Secretary Theoharides:

We've reviewed the Environmental Data Report (EDR) for 2018/2019 (published December 2020) for Boston Logan International Airport. EDRs are produced annually to identify environmental impacts based on measured passenger activity and operations.

EDRs complement Environmental Status and Planning Reports (ESPRs), filed periodically, which provide both a data lookback, like an EDR, and a planning perspective looking forward. The DOER's most recent comments were concerning the ESPR published in 2019.

We are pleased to see that, in response to DOER's recommendation, these reports are continuing to track the following:

- GHG emissions in buildings, normalized by square foot (lbs CO2/sf-yr), and
- Energy use in buildings, normalized by square foot (kBtu/sf-yr)

The addition of these metrics will help provide important insights into the performance of Logan's buildings and help plan for the future.

Estimating Building Emissions in Context of CHP

Estimating building emissions from buildings which use only utility provided electric and gas is relatively straightforward. However, we understand that, in addition to utility provided electric and gas, Logan also uses central plant combined heat and power (CHP) to heat, cool, and power buildings. When CHP is used, the building emissions picture is more complex. 2-1

To assess this, as we've previously recommended[1], EDRs and ESPRs should also report the following:

- Space and water heating end use consumption should be estimated and broken down by heating which is provided by central plant steam versus heating provided by fossil-fuel fired (or other) equipment;
- Similarly, space cooling end use consumption should be estimated and broken down by cooling from central plant produced chilled water versus cooling provided by other non-CHP means; 2-2
- CHP heating and cooling production efficiency and power production efficiency should be estimated. 2-3

Once the above is estimated, the emissions of building space heating, space cooling, and service water heating can then be estimated. This analysis should be done using electric grid emissions of 658 lbs/MWhr (for year 2021) and 200 lbs/MWhr (for year 2050) to provide a picture of current and future emissions footprints. 2-4

Recommendations for New Construction and Renovations

When planning new construction and renovations, we recommend the following: 2-5

1. Prioritize building design and construction practices that result in low heating and cooling thermal energy demand intensity (heating and cooling "TEDI") by:
    - Maintaining envelope integrity with framed, insulated walls with continuous insulation;
    - Thermally-broken windows and other components to eliminate thermal bridges;
    - Minimizing glass curtain wall assemblies and excessive windows;
    - Low air-infiltration, confirmed with in-building air-infiltration testing;

[1] See DOER comment letter on the 2017 Environmental Status and Planning Report, dated November 2019

- Energy recovery;
- Management of solar heat gains;

2-5

2. If new or renovated residential or hotel space is planned, pursue Passivehouse (ether PHIUS or PHI certifications.)

3. Pursue efficient electrification of space heating, including air-to-air (or VRF) and air-to-water heat pumps. Avoid use of CHP and on-site gas combustion for space heating.

    - At current grid emission rates (658 lbs/MWhr), space heating provided by efficient electric heat pumps has about 17% less emissions than space heating provided by CHP. By 2050 when emission rates are at about 200 lbs/MWhr, space heating provided by efficient electric heat pumps will have about 60% less emissions than CHP. Accordingly, expansion of CHP use into new construction and renovations projects is not recommended.

    - At current grid emission rates, space heating provided with electric heat pumps has about 50% less emissions than on-site natural gas combustion. By 2050, electric heat pumps will have about 90% less emissions than gas.

4. Use efficient electrification of water heating wherever possible, including heat pump water heaters.

5. Set aside as much rooftop space for solar as possible, including for projects in which solar may not be built as part of initial project.

6. Prepare for ubiquitous electric vehicles with as much EV and EV ready parking spaces.

Sincerely,

Paul F. Ormond, P.E.
Energy Efficiency Engineer
Massachusetts Department of Energy Resources

Brendan Place
Clean Energy Engineer

Massachusetts Department of Energy Resources

COMMONWEALTH OF MASSACHUSETTS
TOWN OF MILTON
OFFICE OF SELECT BOARD
525 CANTON AVENUE, MILTON, MA 02186
Telephone: 617-898-4843
Fax: 617-698-6741

MICHAEL D. DENNEHY
TOWN ADMINISTRATOR

SELECT BOARD
MELINDA A. COLLINS
CHAIR
KATHLEEN M. CONLON
VICE CHAIR
ARTHUR J. DOYLE
SECRETARY
RICHARD G. WELLS, JR.
MEMBER
MICHAEL F. ZULLAS
MEMBER

March 12, 2021

The Honorable Kathleen A. Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
Attn: Massachusetts Environmental Policy Act ("MEPA") Office
Anne Canaday, EEA No. 3247
100 Cambridge Street, Suite 900
Boston, MA 02114

via EMAIL to env.internet@mass.gov and anne.canaday@mass.gov

Re: Comments of the Town of Milton on the Boston Logan International Airport 2018-2019 Environmental Data Report (2018-2019 EDR)

Dear Secretary Theoharides,

The Select Board of the Town of Milton ("Milton") is pleased to provide the following comments in response to the Boston Logan International Airport 2018-2019 Environmental Data Report (2018-2019 EDR).

We understand that this combined 2018-2019 EDR was prepared during the ongoing COVID-19 pandemic and includes updates through the fall of 2020. We note that the dramatic reduction in passengers and flight operations has provided some respite to the ongoing airplane noise and pollution issues experienced in Milton, but still no real solutions have been proposed to successfully insulate the on-the-ground impacts from increasing airplane overflights on the Logan Airport surrounding communities. We urge Massport and the FAA to use this period of respite to continue to consider the impacts noise and pollution has on your neighbors and customers. 3-1

1. Scope of the 2018-2019 EDR

Milton summarizes and repeats its comments on the 2017 ESPR concerning scope of Massport's review of environmental impacts, as we are specifically concerned about how the increased demand for airport services impacts the surrounding communities, including increasing the

volume and concentration of overflights, and increasing the amount of nighttime operations and nighttime overflights.

As is typical with these EDRs and the ESPR, the focus remains on environmental impact of operations at Logan, rather than around Logan. Failing to fully address off-airport impacts ignores the robust science that demonstrates that airport operations can impact communities as far as 10 miles beyond the airport location, particularly where those communities are overflown by multiple RNAVs and the aircraft traffic is concentrated and persistent.

2. Cumulative Impacts Analysis and PRAS

We repeat the need for an analysis of the cumulative impacts from increasing numbers of RNAVs flown over surrounding communities. As discussed in numerous other comment letters, there are three RNAVs that overfly Milton, with two others proposed. Looking at these impacts in isolation does not provide an actual assessment of on-the-ground impacts – some of which are reflected in the increasing number of noise complaints filed in these communities. Neither the EDRs, the ESPRs, nor the proposed rulemaking for the 4L RNAV approach appropriately analyzes cumulative impacts – and such analysis is required by law. 3-2

As defined in the FAA's own guidance (Order 1051.1F), cumulative impacts are those that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, whether Federal or non-Federal. The Massachusetts Environmental Protection Act (MEPA) also requires that projects be analyzed together, and segmentation to evade analysis of cumulative impacts is prohibited. While not directly applicable to the EDR analysis, the same theory applies -- when analyzing the environmental impacts of Massport operations, the off-premises operations must be analyzed in toto, and not evaluated in separate boxes. 3-3

When cumulative impacts are analyzed appropriately, then those impacts may be appropriately distributed among the impacted communities. This was the concept behind the Preferential Runway Advisory System (PRAS), which was unfortunately abandoned in 2012. PRAS was established "to provide an equitable distribution of Logan Airport's noise impacts on surrounding communities." The two primary objectives of the PRAS goals are: (1) to distribute noise on an annual basis; and (2) to provide short-term relief from continuous operations over the same neighborhoods at the ends of the runways. See EDR, page 6-19.

While no other guidelines are in place, Massport still reports runway usage with respect to the PRAS goals (Table 6-6). The PRAS goals offer at least some picture of what a fair distribution of aircraft traffic might look like using one particular tool, i.e. differential runways (being mindful that these PRAS goals were created well before RNAV concentrated flight routes were implemented). Thus, at this stage, only achieving balanced runway usage would not be sufficient to relieve those under the RNAVs, although it would be a step in the right direction.

Ultimately, a fair resolution of these ongoing noise issues in Milton will require further dispersion of the aircraft traffic from the concentrated RNAVs.

Milton continues to be ready to work on these equity issues, either via the MCAC, or directly with Massport and the EEA agencies. The 2018-2019 EDR's response to Milton's prior comments concerning equitable runway use, and a fair allocation of noise distribution, as set forth in section 7-2 to 7-4 of the Appendix is wholly insufficient. The response simply throws up its hands and shifts the burden of developing a procedure to the MCAC. As we all know, leaving it to the communities is unproductive, and pits neighbors against each other. We again request that the Secretary direct Massport and the EEA agencies, with the support of the MCAC, to promptly develop a system for the fair and equitable distribution of aircraft overflights that provides real relief to the highly impacted surrounding communities. 3-4

3. Evaluation and Updating of Noise Metric

We urged, and we repeat this request- Massport and the Secretary must move to a more updated method for noise assessment using currently available noise measurements (e.g., N70, which focuses on the number of noise events greater than 70 dB(A)[1] or Lmax[2]), and either discontinue using the DNL standard, or supplement its use with these additional metrics. The logarithmic nature of the DNL standard, which has been widely criticized, combined with the fact that this calculation is most often calculated on an annual basis "masks" the acute impacts a succession of aircraft flying over a home has on the sleeping residents within, and also masks the acute impacts felt in a community when it is overflown for hours on end, with little break in the incoming aircraft. Massport has the ability to calculate DNL on a much more frequent basis, and is supposed to be calculating this figure monthly but chooses not to do so. Calculating DNL across shorter time periods (e.g., monthly, weekly) would provide a more accurate indication of the suffering that Milton residents are enduring as a result of concentrated flightpaths and long hours of overuse, and would compel Massport to act to reduce airplane noise in Milton and other communities. 3-5

Massport's responses to Milton's comments from the 2017 ESPR are not encouraging. It simply notes, vaguely, that Massport uses a variety of noise metrics and measurements. This is not enough. There is significant evidence that the DNL significantly under-measures noise and annoyance. FAA has recognized this in the 1050.1F guidelines, and suggests that DNL can be supplemented. The guidance states:

> DNL analysis may optionally be supplemented on a case-by-case basis to characterize specific noise impacts. Because of the diversity of situations, the

[1]https://www.infrastructure.gov.au/aviation/environmental/airport_safeguarding/nasf/files/1.3_Guideline_A_attachment1.pdf

[2] The Lmax measurement measures "maximum sound level" during a single event. This measurement is successfully used by the Federal Highway Administration (FHA), a DOT agency just like FAA.

variety of supplemental metrics available, and the limitations of individual supplemental metrics, the FICON report concluded that the use of supplemental metrics to analyze noise should remain at the discretion of individual agencies.

In comments we are also submitting this month on the Neighborhood Environmental Survey (NES), we make a similar point. DNL under-measures noise and annoyance, because it dilutes measurement of noise annoyance during in-use runway days by inclusion of days not in-use, and it fails to take into account the noise disturbance contribution of peak-time continual short-interval overflight aircraft separation. Supplemental metrics (which already exist) lower the measurement threshold for particular hours (like overnight), or take into account the short interval between noise events, are necessary to make the noise and sound measurement real and useful, in working with impacted overflight communities. We urge the Secretary to require Massport to update its measurements to use these supplemental metrics, when evaluating the impacts of airplane noise on the communities surrounding Logan. 3-6

4. Collaboration

We continue to urge real and substantive collaboration between Massport, the Secretary, and the communities impacted by Logan overflights. Multiple communities surrounding Logan (not just Milton) take the brunt of the impact of the operations of Logan, and the situation has worsened substantially since the FAA implemented NextGen. While, as noted above, the pandemic has lessened these impacts, the respite is temporary and now is the time to build better communications and collaboration for a region-wide approach to overflight noise, annoyance, and pollution. Direct and regular access to Massport and the Secretary/all EEA agencies may help develop real and meaningful solutions to address the problems from airport operations – especially noise and pollution -- occurring in those communities. While we understand some of that work must be done via the Massport Community Advisory Committee ("MCAC"), the large size and the organization of the MCAC has the unintentional effect of diluting the voices of the most affected communities. With respect to the MIT study, four years after it began, Milton's requests for specific analysis and relief through that study remains incomplete. 3-7 3-7

3. Increased Noise Complaints Reported

Table 6-16 demonstrates that no single community made as many complaints on the Noise Complaint Line as Milton, although the numbers for other communities are catching up. Overall, and in Milton, both the number of complaints and the number of callers continues to increase. Table 6-16 reports a total increase in calls from Milton in 2018 - 10,962 and total a further increase in calls in 2019 - 6,673. Total calls in 2018 were 34,902, and in 2019 were 41,575. For reference, the 2014 EDR reported 2,669 complaints and 4,991were reported in the 2015 EDR. That represents over a 1000% increase in the number of complaints filed. Overall, Massport reports more than a 400% increase in the number of individual complainers on the noise complaint line, from 2017 to 2019 in all 15 reported overflown communities. Complaints

on the Massport complaint line from Milton have continued to increase since 2012, coinciding with and increasing as the use of performance-based navigation at Logan has been implemented.

The 2018-2019 EDR continues to ignore the importance of noise annoyance as a factor of environmental impact and harm. Noise annoyance in the Logan overflight communities -- which includes lack of sleep, disrupted and interrupted sleep, interrupted conversation, and impacts on use of outside spaces such as decks and yards, playgrounds, and civic spaces – is growing. This noise annoyance is not simple NIMBYism, it is a public health issue, as further discussed below. 3-8

These are real impacts, suffered by real people, who live in nearby communities. It is outrageous that Massport virtually ignores these complaints in the 2018-2019 EDR, and still has no plan in place to address impacts on these citizens. The noise from Logan operations impacts citizens across boundaries, yet no one community is empowered to find a solution. Instead, we must turn to our leaders at the state level, including the EOEEA for oversight, empowerment, and solutions. 3-8

4. Increased Nighttime Operations

Nighttime operations at Logan – defined as from 10:00 P.M. to 7:00 A.M. – continue to increase steadily. Nighttime operations increased by 15% from 2016 to 2017 increased again, by another 5.1% from 2018-2019 (Table 6-4). Total nighttime operations have more than doubled since 1990.

Although the noise complaint data is not broken down by time of day (either that the complaint was filed, or that the complaint concerned), it follows that some portion of the increase in complaints in Milton and other communities is driven by increased nighttime operations. Data continues to be developed which indicates airplane noise in overflown communities disrupts sleep patterns, which has been shown to result in adverse human health impacts.

Information from Milton residents indicate that the noise from airplanes in Milton is clearly heard above background noise in both commercial and residential areas. As elected officials, we hear frequently from Milton residents who suffer from interrupted sleep, anxiety and a reduced quality of life because of the noise pollution caused by very frequent – and some days continuous – flights over Milton at low altitudes. Indeed, this is one of the two most common requests for relief we receive from residents. We cannot overstate the seriousness of the health problems that these RNAVs cumulatively pose for Milton residents, and the adverse cumulative environmental impact that the RNAVs and the low flying planes have on our entire community. The noise from airplane overflights can also negatively impact property values. Fewer buyers are willing to purchase a home in an area with known noise impacts, and prices can be suppressed. Meanwhile, recent buyers have been vocal on social media that they would not have purchased a home in Milton had they been aware of the amount of airplane noise in the town.

We repeat the request we made in our comments to the 2017 ESPR, which were not sufficiently addressed in Appendix 7 to the 2018-2019 EDR, that the Secretary work with the FAA, 3-9

Massport, and Milton to implement late night aircraft restrictions, similar to those set forth in 740 CMR 24.04, which are protective of Milton and its residents. In particular, it is important to discuss restrictions on RNAV usage and routes that overfly residential neighborhoods, including spreading the routes further so that the nighttime noise is less concentrated in residential neighborhoods, or moving routes over the ocean during certain periods of time. Specifically, as there are already nighttime restrictions on arrivals to runway 4L, we request the same restrictions (no arrivals between 11:00 PM and 6:00 AM) for runway 4R. See Massachusetts Port Authority Noise Rules and Regulations I.1(b), Summary of Runway Use Restrictions, Boston Logan International Airport (May 2, 2016) (also referenced in FAA BOS ATCT Noise Abatement Order 7040.1H). In addition, early-morning departures from runway 27 also routinely overfly Milton and the other communities under the runway 27 RNAV. 3-9 3-10 3-10

5. Air Pollution and Public Health.

Once again the 2018-2019 EDR only discusses air pollution from airport operations in the context of the actual operations of Logan airport, on Logan property. We repeat our comments to the 2014 and 2015 EDRs, and the 2017 ESPR, that this perspective is overly and conveniently narrow. Recent studies at LAX (Hudda, et al., May 2014) found ultrafine particle (UFP) counts as far as ten miles from heavily used arrival runways. Although study of the negative effects of UFPs are ongoing, UFPs are believed to have negative effects on respiratory and cardiovascular health in humans, and Massport does not dispute that UFP pollution is an issue at Logan[3]. We are disappointed that the 2018-2019 EDR did not consider the developed science on this important environmental impact to the citizens living in the Logan overflight area. The health of our residents, employees, and visitors depends upon policy and operational procedures that takes this data into account. 3-11

We repeat the request we made in our comments to the 2017 ESPR, which were not sufficiently addressed in Appendix 7 to the 2018-2019 EDR, that the Secretary direct Massport, in conjunction with the Department of Public Health ("DPH") and the Department of Environmental Protection ("DEP"), to conduct noise and air pollution studies in communities like Milton which receive a substantial number of low-flying arrival aircraft. This work would be consistent with the evolving science on this point, and protective of the residents in these communities. We further request that the scope of the future EDRs be expanded to consider the health impacts from increased and concentrated arrival and departure operations due to RNAVs, and that pollution data be measured for every community under any of the many Logan RNAVs, and that no new RNAV overflight paths be put into use until such study is complete and all parties agree that no additional detrimental effects will be experienced by residents in communities bearing the brunt of low-flying airplane overflight. 3-12 3-13

7. Conclusion and Request for Assistance.

[3] https://www.wgbh.org/news/local-news/2019/09/24/air-pollution-from-logan-airport-harms-surrounding-communities-research-shows

Thank you for your attention to and consideration of our comments on the 2017 ESPR. We believe that there can be solutions available to remedy and mitigate the ongoing impact of Logan operations on the residents of Milton. We request that the Secretary work with Massport, Milton, the MCAC, and other affected communities to help remedy the multiple impacts discussed above. Specifically, the requests made are as follows:

a. Direct Massport to prepare a Supplemental EDR which fully and realistically addresses projected increases to Logan operations and airport throughput, and the resulting environmental impacts; 3-14
b. Work with the FAA, Massport, and Milton to develop and implement late-night aircraft overflight restrictions which are protective of Milton and its residents, including consideration of an 11:00 PM to 6:00 AM landing prohibition on runway 4R; 3-15
c. Direct Massport and the MCAC to promptly develop a system for the fair and equitable distribution of aircraft overflights that provides real relief to the highly impacted surrounding communities, especially those that are under multiple RNAVs; 3-16
d. Direct Massport to collaborate with DPH and DEP to develop and conduct noise and air pollution studies in highly impacted surrounding communities, especially those that are under multiple RNAVs; 3-17
e. Direct Massport to include all of the points made above in the scope of the 2018-2019 EDR and in all future EDRs. This includes impacts to health from noise and pollution from: off-airport impacts of growth, cumulative impacts of RNAV overflights, increased nighttime operations, moving to updated noise measurements which are more protective of human health and which account for acute impacts more realistically than the DNL standard; and working directly with impacted communities to more fully understand and evaluate the human health effects from Logan operations. 3-18
f. Direct Massport to utilize supplement metrics when measuring sound and annoyance from airplane overflights in Milton and all other communities. 3-19

We would appreciate a time to meet with you and your staff to personally discuss the concerns we have outlined here, as well as our specific requests for assistance.

Sincerely,

Melinda A. Collins, Chair

Kathleen M. Conlon, Vice Chair

Arthur J. Doyle, Secretary

Richard G. Wells, Jr.

Michael F. Zullas

Milton Select Board

cc: Representative Stephen F. Lynch
Representative Ayanna Pressley
U.S. Senator Elizabeth A. Warren
U.S. Senator Edward J. Markey
State Senator Walter F. Timilty
State Representative William Driscoll
State Representative Brandy Fluker Oakley
Milton Board of Health
Milton Airplane Noise Advisory Committee Chair Andrew Schmidt
MCAC Representative Thomas Dougherty
Town Counsel Karis North

clf
conservation law foundation

For a thriving New England

CLF Massachusetts
62 Summer Street
Boston MA 02110
P: 617.350.0990
F: 617.350.4030
www.clf.org

March 12, 2021

Via Electronic Mail and Online Portal

The Honorable Kathleen Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
Attention Anne Canaday
100 Cambridge Street, Suite 900
Boston, MA 02114

Subject: EEA #3247: Boston Logan International Airport 2018/2019 Environmental Data Report

Dear Secretary Theoharides:

On behalf of the Conservation Law Foundation (CLF) and its members,[1] I am providing our comments regarding Massachusetts Port Authority's (Massport) Boston Logan International Airport 2018/2019 Environmental Data Report (EDR).

Preliminary Statement

The 2018/2019 EDR provides a historical review of environmental conditions for the given reporting years and describes Massport's progress on its environmental mitigation commitments. Flight activity and passenger volumes rose during the reporting years, exceeding the modeled growth rates. Given that growth is a primary driver of public health and environmental impact, and consequently will determine the scale of Massport's obligations and opportunities to avoid, minimize, and mitigate environmental harm, CLF recommends that the Secretary's Certificate clarify reporting requirements, require additional air mitigation, specify transparent thresholds for deferred mitigation projects, and direct additional community engagement. 4-1

While overall airport operations have decreased as a result the pandemic, communities near Logan Airport have been disproportionately affected by COVID-19[2] and are uniquely vulnerable

[1] CLF is a nonprofit, member-supported, regional environmental organization working to conserve natural resources, protect public health, and promote thriving communities for all in the New England region. CLF protects New England's environment for the benefit of all people. We use the law, science and the market to create solutions that preserve our natural resources, build healthy communities, and sustain a vibrant economy. We are working to cut pollution from our cars and trucks, create alternatives to driving, and push for more affordable and equitable transportation options across New England.

[2] East Boston has some of the highest COVID-19 positivity rates relative to other Boston neighborhoods. Boston Public Health Commission (2021). Accessed 15 February 2021 at https://www.bphc.org/onlinenewsroom/Blog/Lists/Posts/Post.aspx?ID=1282.

to its health risks. Similarly, public health studies document strong links between air pollution and COVID-19 health risk.[3] Given these risks, it is critical that Massport continsue its mitigation projects and provide clear thresholds for any deferrals, engage with residents and organizations from affected communities, and provide transparent and clear reporting of environmental impacts. 4-2

Massport expects that it will be years before operations return to pre-COVID-19 levels. While we applaud Massport for following through on several important commitments despite these uncertain conditions, environmental mitigation is critical during this unprecedented public health crisis. CLF encourages Massport to be more exacting in its activities and transparent in its decision making. As such, CLF offers the following comments regarding the 2018/2019 EDR. 4-3

Detailed Comments

CLF and Massport share and have worked collaboratively to achieve the goal of reducing overall environmental, emissions, and traffic impacts resulting from Logan Airport operations. CLF offers these comments regarding Massport's ongoing and planned initiatives to minimize and mitigate public health and environmental impacts as presented in the 2018/2019 EDR. We also reference the Executive Office of Energy and Environmental Affairs (EEA) certificate of the 2017 Environmental Status and Planning Report (ESPR) and the requests EEA poses to Massport in this document (ESPR Certificate). We note the importance of mitigation and a rigorous MEPA review process to best adjust to the current reality of the COVID-19 pandemic.

A. We recommend that Massport clarify and refine its process for estimating growth rates and provide additional data. 4-4

The Secretary's Certificate on the ESPR indicates that the 2018/19 EDR "must include information on the environmental policies and planning that form the context of environmental reporting, technical studies, and environmental mitigation initiatives against which projects at Logan Airport can be evaluated" and include cumulative impacts of Logan Airport operations and activities.[4] The Secretary recommended that Massport work with the East Boston Health center to provide HEPA room air purifier filters to high risk individuals and to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts.[5] It further required the 2018/19 EDR to include "commitments from Massport for the reduction and mitigation of these [ultrafine particulates] impacts."[6]

Chelsea, Revere, and Everett have some of the highest COVID-19 positivity rates in the state, relative to other municipalities. Commonwealth of Massachusetts (2021). COVID-19 Interactive Data Dashboard. Accessed 16 February 2021 at https://www.mass.gov/info-details/covid-19-response-reporting

[3] Wu, X., Nethery, R.C., Sabath, M.B., Braun, D. and Dominici, F., 2020. Air pollution and COVID-19 mortality in the United States: Strengths and limitations of an ecological regression analysis. Science Advances, 6(45), p.eabd4049.

[4] Certificate of the Secretary of Energy and Environmental Affairs on the 2017 Logan Airport Environmental Status and Planning Report, MEPA Certificate 3247, page 4 (Nov. 25, 2019).

[5] *Id.* at 18.

[6] *Id.*

Massport should clarify the discrepancies between the 2018/2019 EDR and forecasted growth rates included in the 2017 ESPR. While activities and operations have decreased after the reporting years, Massport should describe its planned methodology for future forecasting, especially as it has deferred mitigation projects because of reduced activity and operations. Massport must first avoid, minimize, and then mitigate damage to the environment that occur as a result of activities at Logan Airport.[7] Massport's process for measuring impacts and devising appropriate mitigation activities must be robust to meet situational uncertainties. For Massport to adequately mitigate its impacts, it must have data collection and review processes that accurately measure and understand its impact. 4-5 4-6

Even prior to the COVID-19 crisis, Massport's characterizations of environmental impact were based on a flawed forecasting process for both operations and passenger activity. As CLF has previously noted, the forecasting process in the 2017 ESPR was inconsistently represented, historically inaccurate, and did not match the qualitative descriptions of key growth drivers within the ESPR. CLF also notes that the passenger compound average growth rate represented in the 2017 ESPR of 1.5 percent[8] has largely been exceeded by the passenger count included in the 2018/2019 EDR. Specifically, the EDR estimates that in 2019, passenger activity levels reached 42.5 million,[9] which represents a 5.2 percent annual growth rate from the 2017 estimate of 38.4 million.[10]

Given this discrepancy, Massport should describe its basis and methodology for future forecasting, which will be critical to deciding the scope of future mitigation. This prior forecasting resulted in flawed and inaccurate estimates. This is concerning because Massport will need to accurately measure how activities and associated environmental impacts change as the pandemic continues and through subsequent recovery. In the EDR, Massport notes that "…the 2017 ESPR projections will need to be adjusted as the longer-term impacts of the COVID-19 pandemic are better understood."[11] The EDR does not outline a process or timeline for when these projections will be adjusted, how the adjusted projections relate to mitigation efforts (see section below), and how the methodology will differ from what was presented in the 2017 ESPR. Massport has deferred several mitigation projects, and it is unclear under which activity, operations, or environmental impact scenario that these deferrals will be revisited. 4-7 4-8

CLF also recommends that Massport review assumptions that no longer hold true because of the pandemic, especially those that may increase environmental impacts on a unit basis. While the pandemic has reduced operations, impacts on a per-unit basis have potentially shifted. In its 2017 ESPR, Massport noted that airline operations have historically grown at a slower rate than passenger activities.[12] Notwithstanding, in the 2018/2019 EDR, Massport notes that cargo volumes in large airports around the country have "have seen more mild declines or, in a few 4-9

[7] M.G.L. c. 30, § 61.
[8] ESPR 2017, p. 2-36.
[9] EDR 2018/2019, p. 1-10
[10] Calculated.
[11] EDR 2018/2019, p. 1-12.
[12] ESPR 2017, p. 1-7.

cases, significant growth."[13] Similarly, airlines are operating planes with fewer passengers. Even as passenger counts decrease, they may not have the same relationship to operations. Regarding vehicle miles traveled (VMT) and ground transportation as Massport notes, "the public's interest in using HOV transportation services like buses, rapid transit, and commuter rail has been significantly affected by public health concerns related to COVID-19."[14] The average impact on a per passenger basis then is higher, even as base passenger activities have decreased.

We also echo the concerns of other stakeholders that basing measures of impact (noise, air quality, VMT, etc.) on inaccurate activity forecasts is problematic. We recommend that Massport provide a list of all measured impacts, how said impacts are methodologically related to the activity levels presented in the ESPR forecast, and how current and forward-looking data can be used instead in both the MEPA reporting process, and in other public engagement forums. We encourage Massport to work with community stakeholders to create a mitigation planning system which is based on actual passenger, flight, and daily traffic volumes. 4-10 4-11

To that end, Massport should more thoroughly document public health impacts. Massport should provide a more detailed update on the Tufts and Boston University Ultrafine Particulate (UFP) study and associated findings. EEA notes that the EDR should "provide an update on the status and finding of UFP research being performed by Tufts University and Boston University regarding the identification of airport-specific related UFPs in an urban environment."[15] The 2018/2019 EDR notes Massport's cooperation and data sharing with the study but does not provide additional detail on study findings or relevance to Massport activities. 4-12 4-13

Massport should provide additional detail on any activities or research regarding the connection between heat and air quality issues. The City of Boston estimates that Boston's average summer temperatures and the number of days with extreme heat will increase.[16] Boston and other urban areas are prone to urban heat island effect, which results from the retention of heat by building materials, versus vegetation. By 2030, Boston will see 20-40 days above 90 degrees with similar effects for communities around the greater urban area.[17] Extreme heat increases the concentration of ozone and particulate matter in the air, which can have detrimental effects on those with respiratory conditions. [18] The ESPR Certificate acknowledges the connection between extreme heat, respiratory illness and public health and encourages "Massport to consider its ability to reduce negative air quality effects as a matter of public health, and to work with community-based organizations to collaboratively determine how to further mitigate air 4-14

[13] EDR 2018/2019, p. 2-23.
[14] EDR 2018/2019, p. 1-17.
[15] 2017 ESPR Certificate, p. 18.
[16]City of Boston. 12/2016. Climate Projection Consensus. Accessed 18 November 2019 at https://www.boston.gov/sites/default/files/03_climate_ready_boston_digital_climateprojectionconsensus.pdf, p. 5
[17] City of Boston. 12/2016. Climate Ready Boston. Accessed 2 October 2019 at https://www.boston.gov/departments/environment/climate-ready-boston
[18]Massachusetts Department of Public Health - Bureau of Environmental Health. https://matracking.ehs.state.ma.us/Climate-Change/climate_and_health_profile.html

quality impacts."[19] CLF supports the Secretary's directive in the ESPR Certificate to work with community stakeholders to determine appropriate and effective mitigation.

B. Additional mitigation is required commensurate with growth in the reporting years to minimize impacts to local communities. 4-15

C. There should be transparent thresholds for deferred mitigation projects. 4-16

There are several projects that initiatives that Massport has deferred due to reduced activities and operations. We list these in the table below. We recommend that Massport develop transparent thresholds of the appropriate metric (e.g., VMT, operations, passenger activity, etc.) for when Massport will return to the implementation of these projects, or at least clarify decision-making processes for returning to these mitigation measures. The 2018/2019 EDR notes that these projects will need to be re-evaluated but the decision-making processes that indicate when and under what conditions Massport will conduct this re-evaluation in unclear. In some cases, Massport notes that they will begin the project once passenger activities reach 2019 levels. CLF recommends that the Secretary's 2018/19 Certificate establish thresholds for Massport to recommence deferred mitigation projects. 4-16

Table 1 – Key Deferred Mitigation Projects

Project Category	Mitigation Activity	Environmental Impact	Referenced Page Number - 2018/2019 EDR
Suburban Logan Express Enhancement	Add about 1,000 additional spaces to the Framingham garage (deferred due to COVID-19).	Added HOV share, reduced VMT.	p. 1-8
Suburban Logan Express Enhancement	Provide security line priority status to Logan Express Back Bay riders (implemented in 2019; however, service is suspended as a result of COVID-19)	Added HOV share, reduced VMT.	p. 1-8
Suburban Logan Express Enhancement	Evaluate new Logan Express suburban locations, with a plan to open at least one new site (deferred due to COVID-19).	Added HOV share, reduced VMT.	p. 1-8
Urban Logan Express Service	Implement a second urban Logan Express service at North Station (although Massport procured buses for this service in 2020, due to COVID-19, this new service has been deferred).	Added HOV share, reduced VMT.	p. 1-19
Airport Ground Transportation and Parking Projects/Planning Concepts	Logan Airport Parking Project (additional 5,000 spaces)	Reduced VMT.	p. 3-13
Airport Ground Transportation and Parking Projects/Planning Concepts	On-Airport Roadway Congestion Relief Infrastructure (studies currently deferred)	Reduced emissions from idling.	p. 3-14

[19] 2017 ESPR Certificate, p. 9.

Airport Ground Transportation and Parking Projects/Planning Concepts	Terminal E Modernization (incorporates former West Concourse Project) - Blue Line Pedestrian Connection	Added HOV share through pedestrian connectivity.	p. 3-17
Other	Proceed with environmental review and seek funding for construction of People Mover system.	Added HOV share through intermodal transit, infrastructure improvements, reduced VMT.	p. 9-18

D. Massport should continue to engage with affected communities to discuss mitigation opportunities. 4-17

The 2018/2019 EDR reports on mitigation commitments and environmental impacts within the reporting period. In this EDR review process, Massport produces these documents internally, and then releases them to the public for comment and input after they are already complete. Given the rapid changes that have followed from the pandemic, an annual public review process where public input is only provided after Massport releases a document is insufficient for proper mitigation planning, especially as Massport is making decisions about mitigation projects and operations as the external pandemic situation shifts. Instead, Massport should work with organizations and members from most affected communities prior to the release of the next iteration of the report. This will allow Massport to conduct more thoughtful planning as operations and impacts shift. 4-18

State law and policies require enhanced engagement with residents of environmental justice communities.[20] To that end, CLF encourages Massport to hold community meetings, outside of MEPA processes and after MEPA deadlines expire, to discuss ways for Massport to be a great neighbor and best implement mitigation measures associated with its environmental impacts, which are especially important during this major public health crisis. 4-19

E. CLF seeks additional detail in the ESPR regarding ground transportation to conform with the Massport-CLF agreement. 4-20

Pursuant to the Massport-CLF agreement, Massport agreed to undertake a comprehensive program to reduce ground transportation impacts by encouraging HOV mode transportation to and from the airport. Regarding employee transit, Massport agreed to establish a program to offer its 18,000 Logan Airport based employees effectively free (net of employer subsidies) Massachusetts Bay Transportation Authority (MBTA) Blue Line service from Airport Station by January 2019 to assist lower-wage workers in environmental justice populations.[21] This program would serve larger goals of transit and environmental justice. Language about this agreement was absent from the ESPR and the 2018/2019 EDR. Massport provides shuttle bus service for

[20] Executive Order 552 (2014); Massachusetts Environmental Justice Policy (2017).
[21] Massport-CLF Agreement (May 18, 2017).

passengers and employees between the Blue Line Airport Station and all terminals, [22] while also supporting the Sunrise Shuttle, which provides early morning bus service for employees in East Boston and parts of Winthrop and Revere.[23] However, these services are not equivalent to free MBTA Blue Line service for employees. As this was a component of the Massport-CLF agreement, Massport should explicitly include the free Blue Line service program for employees in the 2018/2019 EDR. Massport includes its response to CLF's previous comment on this issue and alludes to the changing circumstances regarding employee commuting and HOV use but does not specifically address the issue.[24] Regarding Logan Express service, Massport also agreed to increase its Logan Express service capacity by 10 percent by the end of 2019.[25] While some service is currently suspended Massport should transparently communicate its decision-making on restoring service within the 2019/2019 EDR.

4-20

In addition to its HOV commitments, Massport has committed to improvements that would improve air quality and reduce pollution including the replacement of gas- and diesel-powered ground service equipment (GSE) with electric equivalents by 2027.[26] CLF continues to encourage and support Massport's efforts in reducing emissions from its GSE, and in its GHG-reduction initiatives and investments in renewable energy and applauds Massport for moving forward with these improvements. CLF also supports Massport's completed additions of new electric vehicle charging stations and the progress made since the release of the 2017 ESPR.[27]

CLF is happy to provide additional information and assistance as may be required. You may contact me with questions at SRubin@clf.org and 617-850-1781.

Sincerely,

Staci Rubin
Senior Attorney

Cc: Stuart Dalzell, sdalzell@massport.com
Brad Washburn, bwashburn@massport.com

[22] *Id.*
[23] ESPR 2017, Table 5-6, p. 5-28.
[24] 2018/2019 EDR, B-232.
[25] Massport-CLF Agreement (May 18, 2017).
[26] ESPR 2017, p. 7-1.
[27] 2018/2019 EDR, p. 3-35.

This Page Intentionally Left Blank.

March 12, 2021

The Honorable Kathleen A. Theoharides,
Secretary Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
100 Cambridge Street, Suite 900,
Boston, Massachusetts 02114

Re: Logan Airport 2018 / 2019 Environmental Data Report (EDR) EEA# 3247

Dear Secretary Theoharides,
Airport Impact Relief, Incorporated (AIR, Inc.) thanks you for the opportunity to comment on the Massport 2018 / 2019 EDR. AIR, Inc. supports the MEPA process by organizing monthly meetings, analyzing Massport's updates in consultation with our members and experts in related fields, and conducting community engagement to assure public participation.

This year's review comes at a pivotal moment as we come to terms with a set of unravelling truths about the long term growth of air travel demand and the environmental and public health costs of operating a large airport in the center of a major metropolitan area. In this year's EDR AIR, Inc. was expecting a number of especially key updates to be carried forward from the ESPR 2017 iteration of Logan's unique MEPA review process:

- the relevant scientific research on health impacts of aviation noise and pollution
- additional strategies to keep mitigation on pace with growth
- strategies for the most effective distribution of air filtration units

At the outset of our comments, we would like to take a moment tonote that we are very supportive of MEPA's recent requirement that all electronic submittals over 50 pages include bookmarks or an electronic table of contents that provides direct links to each of the sections and appendices. With the 891 page length of this EDR and the disjointed nature of the presentation of data, a searchability feature would be extremely welcome.

Relevant Health Research

Included in this EDR for the first time is information about research into the health impacts of aviation. AIR, Inc. was ultimately not consulted about the selection and discussion of research included, but even this first step provides MEPA with ample evidence of the need to continue its relative activism in envisioning further, more responsive policies and more collaboration. Later in our comments we will provide further discussion of Massport's health research reporting.

Additional Mitigation

Citing current reduced impact levels resulting from the temporary decline in passengers and flights due to the COVID-19 pandemic, Massport does not respond to MEPA's request to provide additional mitigation. Our comments below will provide further discussion of mitigation strategies.

Air Filtration Strategy

With the health center's continuing financial ties to Massport as the airport's medical first responder dating back to its inception, and Massport's funding of asthma identification and treatment, Massport has better access to East Boston Neighborhood Health Center (EBNHC) leadership and staff than we do. With early comments by Massport and EBNHC staff suggesting that key asthma staff at the health center questioned the effectiveness of plug-in air filtration systems, AIR, Inc. repeatedly asked to meet with both of them with the express purpose of assuring they had the latest information and policy guides about the effectiveness of this specific strategy. Citing the demands upon their staff due to pandemic response, Massport and the Health Center declined to meet with us. They did, however meet together, and we have subsequently learned that the health center has recommended against use of plug-in air filtration strategies citing questions about their efficacy in mitigation strategies.

We ask you to require that Massport make any recommendations on the topic of the efficacy of plug-in HEPA air filtration available to the public. 5-1

Adequacy of compliance to MEPA

In the certificate for Massport's 2017 ESPR, Secretary Theoharides included numerous directives most of which were conditional upon whether airport flight and passenger volumes continued to outpace Massport's 2017 ESPR growth projections, including that:

1. Mitigation should be commensurate with growth
2. Additional mitigation should be included in this EDR to address continued outsized growth
3. The EDR should list and provide discussion of relevant research on health impacts of aviation
4. Massport should collaborate with community stakeholders
5. Massport should consult with school nurses and the local health center on strategies to most effectively distribute air purifiers
6. Transportation mitigation planning must consider impacts in neighboring communities

With flight activity up 6.3% and passenger volumes rising 10.5% during this reporting period, each more than tripling the forecasted rates, the outpacing condition has been exceeded. The EDR reports these increases and across the board increases in impacts, but does not embrace or adequately address the additional mitigation required by the Secretary. 5-2

In an unanswered follow-up letter to Massport on 12/14/2020, after our first joint discussion on the EDR in November 2020, AIR, Inc. offered *the following initial suggestions which we now ask MEPA to consider*:

1. *Normalize collaboration* through regular meetings with community, perhaps on an every 3 months schedule as part of a MEPA Special Review Process (SRP) 5-3

2. *Growth-triggered mitigation strategies*. Mitigation developed through this SRP should be based on actual passenger, flight, and traffic volumes to address the risk of impact backlogs seen in the present retrospective reporting system. This approach would allow Massport to implement programs over time as travel volumes and airport revenues recover 5-4

The Global Pandemic

Massport reports that sharply reduced flight and passenger levels due to the pandemic have reduced environmental impacts. Considering that these drops have slashed Massport's revenues and staffing capacities, they have placed many projects and programs on hold.

ALL BOSTON TESTING DATA - CUMULATIVE COMMUNITY POSITIVITY

The "Cumulative Community Positivity" calculation counts each individual person one time (their first negative, their first positive), regardless of the number of times an individual is tested, to assess the level of COVID-19 infection in the City and neighborhoods since the start of the pandemic. College ordered testing included. (As of February 14, 2021. ***The next update will be 02-24-2021.***

NEIGHBORHOOD	NUMBER TESTED	OF TESTED, CUMULATIVE % POSITIVE	TESTING RATE PER 100,000 RESIDENTS
East Boston - 02128	35,022	18.9%	74,630.8
Dorchester - 02122, 02124	46,716	17.3%	57,759.6
Hyde Park - 02136	22,218	16.9%	64,921.3
Dorchester - 02121, 02125	42,872	16.3%	66,698.8
Mattapan - 02126	15,119	15.2%	51,093.2
Roslindale - 02131	21,185	13.7%	62,731.3

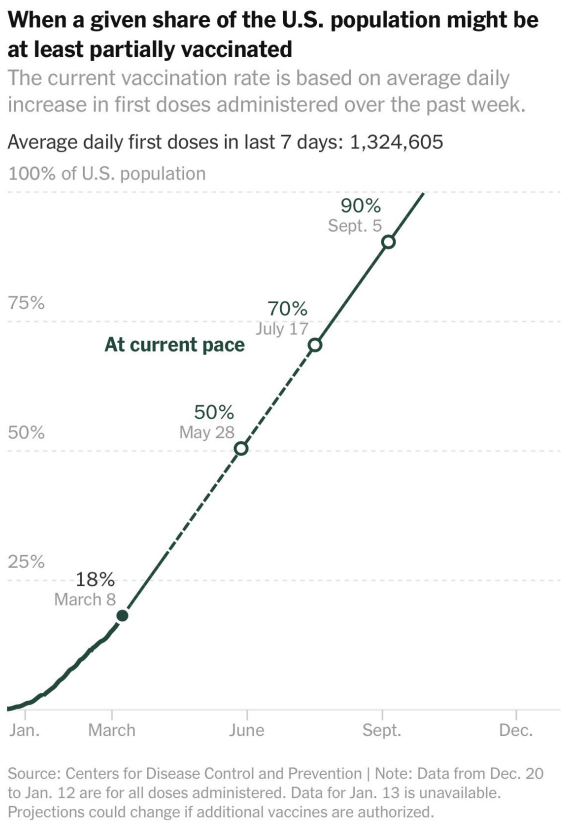
Although passenger load factors have increased over the last 20 years, because of the effects of the pandemic, resulting in fewer passengers per flight and travelers' avoidance of HOV modes, per-passenger impacts are increasing and it is likely that peak impacts are on track to return ahead of peak flight and passenger volumes. MEPA should be concerned with the lack of policy and mitigation of the potential near term impacts of this decline in load factors, in the EDR.

Massport reports that pandemic-related losses in activity are likely to follow a recovery curve which resembles previous downturns' recoveries. But, a number of factors suggest a faster return. One year into the pandemic, in late December 2020, Forbes magazine reported that *'for the strong majority of the traveling public, Covid-19 will cease to be a factor in travel plans by the end of 2021'*. Forbes predicts that with the U.S. national savings rate at a 45-year high, and pent up demand for air travel, a full recovery of US air travel is possible by the end of 2022.

Writing about China's air travel markets, Apex Aero, self-described as one of the world's largest international airline associations in a November 2020 article listed factors which they say contributed to 'a remarkable recovery', in Chinese air travel including:

1. Success in suppressing the virus
2. Latent demand

3. Mask-wearing culture, widespread temperature checking, and QR code tracking and tracing technology
4. Price discounting



The EDR suggests that several more years of downturn may lie ahead. But with evidence of faster than anticipated recoveries elsewhere and US vaccination rates already at 18% (21% in Massachusetts) and reported by the New York Times this week, to be on track for 60% of the US population, enough to develop a degree of herd immunity, to be vaccinated by May 2021, air travel could rebound *faster* than predicted. Tabling mitigation planning until peak volumes return again asks MEPA and impacted communities to rely on unfounded forecasts which have proved to be gross underestimates of actual demand in the past. 5-5

Growth-triggered mitigation planning would reduce this risk and satisfy MEPA's ESPR requirements.

Activity Levels

Actual flight operation and passenger levels at Logan averaged 3.15% over the 2018 and 2019 reporting period. This is nearly triple the ESPR forecast of 1.1% growth. Actual passenger volumes averaged 5.25% during the same period, 3.5 times the forecasted annual growth rate of 1.5%.

Even over this brief two year period, forecasting error has had a direct negative bearing on environmental outcomes in impacted communities. At the forecasted rate, Logan would have had 1.16 million more passengers in 2019 than in 2017. But 4.15 million additional passengers came, adding 3 million more passengers to the 9 million passenger backlog observed in Massport's previous MEPA filing.

To keep pace with the strength of demand for air travel seen in Boston, policy and mitigation efforts must be scaled accordingly. Continuing the example of this EDR's reported 3 million passenger overgrowth: with 40% of passengers choosing high occupancy vehicle (HOV) ground access modes, the mode choice breakdown of 3 million unplanned passengers would result in 1.8 million more single occupancy vehicle (SOV) trips to Logan. Aiming to boost Logan Express 5-6

HOV by 2 million riders per year over the long term, Massport's comprehensive ground access strategy is nowhere near the scale needed to keep pace with this level of growth. The increase in SOV during just the 2018 and 2019 period has preemptively almost entirely offset the hoped for long term HOV gains. The same can be said of growth in noise, and emissions. 5-6

We have chosen to include this example of ground access impacts within our Activity Levels comments as this proves the wisdom in MEPA's directive that mitigation be commensurate with growth. It also highlights the enormity of the challenge facing Massport and community mitigation planners and the need for farther reaching and more powerful policies to be put on the table if continued unchecked growth is being planned for at Logan.

Along with the supersized growth of flight and passenger levels recorded in this reporting period alone, came a series of equally unmitigated related increases, each of concern:

- Nighttime operations grew by 17%
- The population exposed to 65 DNL or greater grew by 10%
- Average weekday on-Airport vehicle miles traveled (VMT) increased by 6.7%
- Blue Line fare gate activity declined by 24%
- Logan Airport emissions of Carbon Monoxide (CO) pollution increased by 16%
- Logan Airport emissions of fine particulate pollution (PM 2.5 - 10) increased by 19%
- Logan Airport emissions of Nitrogen Oxides (NOX) pollution increased by 7%
- Logan Airport emissions of Volatile Organic Compounds (VOC) pollution increased by 2%

Mitigation

The 'commensurate' and 'outpacing' directives require that new mitigation be devised to keep pace with growth. However, while we see that the EDR provides lists of existing mitigation, the large majority of these are legacy programs (some over 40 years old), or fringe programs unable to mitigate the massive annual increases in impacts posted year after year. Throughout the EDR instead, Massport maintains that the pandemic related decline in activity levels seen after the reporting period abrogates the responsibilities they were required to adopt in the Secretary's certificate.

MEPA should not sanction this self-prescribed exemption. Instead, we hope that MEPA will stand by its correct 2017 ESPR certification and redouble its efforts to seek Massport's compliance. As we will explain in our comments on the example of Massport's request for FAA funding of additional soundproofing below, Massport's extremely low level of ambition to mitigate impacts, more than the cost or viability of these programs, is the key obstacle to progress. The EDR's lack of responsiveness to additional mitigation again puts MEPA into the role of arbiter, and challenges the Secretary to demand the mitigation planning required. 5-7

We hope that MEPA will enforce its certificate in a manner which will move Massport to mobilize its full capacities as a motivated and ambitious leader in environmental mitigation. This is the

Massport we are waiting for. This is the Massport that pushed for the country's first residential soundproofing program in the 1980's. Only a motivated and committed 'activist' Massport will be able to overcome the obstacles to advancing innovative mitigation once again in Boston.

Noise Mitigation

The EDR offers the welcome news that Massport has submitted updated noise maps to the FAA Regional Assistant Administrator to address issues with first-generation soundproofing installations which could lead to further FAA funding for retrofits in older soundproofed homes. It is important that Massport is acknowledging the need for further soundproofing. Now, 13 months after their initial communication, Massport should escalate their efforts by writing to the regional administrator with cc to our federal delegation. They should submit a grant application to the FAA for additional funding, and if rejected, they should use landing fee money to fund this necessary program. Massport's FAA fundraising entreaties should not be mistaken for new mitigation for impacts occurring because of their airfield user's activity. 5-8

We appreciate the Port Authority's efforts to encourage single engine taxiing and use of vortex generators on Airbus aircraft. As in the example of annual increases in SOV traffic provided above, and the CO emissions savings achieved through Massport's alternative GSE program below, the accumulated benefit of all of these efforts is small in comparison to any single year's increases in noise as a result of flight operations growth. It would be most helpful if Massport would model or otherwise provide comprehensive analysis and discussion of the relative noise abatement value in DNL or other terms of such programs in relation to increases in noise driven by operational growth, as it is otherwise difficult for MEPA and commenters to ascribe value to the accumulation of these efforts. 5-9

AIR, Inc.'s Noise Impact Team has offered to engage with Massport in discussing a variety of additional noise mitigation strategies. We are confident that if Massport mobilizes its full capacities within a collaborative planning framework, we can devise effective solutions which can reduce total noise impacts as air travel to the region grows. Massport, in our November meeting agreed to meet with our Impact Teams, but with their focus in submitting the EDR, and our focus subsequent to submission on responding, no date has been set.

The difficulty we have had in arranging topical meetings with Port Authority staff in this and the air filtration example above underscores the importance of our suggestion above that MEPA require changes to its unique iterative reporting structure. Specifically, MEPA should require that Massport conduct a regular schedule of meetings with legitimate community advocacy groups. The structure of these meetings should not be determined by Massport staff, but by MEPA, in consultation with community partners. 5-10

Health

In East Boston, 1,000 additional children likely live with Asthma, an equal number of seniors battle COPD, and countless community members suffer heart disease, stroke, obesity, sleep disturbance, cancer, and learning impairments *as a result of increased exposure to airport*

pollution. We can quarrel over the science, or applicability of health outcomes to aviation specific ultrafine and other pollutants if we choose. Or we could choose to accept the obvious implications and conclusions of modern research science and take action now, out of caution. The likelihood of increased morbidities and premature mortality are burdens which families in airport impacted communities will carry throughout this recovery period and for the rest of their lives. With this in mind, the urgency and scrutiny with which we examine these iterative ESPR and EDR documents must rise sharply and steadily, and not be delayed on account of the temporary reduction in impacts caused by the pandemic.

5-11

Noise and Health

Noise annoyance is an important health disability. World Health Europe's systematic literature review is widely accepted as providing the most definitive policy guidance available. WHO Europe strongly recommends that aviation noise be kept below the 45 dB Lden (the 24 hour equivalent of our DNL). This recommendation is problematic for airports and industry noise generators, as it is approximately 50 times lower than the present FAA 65 DNL threshold.

On this topic we must pause. While Massport reports in answering Representative Madaro's comments in the response to comments section of its responses to the MEPA certificate for the ESPR 2017 that they have had several calls with AIR, Inc. to discuss this EDR, there is, as is unfortunately often the case between Massport and community advocates, an important disparity in perspectives: of the three calls between us, the first was an early pandemic update in May, the second was focused on the Framingham Garage Expansion, in April, and the last call, which was the first EDR working session was a Zoom meeting held in November, two weeks before Massport told us they would be finished writing the EDR.

The fact here is that AIR, Inc. has repeatedly and consistently offered collaboration with Massport inside and outside of the MEPA process. We have requested to have detailed topical mitigation discussions with Massport, but the Port Authority staff has not made time to include our views. In this example, the EDR's review of research on the health impacts of noise presents evidence to MEPA which was considered in isolation and implies incorrect conclusions without having given AIR, Inc.'s Health Impact Team an opportunity to discuss and perhaps reconcile some possible points of contention. Specifically, while the EDR included WHO Europe's review in its listing of relevant studies on noise, it casts doubt upon it noting that its strength of evidence has been criticized. Massport also listed ICCAN's rapid evidence assessment (REA) and noted that it was also critical of WHO Europe's conclusions.

The effect of Massport's editorial commentary produces a misleading implication that the scientific evidence is inconclusive, or unreliable. We were surprised that Massport would attempt to devalue the WHO review in this manner. Misleading and incorrect information is an impediment to our shared goals. As part of our review of the EDR, we convened discussions about this within our Health Impact Team, as well as with our European noise advocacy counterparts. Had Massport collaborated with AIR, Inc. as instructed through the ESPR 2107 MEPA process, a more balanced report could have been reached.

MEPA should know that criticism of WHO's methodology was mainly led by Norwegian acoustician and aviation industry consultant Truls Gjestland who raised concerns about: 1) a degree of bias in sampling practices used in one of the studies cited by WHO; 2) that WHO included too much material from Schiphol Airport in Amsterdam which might be too specific to Amsterdam and not as widely applicable as WHO assumes, and; 3) that too many of the studies WHO used were from airports where outsized public reaction to 'new noise' may have distorted findings and recommendations.

We don't question Mr. Gjestland's credibility in his assessment of WHO, but ask that MEPA consider that all research is subject to academic sniping, but in its reporting on the health impacts of noise, Massport misses the most salient point: that European airports and governments have accepted the overall body of evidence on the health impacts of noise including the WHO Review, as well as the SoNA, Defra, and ICCAN research as legitimate drivers of policy. We believe it is important that MEPA understand that the debate has changed in Europe over the last decade or so, and we believe this carries important implications for how Massachusetts, as a leading center of science and progress should progress. 5-12

Our European counterparts explain: "In the UK the turning point came when Heathrow was refused permission for a third runway in 2010. A third runway was what Heathrow, the UK aviation industry and the civil servants in the Department for Transport wanted above all else. Yet the incoming coalition Government led by the Conservatives – the traditional party of business – had turned it down and in effect backed the eight year campaign by the local community and environmentalists against it.

The industry was in shock and retreated to assess things. Heathrow came to realise that, unless it improved its relationship with the community, it was going nowhere. The more progressive people within the organisation were given more senior positions. There was also a shake-up of staff in the Department for Transport, with a younger generation coming to the fore who were more community and environmentally-minded."

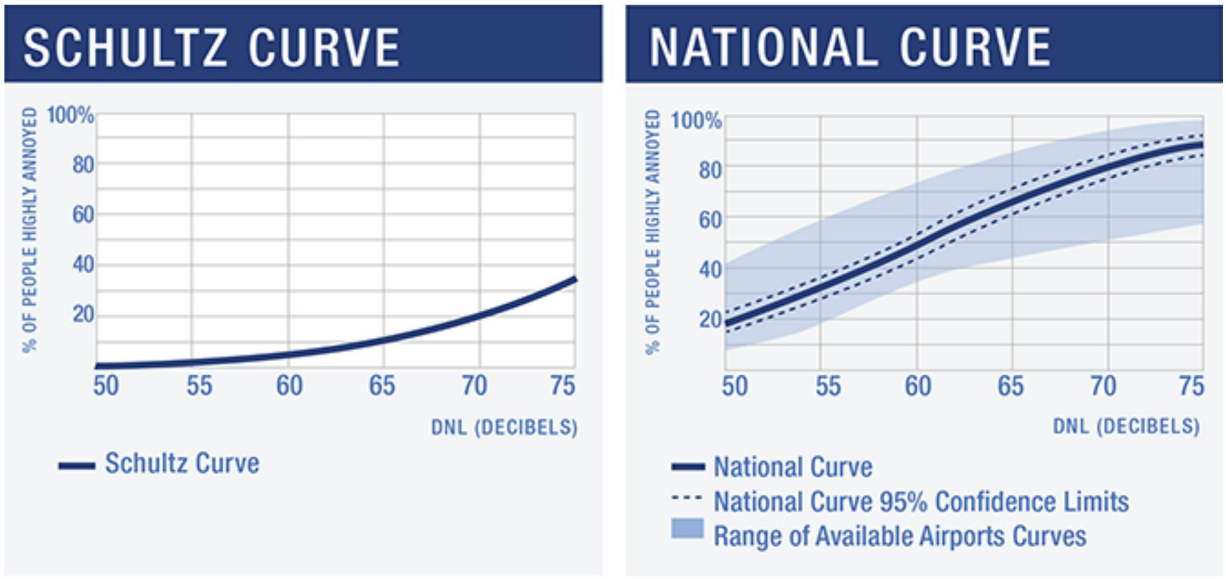
While airport activists in Europe concede that the aviation industry, is a powerful lobbying force within the European Union, they believe the changes at Heathrow and the Department for Transport have begun to influence change across Europe. They see signs of reasonably meaningful engagement with communities that was largely absent 20 years ago and guess that the independent advisory group ICCAN, which Massport paints as opposing WHO Europe's recommendations will be broadly supportive of them.

Had Massport met with us specifically about the available health research on noise, we could have bypassed this distraction and collaborated on a joint recommendation to MEPA as to what reasonable actions Massport could take to employ this knowledge in its mitigation planning. 5-12

Neighborhood Environmental Survey

The Neighborhood Environmental Survey (NES) commissioned by the FAA, was released earlier in 2021. This scientific survey found a jaw-dropping increase in jet noise annoyance in

the US. The findings of the NES show that twice as many people are highly annoyed by aviation noise at the 50 dB DNL level than were previously reported to be annoyed at the 65 dB DNL exposure level. This shakes the foundations of the entire basis of the FAA's noise program and validates 50 years of community advocacy on noise impacts. FAA will now need to re-examine their use of the 65 DNL as the threshold of significance for noise annoyance. This will necessitate changes in mitigation strategies.



The new Survey was designed to use a consistent approach across each airport community surveyed. This has allowed for an enhanced ability to provide additional statistical information about the new results, such as the 95% Confidence Limits and range of results from each of the 20 airports, as shown on the plot above. This was not possible with the older Schultz Curve.

It is important to not that the revelations provided by NES track precisely with the similar recent WHO Europe and Defra studies in Europe, and support the conclusions that:

A. Noise is a public health issue
B. Noise abatement in the US / FAA system is the responsibility of Airport operators
C. And things need to change now

Emissions and Health

Massport's 2019/2019 EDR listed of a handful of reports, but did not provide a helpful discussion and analysis of how air pollution from aircraft at Logan could be reduced or mitigated. Through our 9 year long Health Initiative, AIR, Inc. has developed extensive contacts within the research community which we believe can be helpful. We hope that the Secretary will ask Massport to join with our Health Impact Team in reviewing the important health research and investigating possible responses. We believe a very prescriptive directive is needed as now 15 months have elapsed since the issuance of the 2017 ESPR certificate.

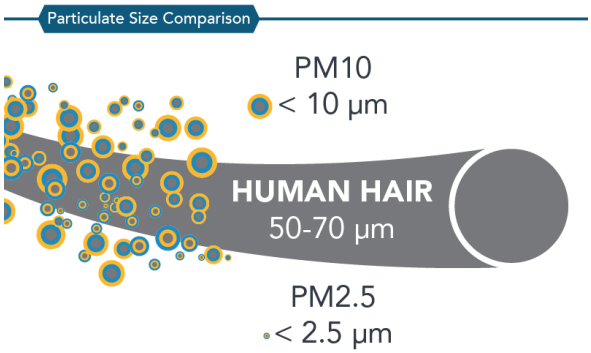
5-13

Below we have provided a basic listing and explanation of the criteria pollutants reported on in the EDR to illustrate the state of knowledge about the pollutants and their impacts on human health and to exemplify how the EDR might have handled this reporting requirement.

Carbon Monoxide (CO)

Logan Airport emissions of Carbon Monoxide pollution increased by 16% between 2018 and 2019.

The EPA website on CO pollution in outdoor environments states that elevated outdoor CO levels are of particular concern for people with heart disease who already have a reduced ability for getting oxygenated blood to their hearts in situations where the heart needs more oxygen than usual such as when exercising or under increased stress. In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain also known as angina.



PM10/PM2.5

Logan Airport emissions of fine particulate matter pollution increased by 19% during the two year reporting period between 2017 and 2019.

The California Air Resources Board's website (CARB) describes airborne Particulate Matter pollution (PM) as: Particles of pollution which are 10 microns or less (PM10) in diameter are inhalable into the lungs and can induce adverse health effects. Combustion of gasoline, oil, diesel fuel or wood produce much of the PM2.5 pollution found in outdoor air, as well as a significant proportion of PM10.

- Older adults with chronic heart or lung disease, children and asthmatics as the groups most likely to experience adverse health effects
- Children and infants are susceptible to harm from inhaling pollutants such as PM because they inhale more air per pound of body weight than do adults
- Children's immature immune systems may cause them to be more susceptible to PM
- Children in communities with high PM2.5 have slower lung growth, and smaller lungs at age 18 compared to children in communities with low PM2.5 levels
- CARB reported that exposure to PM2.5 contributes to 5,400 premature deaths due to cardiopulmonary causes, 2,800 hospitalizations for cardiovascular and respiratory diseases and about 6,700 emergency room visits for asthma per year in California

Nitrogen Oxides (NOX, or NO2)

Logan Airport emissions of Nitrogen Oxides pollution increased by 7% between 2017 and 2019. Logan emissions of NOX in this reporting period hit an all-time high.

The American Lung Association describes Nitrogen Oxides as a gaseous air pollutant composed of nitrogen and oxygen formed when fossil fuels are burned at high temperatures, which contribute to particle pollution and to the chemical reactions that make ozone. Nitrogen dioxide causes a range of harmful effects on the lungs, including:

- Increased inflammation of the airways
- Worsened cough and wheezing;
- Reduced lung function
- Increased asthma attacks
- Greater likelihood of emergency department and hospital admissions
- New research warns that NO2 is likely to be a cause of asthma in children
- People with lung cancer face greater risk from exposure
- Linked to cardiovascular harm, lower birth weight in newborns and increased risk of premature death

The EDR reports that increased NOX is a trade-off for less noise and fuel efficiency, but offers no substantive suggestions on how to reduce the NOX burden on Logan's neighbors. 5-14

Volatile Organic Compounds (VOC)

Logan Airport emissions of Volatile Organic Compounds pollution increased by 2% during the two year reporting period between 2017 and 2019.

The World Health Organization (WHO) says VOC's enter the body through the lungs or through the skin, causing symptoms that may lead to pathologies, including asthma, dermatitis and neurological problems. Some VOCs are classified by the International Agency for Research on Cancer (IARC) as carcinogenic for humans.

Ultrafine Particulate Matter (UFP)

While not regulated by EPA, a University of Illinois study explains that UFP's are present in the air in large numbers and can enter the body through the lungs but translocate to essentially all organs. Compared to fine particles, they cause more pulmonary inflammation and are retained longer in the lung. Exposure to PM0.1 induces cough and worsens asthma. PM0.1 causes systemic inflammation, and predisposes individuals to ischemic cardiovascular disease and hypertension. PM0.1 are also linked to diabetes and cancer. PM0.1 can travel up the olfactory nerves to the brain and cause cerebral and autonomic dysfunction. Moreover, in utero exposure increases the risk of low birthweight.

Image: Distribution of UFP's around LAX

UFP's have been measured in 6-8 times average urban levels extending 10 miles under flight paths at major airports. 70% of the measured outdoor levels of these unregulated pollutants have been measured indoors in a study of ultrafine pollution in Chelsea released in 2017. This has great relevance to discussions about strategies to mitigate Logan's pollution.

Pollution monitoring

Regarding the geo-spacial distribution of pollutants, the EDR disingenuously reports that Logan contributes only 1% of the state's total emissions (2% of the NOX). If it were spread across the 10,555 square mile landmass of Massachusetts, Logan's pollution would be of little concern. However, as seen above in the graphic illustration of UFP pollution measured under LAX flight paths, the distribution of pollutants from mobile sources including motor vehicles and aircraft is highly concentrated near the sources, and therefore pollution impacts from Logan are highly localized and create acute health impacts. This information is essential to the discussion of Airport pollution. Further discussion of the implications of Chelsea and other research would have been helpful.

5-15

While the EDR points out that UFP pollution is an area of ongoing research, there is enough evidence of extreme and growing UFP and EPA criteria pollutant exposure to exceed any standard of reasonable concern. Massport at their own discretion then, may take whatever action in researching, mapping, monitoring, or reducing exposure which they feel is needed. The FAA has no authority to impede Massport's efforts to mitigate airport impacts; will often not act unless forced to by Congress, and; when forced, routinely drags its deliberations out for years using endless studies and reports which more often than not lead to findings of no significant impact.

Airport Sources of Pollution

95% of Logan emissions come from aircraft. Since they do not control engine technology, Massport does not currently have any emissions reduction programs that deal with 95% of Airport pollution. *With Massport limiting their emissions reduction focus to only the smallest segmental sources of pollutants under their direct control, even large reductions amount to fractional overall reductions in pollution*. In the example of their commendable efforts to reduce pollution from ground service equipment (GSE), the 18.4% reduction in CO from GSE-related sources reported amounts to a 0.37% overall reduction in Logan airport CO. The 16% increase in CO from all airport sources during the same period is 43 times more than what will be saved 5 years from now.

While all of the data used for the AIR, Inc. analysis above is harvested from the EDR, without such a contextual discussion Massport leaves MEPA with the impression that its varied efforts are exhaustive. While Massport is correct in reporting that they do not control Airport noise and pollution pollution, they have the power to activate considerable resources in pursuit of a wide variety of avenues that could help.

We hope that MEPA will recognize that the Port Authority is not powerless to make any change, but that where there is a will, there is a way. And while influencing things like airlines' choices of airports, or sizes and types of aircraft used may be rife with many challenges, it will not be done through inaction.

We ask that MEPA indulge us in one more thought: the Massachusetts Port Authority is in tremendous financial good health even despite the pandemic, and should therefore be able to afford the planning responses necessary to make the progress we seek. As evidence of this last point, we note that Moody's has recently assigned an Aa2 rating to Massport revenue bonds, and reports that the outlook for Massport is stable. In fact Boston Logan International Airport was the only airport to achieve this rating. Moody's notes that Logan is "supported by Boston's strong and diversified economy anchored in high technology, biotechnology, healthcare and higher education. This combination of high origin and destination demand from a strong non-leisure based economy and diversity of carrier mix is one of the key credit strengths of the authority and we expect the demand for air service out of BOS to recover." They explain that Massport's FY 2019 debt service coverage was 3.57x on a Moody's net revenue basis. Importantly, Moody's adds, "Through the last quarter of FY 2020, the authority took several actions to bolster its finances, including a $40 million reduction in operating expenses, suspension or deferral of $850 million of capital projects and a taxable direct purchase transaction which provided additional financial flexibility. These actions resulted in debt service coverage decreased only slightly to a still robust 3.19x, or 3.67x with the benefit of $57.1 million of CARES ACT funds and strong liquidity levels at approximately 700 days cash on hand.".

So MEPA can rest assured that the Port Authority can well afford to plan and mitigate Logan impacts.

Noise Health Impacts

Nighttime Noise

Massport's most recent estimate for growth of nighttime flight operations was provided in ESPR 2017. This estimate forecasted an average of 168 operations per night as we reached Logan's long term planning horizon c. 2032. With the average number of operations per evening period already at 168, in 2019 when this forecast was made, the 2017 ESPR essentially predicted that nighttime operations would not increase over the coming decade. The EDR reports:

- Nighttime flights climbed to 16.6 percent of total operations in 2019, respectively, increasing 16% during this reporting period from an average of 168 per night in 2017 to 195 per night in 2019
- 81% of night flights occurred between 10:00 - 12:00 AM and 5:00 AM - 7:00 AM time slots

In ESPR 2017, Massport predicted that international flights would comprise the largest percentage of flight operations growth over the near future. In this EDR, Massport attributes the

increases in nighttime flights to increases in flights to international destinations. *The conclusion we reach is that without any nighttime flight restrictions, increases in international operations will correlate directly with increases in nighttime noise.*

The EDR's data on the growth of nighttime operations treats all nighttime operations the same. This hides the real story: because although the total number of night flights has only gone up 35% or so over the past 17 years, more louder Jets are more frequent at night now than in the past. Whereas carrier Jets comprised 69% of total nighttime operations in 2000, the increase in overall number of operations, and the shift in fleet composition wherein 90% of operations, especially international and cargo are comprised of a larger, louder category of aircraft, nighttime noise at Logan is up 75%.

AIR, Inc. has considered Massport's additional report that 81% of night flights occur outside of a core (12:00 AM - 5:00 AM) overnight timeframe, versus within the peripheral periods (10:00 PM - 12:00 AM, and 5:00 AM - 7:00 AM). This information is totally misleading in that the FAA approved DNL metric for aircraft noise establishes a 10dB penalty for noise occurring between 10:00PM and 7:00AM precisely to account for the increased impact of airplane noise during those hours. Massport's attempt to redefine the authorized noise metric established by FAA is completely unjustified. What the copious scientific evidence makes perfectly clear is that loud aircraft noise events interrupt the restorative circadian rhythms and sleep / wake cycles of residents during the times when they are sleeping causing negative health effects. 5-16

Preferential Runway Advisory System (PRAS)

AIR, Inc. has requested that Massport update PRAS in multiple EDR / ESPR comments. Hopefully we can begin a dialogue about this in the coming year. From the perspective of in-close communities with far greater health and environmental impacts, an updated and more effective PRAS would be valuable. However, there is broad agreement among our diverse Noise Impact Team which includes in its leadership, leaders from impacted RNAV communities across the metropolitan area, that an updated PRAS would rationalize noise impact dialogues across the region. By providing target percentages for impacts and dwell and persistence goals, PRAS provides all impacted communities with benchmarks against which they may measure Massport's progress toward fair distribution of noise impacts, and it is responsive to community needs. 5-17

We reiterate that updating PRAS was a condition of the FAA Record of Decision of 2002. That Massport reports that the Logan CAC voted to abandon PRAS should not be taken by MEPA as an indication that PRAS is defunct. The FAA RoD is legal mitigation in Massport's Airport Improvement plan and does not offer either Massport, or the LCAC the authority to abandon PRAS. The RoD specifically states that PRAS shall remain in place until replaced or updated. 5-17

In our previous comments, we have suggested that in the event that Air Traffic Control (ATC) is unable to implement PRAS effectively while this runway use program (RUP) is classified as an Informal RUP, Massport could respond by submitting an application to FAA to upgrade PRAS to a Formal RUP. When queried about this and nighttime flight restriction proposals, Massport has

exhibited a defeatist attitude, suggesting that such applications would be a waste of time since they would be denied. Such assessments do not excuse Massport from its responsibility to act and to advocate with the FAA on behalf of its impacted citizens.

Emissions

One of the steps ESPR 2017 MEPA certificate required was that Massport increase collaboration with a variety of partners including non-profit community groups. AIR, Inc. stepped forward immediately to initiate discussions around collaboration, build a shared understanding of the research on airport impacts and discuss mitigation alternatives. Massport declined our initial invitation due to their need to respond to the developing implications on Logan Airport of the global pandemic at the time. A series of check-in and update emails and telephone calls took place over the spring and summer of 2020, but Massport staff were unable to meet with us regarding potential collaborations until November 11, 2020 a few weeks before their planned end of the drafting process for the present EDR.

The delays in coordinating our initial MEPA related discussion left us without time to make any substantial progress. During our first Zoom meeting, AIR, Inc. members expressed our belief that a) a series of separate topical meetings around traffic, noise, traffic and public health impacts would be needed in order for our expert impact teams to meet with Massport's area-specific staff to explore more detailed collaboration and assist them in developing their review of relevant research, that; b) reductions in load factors and reluctance to return to HOV modes resulting from COVID 19 may have additional impacts on the relationship between air travel volumes and pollution levels. Specifically we are concerned that as the recovery of air travel volumes return, per passenger environmental impacts will be accelerated. We have suggested to Massport that these factors increase the urgency with which we should develop our additional mitigation strategies going forward, and that; c) given the financial and staffing impacts the COVID -19 pandemic has had on Massport, and with the overarching goal of developing a system in which impact mitigation and reduction strategies remain commensurate with Airport growth, we have suggested that a mitigation scheduling approach be developed as part of our collaboration.

5-18

The intent of this proposal is twofold: first to allow for the recovery of air travel to commence, giving Massport time to staff up and rebuild its mitigation planning and funding capacity, and second to allow for a progressive approach to mitigating the impacts over time as they recover such that the needed programs and policies can be prepared in advance of any increase in the level of impact.

With the growing evidence of a multitude of increased morbidities related to exposure to air and noise pollution, Massport cannot possibly continue the practice of entering into agreements with individual healthcare providers to address specific concerns. The EDR reports that Massport continues to stay apprised on studies regarding impacts of aviation on air quality and public health, and points to Tufts research that shows increased gaseous and particulate pollutant concentrations in residential measurements when wind was blowing from the airport compared to when it was not.

The EDR also cites studies conducted by the University of Southern California and the University of Washington which demonstrated adverse health effects following exposure to airport and roadway traffic-related UFPs, distinguished roadway from airport sources and showed distinct health impacts associated with each source. However, in order to assess the impacts at Logan airport, site specific science is needed.

Regulation

Even while recognizing the recent research, the EDR reports that EPA has only just begun to reconsider a NAAQS for UFPs due to their unique physical attributes and potential human health hazards. Massport concludes that this reassessment would be the next opportunity to consider including UFPs among the criteria air pollutants, and warns that the link between UFP exposure and adverse health effects, although suggestive, may not rise to the level of promulgating a new NAAQS at this time. Massport adds (despite the research considered above) that while studies have begun to explain the dispersion characteristics of UFPs from airports, specific health studies are needed to assess impacts of UFPs from airport sources.

AIR, Inc. has done everything in our power to partner with Massport in evaluating how established and emerging science might be incorporated in Airport policy and mitigation strategies. Without such partnership, on its own Massport may end up adding UFP's to its current set of criteria pollutant reportbacks and mitigation strategies. But mere compliance with future EPA or subsequent FAA guidance which may be 5 - 10 years away will leave us essentially in the same position as we are today: with ineffective regulation allowing continued exposure of our children, elders, and families to extreme pollution.

5-19

AIR, Inc. shares the public's expectation and hope that honest conversation, innovation and leadership can lead to far more expeditious and effective solutions. We hope that MEPA will agree and use this review as a means of leveraging the collaboration needed.

United Airlines and biofuel

The EDR reports the interesting fact that United Airlines has agreed to purchase up to 10 million gallons of cost-competitive, commercial- scale, sustainable aviation biofuel over the next two years.

The EDR does not make certain whether 5 million gallons of commercial biofuel will be available in this timeframe, how many of those gallons will be used at Logan, or what beneficial impact such use may have. AIR, Inc. notes that in 2019 United Airlines alone burned 4.3 billion gallons of jet fuel in 2019, while Massport's tenant airlines burned 20 million gallons on Logan's tarmac, and another 20 million over metro Boston during landing and takeoff. United made a $3 billion profit in 2019, off $43 billion in revenue. The top 5 airlines at Logan earned $11.5 billion in profits in 2018. So clearly, the burning of fossil fuels is a profitable practice which is likely to continue long into the future. We are happy to hear that alternatives are being investigated. But reports of change and innovations which are unlikely to amount to anything should not be used to defer mitigation that can be affected now.

Changing Models

The EDR reports that the FAA has again changed its emissions modeling methodology. This results in further confusion. By way of explanation, Massport adds, *"As an example of these differences, there was a 30.2 percent increase in PM10/PM2.5 aircraft emissions in 2018 between AEDT 3c and AEDT 2d that is attributable to a change in methodology used to estimate PM emissions in the AEDT model (i.e., FOA 4.0 versus FOA 3.0). Similarly, there is a 32.4 percent increase in PM10/PM2.5 aircraft emissions in 2018 when applying AEDT 3c compared to 2017 when applying AEDT 2d. This is also attributable to the aforementioned modeling methodology change in addition to differences in fleet mix and operations between the two years."*

With constantly changing methodologies, how can MEPA or the public possibly participate in a constructive conversation about relative growth and improvement in pollution? AIR, Inc. suggests that with Massport and FAA's documented failure to develop a reasonable and stable baseline against which emissions policy and mitigation can be measured, future EDR documentation should be based upon actual emissions measurements.

5-20

Ground Access Mitigation

The EDR reports that much of Massport's ground access planning has been put on hold due to the drop in impacts caused by the pandemic. With HOV reported to be down 84%, Logan's SOV trip percentage is set to spike dramatically just as vaccinations rise and air travelers take back to the skies; a traffic congestion perfect storm is coming.

At 2019's 40% HOV level, with passenger volumes at around 42 million, average annual daily trips (AADT) to Logan reached about 140,000 trips per day resulting in roughly 84,000 SOV average daily trips to Logan, by far in excess of our regional and local roadway capacities. At this level, traffic congestion routinely backed up in multiple locations across the region and clogged local and citywide arterial streets and highways. Unless the current 16% HOV rate which has been reported in this EDR improves dramatically, the critical 84,000 AADT will be surpassed with a return of 60% of Logan's 2019 passenger volume, at around 25 million annual passengers. Considering all of the previously mentioned factors, the level of recovery is possible within the coming year.

While Massport makes promising general statements about encouraging HOV trips to the airport, they haven't taken substantive action or set ambitious goals to do so. They set a goal of 40% HOV trips, then changed the definition of an HOV trip so that it was met with little mode shift toward sustainable options. Other Massport initiatives such as free 30-minute parking for pickup/dropoff trips are actually counterproductive to the stated goal of reducing airport trips. Generally, as seen in the areas of noise and emissions mitigation, Massport demonstrates little appetite to promote an actual mode shift. A fundamental flaw in Massport's perspective in the report is that it frames demand (e.g. demand for parking, demand for Uber/Lyft trips) as fixed, and takes the approach that Massport must accommodate this demand rather than implementing strategies to adjust this.

There are a number of effective ways Massport could reduce single-occupant trips and generate revenue:

1. Transit investment in a variety of projects
2. Tolling RideApp trips, similarly to what was done in Chicago, $8 fee for Uber/Lyft trips to the airports
3. Decreasing the availability of short-term parking
4. Imposing a toll on all vehicles entering the airport

AIR, Inc.'s Ground Access Impact Team has suggested BRT strategies in past comments on the Framingham
Logan Express Garage Expansion. These, and other existing HOV programs must be taken back up by Massport if it is serious about increasing its ground access HOV mode share, especially in light of the pandemic's impact on Logan Express ridership. Curiously, the EDR reports a variety of incentives and price adjustments which prove over and over again that mode choice decisions are particularly dependent on price and other cost considerations. 5-21

Logan Express

With environmental justice communities once again in the crosshairs of the worst of Logan's soon to be growing ground access impacts, the Woburn, Back Bay, and Peabody Logan Express locations should be ramped up once again to work in conjunction with the above-mentioned congestion pricing programs. This two pronged approach is truly the only option left for Massport to incentivise suburban passengers into HOV modes.

As part of their multi-pronged approach to expanding HOV, Massport should not pause, but should now reinvigorate their plans to open the North Station urban location and accelerate their efforts to find at least one new suburban location. 5-22

Otherwise, there are no surprises in the EDR's Logan traffic disclosures:

- Average annual daily trips (AADT) to Logan increased by 10% attributed primarily to RideApp and general increase in drop-off/pick-up activity by private and commercial automobiles
- RideApp activity increased 16% 2018 - 2019
- Logan Express ridership from suburban locations increased 19% 2018 - 2019 in response to extreme roadway congestion driven by Logan-bound traffic
- Logan Express ridership is now down 84% October 2020 compared to 2019 due to traveler apprehension over social distancing guidance
- RideApp use increased over 16%
- MBTA Blue Line ridership declined 25%
- Back Bay Logan Express ridership declined in 2018 when Massport raised fares back to $7.50 per passenger, then increased dramatically when the Port Authority incentivized this service with security line preference and discounted fares (free to Downtown

Boston/$3 to the Airport) Riders with a current, valid MBTA pass received reduced $3 fare

Massport's Logan Passenger Ground Access Survey shows that the largest segment of air travelers are not interested in Massport's HOV enticements. Urban travellers and those from further out beyond 495 each for various reasons are shown to adopt HOV modes much more readily, compared to suburban travellers between the urban core and 495. While stating its goal to increase use of HOV, Massport has seemingly bumped into a constraint beyond which they are unwilling to pass: use of financial disincentives for SOV modes.

It is crystal clear that the combinations of availability of options or lack thereof and the range of financial and convenience costs which would drive large-scale adoption of HOV mode choices among suburban travelers have not been found. Ample evidence presented in these disclosure documents points to a direct relationship between increases in financial and convenience costs and behavior change, yet Massport rather than pushing on the obvious levers available to them has refrained.

Massport, as the mitigator of other people's pollution, is placed in the position to need to make difficult decisions. How forcefully or whether they act to drive behavior change with implications on public health in the balance has been a topic of repeated emphasis in our comments. We believe this must be a matter of open public debate. If there is a reason not to wage more powerful disincentives upon the cost/benefit mix which creates the present suburban HOV impasse, Massport should be expected to present and be prepared to defend it. Importantly, in response to media reports and public calls for discussion of the application of congestion pricing strategies to influence the Logan SOV ground access decision making process, Massport unilaterally announced in 2018 that they would not consider an airport roadway fee.

With long term growth trends showing that demand outstrips capacity and backsliding of HOV ridership MEPA should require a full analysis of the potential effectiveness and cost of congestion pricing at Logan.

Conclusion

Briefly, we are sorry to have needed to provide such extensive comments. We were hoping for a far different sort of dialogue. We fell that now is not the time to pause, but instead that we should use the temporary reduction in impacts as an opportunity to accelerate our efforts to make Logan the healthiest possible air travel facility.

Sincerely,

AIR, Inc.
395 Maverick Street

East Boston, MA 02128

Air Partners
Franklin W. Olin College of Engineering
1000 Olin Way
Needham, MA
02492

March 20, 2021

Tori Kim
Director of MEPA
100 Cambridge St., Suite 900
Boston, MA
02114

Dear Director Kim,

I am writing on behalf of the Air Partners group at Franklin W. Olin College of Engineering, which has developed strong ties to community stakeholders in East Boston, Winthrop, Revere, and Chelsea over the last 5 years aimed at understanding and mitigating airport-related air quality impacts in their neighborhoods. Taking a community-engaged approach, our research starts with community concerns and aims to provide data that support the air health goals that communities are already working to achieve. The outputs of this work take many forms, including a pilot community-owned air monitoring network, an app that makes those data available in real-time to residents, pilot HEPA air purifier deployments in schools and residences with monitoring and evaluation to characterize their exposure benefits, and contributions to legislative efforts such as HD.3739 and SD.2323: An Act Improving Air Quality in Airport Environmental Justice Communities.

An important preface to the comments that follow is that the motivation of Air Partners is to work with communities to both understand the sources and impacts of air pollution (of which Logan Airport is the most significant) *and* to propose and test effective mitigation strategies. Our work with communities, therefore, is oriented toward gathering evidence for how to reduce pollutant exposure for the greatest number of near-airport residents on as short a timescale as possible and for the lowest cost possible. To that end, these comments are oriented toward initiating a conversation between the MEPA office, community stakeholders, and Massport to leverage our pilot data in such a way that more effective *and* cost-effective mitigation strategies can be codified and supported through Massport mitigation investments. So please read these comments as an invitation to deeper-level conversation about how our data and community partnerships can be the foundation of MEPA-directed and Massport-funded air health in the communities surrounding Logan Airport.

The comments that follow address four main themes, each supported by original data collected through work initiated and supported by the Air Partners group in collaboration with community

partners at AIRInc, Mothers out Front East Boston, and our legislative partners Rep. Adrian Madaro and Sen. Joseph Boncore:

1. The need for air monitoring as opposed to only modeling studies in future EDRs,
2. The importance of routine UFP measurements and reporting,
3. Gaps in mitigation investments, and
4. HEPA air purifiers as an effective mitigation strategy.

The need for air monitoring

The British statistician George E.P. Box is quoted as saying: “All models are wrong, but some are useful.” While the AEDT/EDMS models employed in the Massport EDR reports are helpful in understanding the total amount of criteria pollutants generated on the tarmac at Logan Airport, they do little to accurately predict the community-level impact of those pollutants in the surrounding areas. While total pollutant emissions as reported in the EDR (in tons/year) are one factor in determining those impacts, dispersion models - particularly those that have minimal characterization of atmospheric chemistry processes - are severely limited in accurately predicting the high spatial and temporal granularity of downwind impacts over the long term. Further, these models have no characterization of the air quality impacts of individual aircraft on an arrival or departure trajectory over the surrounding communities. *To close this gap, real air monitoring on exposure-relevant spatial and temporal scales is necessary to fully understand the air quality impacts of Logan Airport on the surrounding communities, and should be the foundation of air quality evaluation in future EDRs.* 6-1

In collaboration with community partners, the Air Partners group has established a community-owned air monitoring network comprising 13 air sensors in East Boston, Winthrop, Chelsea, and Revere, measuring NO, NO_2, CO, CO_2, O_3, PM_1, $PM_{2.5}$, PM_{10}, and size-resolved particle concentrations between 300 nm and 15 μm. Data from this pilot network has revealed important trends in air quality that cannot be captured by the models currently employed in EDR reporting.

For example, concentrations of NO are strongly dependent on wind direction for the four air sensors closest to Logan Airport, and regularly exceed NAAQS standards (Figure 1). Two important trends can be observed. First, the highest concentrations of NO are typically observed when wind is coming from the direction of the airport, and those concentrations regularly exceed NAAQS for NO. Second, in the case of sensor SN62, the highest concentration of NO actually originates from a different direction, corresponding to the location of a major shipyard to the south of that site. Routine, long-term, and spatially dense measurements of real ambient air quality are essential in understanding the localized impacts of Logan Airport emissions in the surrounding communities, but also in distinguishing between airport impacts and impacts from other sources - including shipping, roadways, and local point sources. Without routine **monitoring** of real air pollutants, these associations are impossible to characterize. Future EDRs must employ ambient monitoring data from an expanded network of sensors modeled after that established by Air Partners in order to actually characterize community-level air quality impacts. 6-2

Figure 1: Polar plots indicating the relationship between wind direction and NO concentration.

Second, continuous air quality measurements reveal the impacts of *individual aircraft* on the local community in a way that models cannot capture. Figure 2 displays a time series of particle concentration data collected in Winthrop's Point Shirley, on the approach to runway 27. Using FAA aircraft position data superimposed onto size-resolved particle concentrations, the impact of individual aircraft arrivals is clearly captured in real-time, 1-min resolution data. Models are simply unable to capture these impacts, and routine, continuous measurements are necessary to understand the full picture of not only total tarmac emissions, but also airborne aircraft emissions on the surrounding communities.

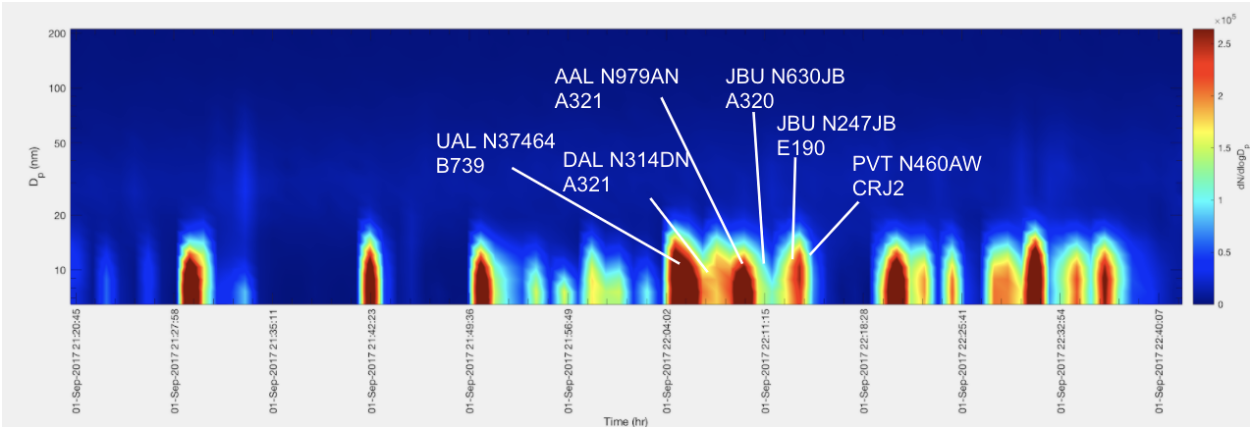


Figure 2: Impact of individual aircraft on particle concentrations at a site on the approach to runway 27 in Winthrop.

To summarize, while modeling studies can be helpful in understanding the total generation of pollutants by an important source like Logan Airport, routine, highly spatially- and temporally-resolved pollutant measurements are necessary to understand the real air quality impact of Logan Airport. The Air Partners group, in collaboration with community partners, has established a proof of concept for such a measurement network, at a cost of $6000 per sensor

6-3

and $600 per sensor per year for data and maintenance. Scaling this network to an exposure-relevant network of 200 sensors across East Boston, Revere, Chelsea, Winthrop, and South Boston would cost $1.2M, and require between $60,000 and $100,000 per year to operate. Data can be made publicly available with minimal effort, and these data would vastly improve the real environmental data and community-level impact characterization included in future EDRs. We encourage MEPA to direct Massport investments toward expanding this network.

6-3

The importance of UFP measurements and reporting

We acknowledge Massport's cooperation and support of ASCENT efforts to characterize UFPs around Logan Airport. While results from those studies are forthcoming, it is already clear that Logan Airport's impact on UFP exposure in the surrounding communities is enormous. Data collected by the Air Partners group at a site just north of runway 22R in October, 2020 indicates that idling and departing aircraft generate plumes of UFPs that regularly exceed 100,000 particles cm^{-3}, which is a factor of 10 higher than the urban background and 2-5x higher than one would experience in close proximity to a major roadway (Figure 3). Further, these plumes are highly correlated with extremely high CO, NO and NO_2 concentrations. While efforts like the ASCENT study provide data to academics for publications, we encourage MEPA to direct Massport investments to support continuous, community-owned measurements and reporting of UFPs in the surrounding areas. UFP measurement capability can be built into the capacity of a monitoring network described above for a cost of $400,000, assuming that 10% of the 200 air monitoring sites measures UFPs. With increasingly strong associations between UFPs and the most detrimental human health impacts of air pollution, it is in the best interest of MEPA, the DEP, and DPH to begin understanding the dynamics of Logan Airport generated UFPs on the surrounding communities, as UFP regulations are assuredly on the horizon in the United States. We encourage MEPA to lead in this regard by directing Massport to make investments in UFP monitoring infrastructure.

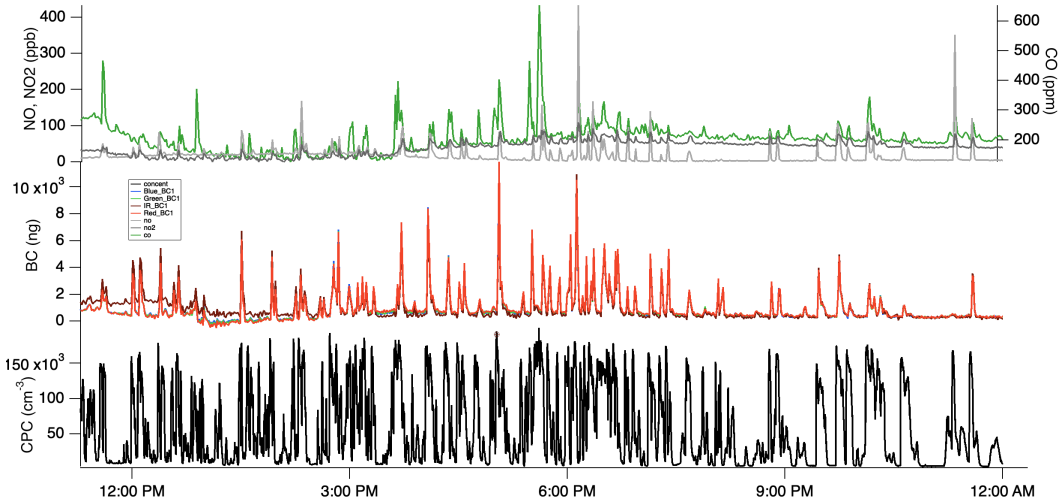


Figure 3: Departure plumes of UFPs (CPC data), BC, NO, and NO_2 measured at a site north of runway 22R.

HEPA Purifiers as effective mitigation

We acknowledge the long-term air health benefits possible by employing the emissions reduction strategies outlined in the 2018-2019 EDR, and encourage continued investment in science, technology, and policy to realize those goals. In the meantime, however, the surrounding communities are impacted by significant concentrations of airport- air pollutants in the ambient environment. Further, our data, as well as data from colleagues at Tufts University, indicate that indoor pollutant concentrations average 70% of ambient levels, meaning that a substantial amount of airport-generated pollutants are found inside area residences, classrooms, and other environments.

The Air Partners group has worked closely with community partners to propose, fund, and run a pilot program focused on providing free HEPA air purifiers to residences and classrooms in near-airport communities, and to monitor and evaluate their efficacy at reducing UFP, PM_1, and $PM_{2.5}$ exposure indoors. Through laboratory studies of commercially-available HEPA purifiers, we have identified characteristics that define a highly effective device, including a high (>200 m^2) area of HEPA filter medium, a sufficiently high flow rate to achieve at least one air change per hour, and a high exit velocity of air to ensure proper air mixing in the room. Examples include the Austin Air Healthmate and IQAir Healthpro.

Figure 4 displays indoor/outdoor ratios of UFPs measured at an East Boston residence downwind of Logan Airport, before and after installing a HEPA purifier. Before installation, indoor concentrations of UFPs averaged 72% of those experienced outdoors, which reduced to 19% after an Austin Air Healthmate was employed in the home's main room - representing a 72% reduction in indoor UFP exposure.

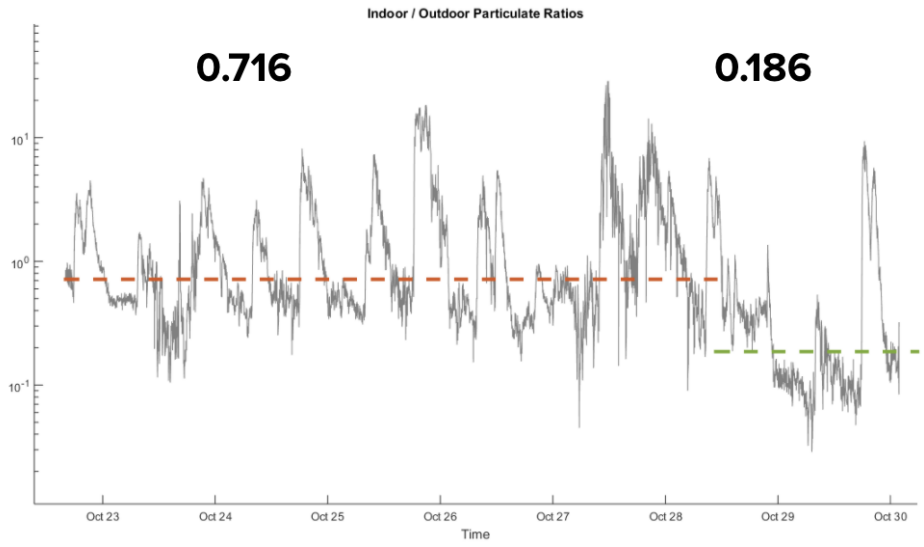


Figure 4: Indoor/outdoor UFP concentrations in an East Boston residence before and after HEPA purifier installation.

Subsequent studies in 6 homes, 10 municipal offices, and 12 area classrooms have indicated that appropriately-specified and operated HEPA purifiers result in an average exposure reduction of 65% across a range of particle sizes from UFPs to PM_1 (example from one classroom displayed in Figure 5), with a range of 40-94%.

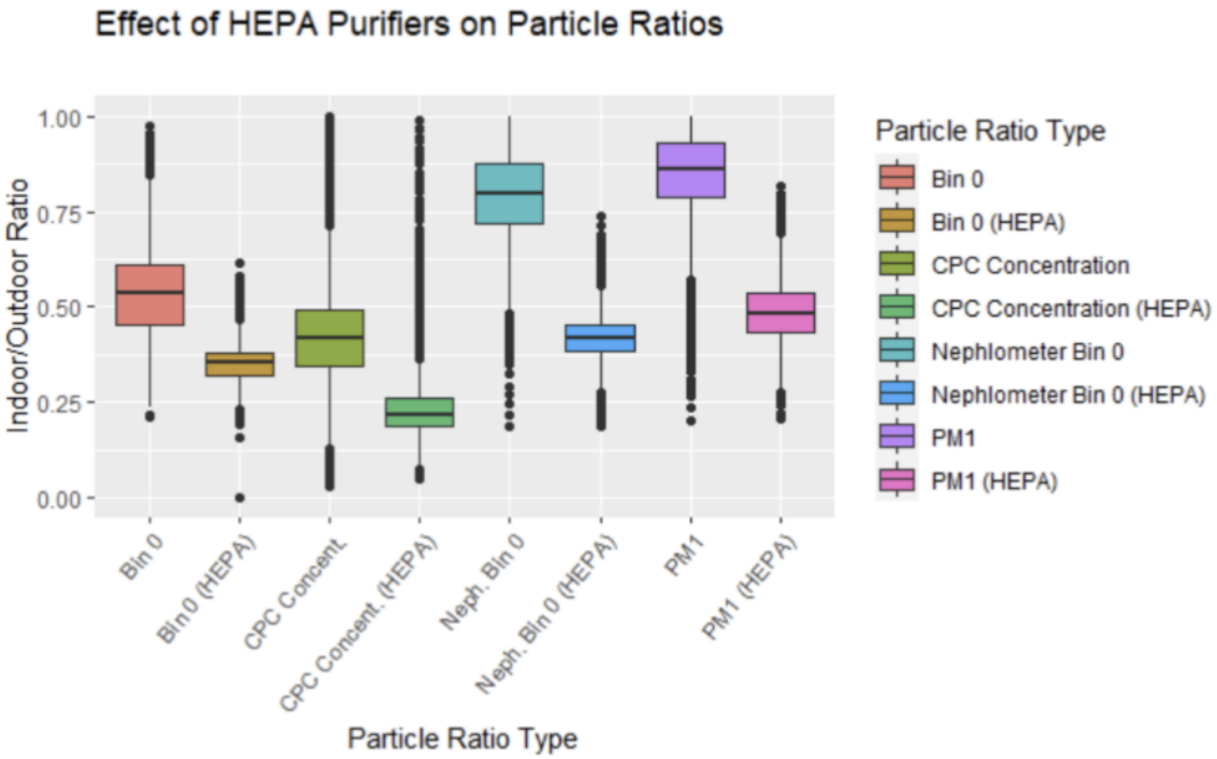


Figure 5: Impact of HEPA purifiers on indoor/outdoor particle ratios in a near-airport classroom, as measured by an optical particle counter (bin0; 300-500 nm particles), CPC (5-1000 nm), nephelometer (nephelometer bin 0; ~100-300 nm), and PM_1 (OPC and nephelometer).

Based on these results, we encourage MEPA to direct Massport mitigation investments toward actual air quality investments in the form of no-cost HEPA air purifiers to residences, classrooms, businesses, and other indoor environments within a 2 mile radius of Logan Airport. At a cost of $100 per classroom per year and $300-500 per residence per year for an appropriately specified and effective HEPA air purifier, these investments are multiple orders of magnitude lower than Massport already invests on a per-household basis for soundproofing, and we anticipate that they will result in substantially greater health benefit. The Air Partners team, with our community partners, are eager to engage MEPA and Massport in conversations to strategize effective, HEPA-based mitigation work, including scaled-up pilot programs with monitoring and evaluation, as well as developing and testing strategies to ensure high compliance by users of HEPA purifiers.

Gaps in mitigation

In 2020, AIRInc identified a significant discrepancy between projected and actual growth in passenger load in the 2011 and 2017 EDRs. This discrepancy, projected to be on the order of 10M passengers between 2019 and 2024, has led to a significant underfunding of mitigation from Massport. We refer to AIRInc's EDR comments for more details, and encourage MEPA to hold Massport accountable to close the gap in mitigation underinvestment that has shortchanged the near-airport communities over the last decade. On the basis of our mitigation pilot results described above, we suggest that these mitigation gaps be closed through investments in an expanded network of air monitors, routine UFP measurements, and (especially) HEPA purifiers in the local community. 6-4

Conclusion

To conclude, the 2018-2019 Massport EDR indicates that Massport is making some progress in reducing emissions and planning for a future characterized by lower air quality impact on the surrounding communities. However, the modeling strategy employed in the EDR is severely limited in its availability to capture the true air quality impact of the airport, and emissions reduction plans do little to reduce residents' exposures in the near-term. Communities surrounding Logan Airport have been harmed by a significant gap in mitigation investments based on faulty passenger load projections in EDRs dating to 2011 and prior. We therefore encourage MEPA to direct Massport investments in expanded, exposure-relevant, and public-owned air monitoring, continuous UFP monitoring, and air mitigation in the form of no-cost HEPA purifiers to the surrounding communities. As always, Air Partners is eager to support these efforts through expanded data collection, expanded pilot programs, and pragmatic strategy development. Please do not hesitate to contact us to continue the conversation. 6-5

Sincerely,

Dr. Scott Hersey, Air Partners PI
Franklin W. Olin College of Engineering

This Page Intentionally Left Blank.

From: Sonja Tengblad
To: MEPA (EEA); Canaday, Anne (EEA)
Subject: Public Comment for Boston Logan International Airport 2018/2019 Environmental Data Report
Date: Wednesday, March 10, 2021 8:43:10 AM

To the MEPA review board,

As the coordinator for Mothers Out Front East Boston, mother and resident of East Boston, I am calling for collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections and subsequent rise in pollutants including Nitrous Oxides and Carbon Monoxide, as shown in the latest EDR. 7-1

We know that Massport has suffered major financial losses during COVID. However, the residents of East Boston continue to have long-term health implications: a 360% increase in childhood asthma, and 200% increase in adult COPD. These health implications have affected our community even more this year, as East Boston experienced the highest COVID rates in Boston. As a Harvard T.H. Chan School of Public Health study outlined, people exposed to higher levels of ultrafine particulate matter saw an 8% increase in COVID mortality.

“Many of the pre-existing conditions that increase the risk of death in those with COVID-19” [cardiovascular and respiratory diseases like asthma and COPD] “are the same diseases that are affected by long-term exposure to air pollution.” They found “statistically significant evidence that an increase of 1 g/m3 in long-term PM2. 5 exposure is associated with an 8% increase in the COVID-19 mortality rate.”

When discussing reopening of schools, we have to choose whether or not to open the windows and expose our children to outdoor pollution, or ventilate for COVID. A working mom down my street gave up her job because she couldn’t work at home, and was fearful of her asthmatic son contracting COVID at daycare. Another mom I know whose son has acute asthma and who contracted COVID didn't tell him for fear that he'd have high anxiety.

As a community, we welcome collaboration and conversation on how Massport and East Boston’s families can co-exist in healthier ways. Air filters (of particular models) placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing. Let's be on the right side of history in caring for highly polluted neighborhoods, especially environmental justice communities who are predominantly families of color. 7-2

Thank you for your consideration,
Sonja Tengblad
63B Maverick Square Apt. 2
East Boston, MA 02128
763-210-8198

--
She / Her / Hers
Soprano | **www.sonjatengblad.com**
Wellesley College | Music Performance Faculty in Voice
Beyond Artists | Founder
Mothers Out Front East Boston | Coordinator

Stephen H. Kaiser
191 Hamilton St.
Cambridge Mass. 02139

To : Kathleen A. Theoharides, Secretary, Office of Energy and Environmental Affairs
Attention : Anne Canaday MEPA Office : anne.canaday@mass.gov

From : Stephen H. Kaiser, Principal Civil Engineer, MEPA 1976-1988

Cc. Brad Washburn, Massport : Bwashburn@massport.com

Subject : Environmental Data Report, Massport EEA #3247 2018-2019

By accepted tradition, Massport's Environmental Data Report for the years 2018 and 2019 would be a continuation of its unique format and contribution. But it would also be expected to serve as a lead-in to next year's review of the revolutionary changes brought forth by COVID in 2020. The unspoken message would be : wait for another year to find out how COVID decimated transportation.

I was pleasantly surprised to find a welcome change in format. Where possible, the record of COVID-diminished performance from 2020 was included for comparison with the two previous years. The best examples of comparative data dynamics can be seen in Figures 1-2 and 1-3 in the Executive Summary.

Passenger count data was especially valuable to illustrate how Massport's customers were affected by the ongoing COVID experience. Fortunately, passenger counts can be assembled quickly and do not need further laborious processing – as required for estimates of noise exposure or air pollution emissions.

So valuable has been this inclusion of contemporary information that my conclusion is : Massport should adopt a new tradition to include recent passenger data for 2021 in next year's 2020 update. If the year 2020 has shown the extraordinary COVID impacts since last March, the current year may provide a window into the results of vaccinations and other controls to gain increased safety for airline travellers and personnel. This new format would be a lead-in to 2022, when we would anticipate that the COVID threat would have been substantially controlled.

8-1

How many of the lost passengers from 2020 can be recaptured in the data for 2021 and 2022? Massport so far has suggested their preference for a "return to normal" scenario. However, other factors may interfere, such as

* work-at-home and videoconferencing,

* major office complexes that are downsized to reduce rental costs,

* health restrictions on international and interstate flights, such as quarantines,

* tourist declines ; residual "fear of flying," and

* residual cautions about virus threats, distaste for airport security, and paperwork

All of these factors produce fewer airline, vehicle and transit trips. In other words, some of the passenger reductions wrought by 2020 and COVID19 will become permanent. Stated very simply, the year 2020 brought about very unstable times, with dramatic and unplanned changes, especially in the transportation sector. Massport passenger counts dropped precipitously, initially by 90 to 95%, while many MBTA services suffered similar reductions. And so did Amtrak, cruise ships, taxis and Uber. The least impacted appear to be autos and highway travel, with 20% declines fairly common, but 50% reductions occur on sections of the Mass Turnpike Extension.

Some questions have not even been asked of the data, let alone answered. Why should the largest declines in both highway travel and commuter rail occur in the western corridor (Framingham and Worcester)? 8-2

These sudden and massive patronage losses are beyond identification as merely"large." In years past a drop of the 20% in ridership would be considered very significant. Agencies might be able to develop plans to try to ameliorate such changes. However, passenger losses of 90 to 95% are beyond comprehension : a common agency response is "shell-shock"-- a dulling of the senses beyond rational grasp. What does a public agency do when faced last fall with 94% declines in ridership, as happened on MBTA's Framingham-Worcester Commuter Rail line? What does Amtrak do when confronted by 95 percent declines in ridership?? Full contraction to almost nothing has occurred on Eurostar train service in Europe, where passenger counts are down 95% and 90 percent of the employees have been laid off.

Such massive changes cross over the line of what is “thinkable” in terms of rational response and planning. The data extends beyond the boundaries that public agencies could conceive of and deal with. Government agencies may feel obligated to change all prior plans, to re-evaluate where they expect their transportation plans will go in the future. But a common human tendency in difficult times is refusal to accept unpleasant evidence presented to them, and instead deny the reality. It is the natural inclination of Public Relations and marketing personnel. (In recent years we might call it “Trumpian”).

This natural dulling of the senses has an unfortunate side effect : to ignore the data and meaning of massive change. Similar dulling of the senses occurs with climate change and flooding, especially along coastal areas. Denial is common when reality conflicts with development goals.

A most evident exception to public denial is Massport's present EDR. It takes the initiative to report on the extent of transportation changes at Logan Airport, and also includes information on other modes beyond aviation. The benefits of collecting this “vital data” and reporting on its implications can be seen by the fact that no other institution in our society -- municipal, state, Federal, academic, business, non-profit, professional or volunteer/advocacy group -- has been able to assess the impacts of the COVIC crisis on transportation generally. Even the Central Transportation Planning Staff has been a failure. They simply cannot do it, for whatever reason. Other activities have been affected to a similar degree -- hotels and restaurants are prime examples, but the business media have provided some coverage of this distress. A critical need exists for an honest assessment of the staggering COVID impact on almost all forms of transportation. It is a critical deficiency in our society. Based on reporting to date, the only entity capable of such an information review is Massport.

There are several reasons why MassPort is ideally situated to perform such an assessment of future possibilities, especially in the field of transportation. The Authority is familiar with issues of all types of aviation at Logan, vehicular access, parking, transit access, mitigation of auto travel, and issues of competition, such as Amtrak, as well as freight transportation and general aviation. The current EDR can serve as an initial effort to offer a multi-modal perspective on the current state of transportation in the Boston area, as well as trends for the future. I submit that no one else can do it : not MassDOT, not CTPS, not the MBTA, not the MAPC. No Federal agency, not USDOT, nor the Volpe Transportation Center has done this and none can do it. No municipality has the resources, skills, interest or professional outlook to take it on. While the universities claim an interest in doing research, some public agencies see themselves as oriented towards operations -- with no interest in research. Massport has an interest in both operations and research.

The MBTA has been tracking some ridership trends, and indicates that its transit system has shown a 75 percent ridership drop. The Blue line and buses have survived best with only 60 percent drops, while the Orange and Red Lines are below average with 80 percent drops. There is no web-site to offer the equivalent of EDR Figures 1-2 and 1-3 to show the up-dated timelines for passenger reductions and recoveries.

Neither is there an accesssible repository for timelines showing VMT, ADT and peak hour flows on sampled state highways. State highways have been the least affected transportation mode by COVID, with typical drops of 20 percent in ADT, but information on measured recovery towards "normal" remains skimpy.

Back in the late 1970s Massport did a traffic study of the Sumner Tunnel and reported lower traffic flows compared to earlier years. The report submitted to MEPA claimed as a result the tunnel would have sufficient residual capacity to handle future Logan growth. MEPA rejected the Massport report on the grounds that the reduced volumes were the result of congestion and stop-and-go traffic with less traffic flow, lowered traffic speeds and worsened efficiencies. Governor Ed King was elated because his Trumpish nature opposed new MassPort management. However, Massport officials realized their error, hired VHB to do a new tunnel study, and revised their report to indicate the nature of tunnel congestion. MEPA approved the new report. Ed King was not happy. Forty years ago MEPA would not tolerate a traffic misrepresentation for the Sumner Tunnel, and Massport responded heroically by reporting the truth.

Looking back forty years, I can now appreciate how rare this second report was coming from Massport, because it recognized the effects of Level-of-Service F effects on road congestion, speed and volume. To my knowledge, no such assessment of LOS F has ever been reported in any traffic study in Massachusetts, especially for Boston. Levels of service and congestion were not expressed in the landmark but suppressed Coverdale & Colpitts report of 1957 to Mass DPW. This state report indicated that 1975 traffic on the Central Artery would require twenty-two lanes, not the six lanes that had just been completed. It was a good report, but Mass DPW did not correct its errors and did not repair its damaged Inner Belt Master Plan.

Why should Massport be the only entity in the Commonwealth reporting on traffic truth? I believe the trigger was this same Coverdale and Colpitts report -- predicting the future overloading of the Central Artery. The growth in vehicles and traffic was so overwhelming after World War II that no highway system could have handled all those cars. The solution for state highway engineers was to make many of those embarrassing trips "disappear."

In 1963 a manipulated “solution” appeared in the form of trip assignment formulas based on a new mathematical formula : the BPR equation. This formula allowed trips on any highway link to approach infinity as speeds approached zero. That condition we would recognize today as gridlock, when nothing moves. The BPR equation is a completely wrong engineering aberration, inconsistent with real-world traffic flow under Level-of-Service F conditions.

Today, the Federal Highway Administration mandates use of computer models based on the 1963-vintage BPR equation and so does MassDOT and CTPS. None of these agencies can find the necessary grit to oppose the BPR equation. By contrast, Massport is aviation-based and is not restricted by outdated highway stipulations. If there is anyone who could analyze traffic conditions for volume, speed and travel times, based on hard data, it would be Massport. They should add those skills to assess traffic flow conditions to and from Sumner and Callahan Tunnels. They did it forty years ago. Any consideration of ground access to Logan Airport would be incomplete without such an evaluation of these two tunnels. 8-3

One brief comment is on a non-traffic matter with environmental implications. Many EIRS reviewed by MEPA discuss water quality impacts, and at times the issue of road salt usage has been discussed. Massport has snow and ice issues, but road salt is strictly forbidden. Why? Because of corrosion effects on aircraft. The airlines would never allow it. Woe unto any Massport employee who allows salt near planes.

How does state and local highway road salting work? When I served on the Road Salt Task Force back in the 1970s, the highest costs associated with road salt usage was corrosion damage to vehicles and bridges. Yet the public clamor about road salt was almost entirely focused on sodium damage to water supplies and trees. There were no automobile and bridge advocates complaining about road-salt corrosion. No equivalent to the airlines existed to compel transportation agencies to restrict salt applications.

Today, all across the country, we are finding corroded and spalling Interstate highways from the 1950s and 1960s reaching an end-of-life situation of typically 50 years. Meanwhile the Brooklyn Bridge is about 140-years old and still going strong. Many structures half a century ago were not built with protective membranes --- to save money in the short-run but not in the long run. The result is structurally deficient bridges -- due primarily to salt corrosion -- which have lifetimes less than many aircraft flying in and out of Logan Airport today.

Is it possible that Massport's policies on snow and ice control could be useful for highway agencies across the nation to reduce corrosion in their own bridges and for the millions of privately-owned vehicles

that are slowly rusting out as they travel the nation's highways? It is possible that someone could make a calculation of climate change consequences for each car that needs to be scrapped and replaced by a new one, for each bridge that must be demolished and replaced, and for each passenger aircraft scrapped and replaced by a new plane. Based on the large numbers of older Boeing 737s still in the air, the airlines must have a great incentive to continue using them.

In preparation for a 2020 EDR with supplementary 2021 passenger data, I suggest the follows steps in planning that would make the EDR even better :

1. **Calculate Load Factors** : Most of the passenger data for 2020 has been included in the Executive Summary, and from this data trends in load factors can be easily calculated for national and Logan experience. The data suggests that Logan load factors overall are only 70 percent of their previous pre-COVID levels. The MBTA was showing a 75 percent drop in load factor when previous service levels were maintained. Ridership on various Logan Express buses could also be included, along with bus load-factors. 8-4

2. **Develop Future Passenger Scenarios at Logan based on various factors** : 8-5

a. Gradual recovery to previous activity levels

b. Slowed long-term growth due to work-at-home, virtual meetings and travel, and cutbacks on company travel expenses. Also a reduced economic expansion, including a recession -- either short-term or long term, 8-6

c. Slowed recovery due to regulatory effects, such as requirements for quarantines due to differences in state and international regulations. The experience of Britain's national isolation as a result of a new virus strain is pertinent. 8-7

d. Resistance by certain elements in society against masks and vaccination, resulting in an extension of the COVID spread and delays in terminating the emergency. Also delays or quality control problems in vaccine distribution. 8-8

e. Possible expansion of air-freight due to continued package delivery such as Amazon. 8-9

f. More rapid recovery in airline passengers due to conventional tourist travel, rather than use of the decimated cruise ship industry. 8-10

g. Summary of national and international experience with transit operations in 2020 -- both passengers served, recovery rates and recovery strategies attempted. 8-11

h. Examples of airports that have recovered more rapidly than expected. 8-12

i. Compilation of auto occupancy studies in 2020, to determine the impacts on shared rides and car-pooling vs. Single Occupant Vehicles. 8-13

j. Compilation of airline industry data and experimental experiences dealing with change and recovery. 8-14

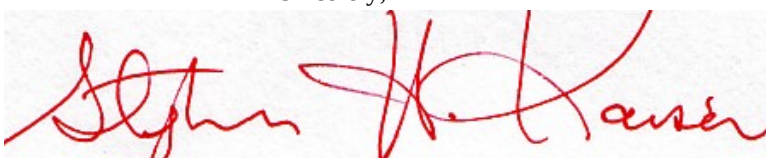
k. Explanation of major changes in plans to account for COVIC impacts, and illustrate initial experience in shifting over to the new plans. Many professionals recognize the importance of planning, but not the importance of changing the plans when conditions warrant. 8-15

l. In an appendix, include all of the one-page Masssport monthly aviation performance summaries to show passenger count changes for the years 2019 to 2021. 8-16

3. **Recommendations** to EEA/MEPA and MassDOT on any of the above topics where assistance from other state agencies would be most useful. The EDR is a complex undertaking. Massport should not be expected to shoulder the entire burden.

I close by again congratulating Massport for including 2020 passenger data in the 2018-2018 report, and thereby allowing an early warning sensitivity to recent transportation changes caused by COVID19. In terms of demonstrated excellence in performance, I estimate that MPA's only competitor is the Mass Water Resources Authority, which has survived less disruption, but also must deal with an annual budget which is 2/3 debt service and close monitoring by justices of the Court. It might be worth a meeting bringing together officials and staff of the state's two best Authorities -- Massport and MWRA -- to discover how they both managed to talk about the problems they had to solve and how they got the job done. 8-17

Sincerely,



Stephen H. Kaiser

This Page Intentionally Left Blank.

From: Czepiga, Page (EEA) on behalf of MEPA (EEA)
To: Canaday, Anne (EEA)
Subject: Fw: Public Comment; Logan Airport 2018/2019 Environmental Data Report
Date: Monday, March 1, 2021 9:47:19 AM

From: Emma Uppal <uppal.emma@gmail.com>
Sent: Sunday, February 28, 2021 2:08 PM
To: Canaday, Anne (EEA) <anne.canaday@mass.gov>; MEPA (EEA) <mepa@mass.gov>
Subject: Public Comment; Logan Airport 2018/2019 Environmental Data Report

To the Massachusetts MEPA office,

I write to you as an East Boston resident, parent, and small business owner. I am asking for some mitigation for our community because of the incorrect growth projections from 2018-2019 that were released in the latest EDR. 9-1

We have all been hurt by COVID in many ways, including financial, as I know Massport must be. However, our community and other environmental justice communities have long-term health implications, regardless of how slow travel was temporarily for 2020. Our neighborhood has a 360% increase in Asthma and a 200% increase in COPD. And our rates of COVID were the highest in Boston. As a Harvard T.H. Chan School of Public Health study outlined, people exposed to higher levels of ultrafine particulate matter saw an 8% increase in COVID mortality.

"Many of the pre-existing conditions that increase the risk of death in those with COVID-19" [cardiovascular and respiratory diseases like asthma and COPD] "are the same diseases that are affected by long-term exposure to air pollution." They found "statistically significant evidence that an increase of 1 g/m3 in long-term PM2. 5 exposure is associated with an 8% increase in the COVID-19 mortality rate."

Massport must consider all of the implications for East Boston residents of the increased travelers in and out of Logan; the increased air pollution, noise pollution, and traffic on our already-congested streets. We have to think, when discussing re-opening schools, if opening the windows to ventilate for COVID is worth exposing our kids to outdoor pollution. 9-2

East Boston residents would welcome collaboration on how Massport can co-exist with us without further poisoning our children's health. HEPA filters placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing. 9-3

Thank you for your time and for hopefully being a good neighbor.

Emily Uppal, East Boston resident, mother, and business owner

From: Czepiga, Page (EEA) on behalf of MEPA (EEA)
To: Canaday, Anne (EEA)
Subject: Fw: Environmental Data Report 2018/2019 open comments
Date: Monday, February 22, 2021 7:21:58 PM

From: Sheila Mooney <shebamoon@hotmail.com>
Sent: Monday, February 22, 2021 12:11 PM
To: MEPA (EEA) <mepa@mass.gov>
Subject: Environmental Data Report 2018/2019 open comments

Thank you for opening and receiving additional comments regarding the 2018/2019 EDR.

I am not in favor of proving DNL metrics/data wrong. The measurements have been in place since the mid 20th century. As such, the metrics belong to the past. Any transportation model which is based on the burning of fossil fuels is contributing to the planet's existential crisis, climate change. With or without RNAV, fossil fuel burning remains a dirty problem. The future is clean energy.

Mid 21st century transportation technology promises the world a cleaner future. For example, the auto industry intends to produce vehicles with zero emissions and no offsets by 2040.

1/28/21 New York Post, online: "GM has announced that by 2035 all vehicles in its production line will be electric."

2/19/21 New York Times OP-ED "The One Big Problem with Electric Cars": The company (Tesla) has amassed oodles of zero-emission regulatory credits that it sells to other car makers: in 2020 Tesla brought in more than 1.6 billion through credits without which it would have posted a loss."

What COMPARABLE clean energy commitments has the airline industry put forth and what is the timeline? 10-1

The timeline matters. We, who live under RNAV, have the additional health assaults associated with noise pollution. Clearly, everyone who breathes is at risk from the air pollution generated by dirty jet fuel. Micro-particulates kill.

2/9/21 The Boston Globe "Fossil Fuels Tied to 9 Million Deaths":
"In the United States, ingesting the fine particulate matter produced by burning fossil fuels kills an estimated 350,000 people a year, including more than 7,600 people in Massachusetts, according to the study by researchers at Harvard and other universities."

Additionally, "The scientists estimated more than 16,500 people are dying in New England as a result of fossil fuel pollution, with Massachusetts suffering the highest death toll." Furthermore, the study finds that even exposure to low level emissions over time are deadly. Our health and our planet are at stake.

The very energy hominins once used for survival is now hastening us to our demise. From "Kindred, Neanderthal Life, Love, Death, and Art" by Rebecca Wragg Sykes (RWS) in "Chez Neanderthal Paleo Pyro-technics":
"A most unexpected fuel for Neanderthals is coal."
RWS asserts, "Neanderthals were intentionally experimenting with fossil fuels."

How have we homo sapiens developed and innovated energy options since paleo times? We mined.
2/21/22 "Can Saudi Arabia Buy Time with Clean Oil?":
2019 greenhouse gas emissions reportedly weigh in at 15 million metric tons for #1 highest emitter, coal, and 13 billion metric tons attributable to #2 highest emitter, oil combustion. Modern man clings to primitive energy pursuits even as by-products from said energy sources threaten hominin existence itself.

To change course, away from fossil fuel, industry must innovate. If we can't innovate fast enough, then the airline industry needs to eliminate consumer incentives such as frequent flyer programs. Those who choose to fly should be subject to a sizeable environmental tax. Changing course will cost money and all must contribute.

Are we clever enough to change course? We know that Nature will correct the global warming. We know, also, that we might not like her terms.

From "Kindred," in "Ice and Fire-Climate Crisis" regarding paleo-climate MIS 5e, LEAP:
"The warmest temperatures (2-4 degrees C higher due to the position of Earth to Sun at that time) and highest sea levels existed for just 4 millennia between 126 and 122ka (thousand years ago) until gradual cooling began, but this was the calm before the storm." RWS notes that this time of climate crisis was marked by frightening and unpredictable weather.

Including "...at about 118.6ka....something odd appears: for precisely 468 years, dust rained down."

Dust, of biblical proportion. One might find that alarming. RWS doesn't mince words- from Kindred's epilogue:
..."we are heading into a world hotter and more dangerous than any previous hominin survived."

Lastly, she warns: "This future of blistering sun, suffocating cities, floods, tempest, and maybe more pandemics is like a bison thundering towards us. If we do not move fast, our children's children will be impaled."

Not only climatologists, but scientists of myriad disciplines are ringing the alarm. Aviation's alarm response was to engineer RNAV. RNAV is not an appropriate solution. RNAV simply "paved a new parking lot" for its dirty problem. Tens of thousands of Americans across the nation unwittingly shoulder the burden of offloading the aviation industry's fossil fuel emissions. We, the burdened, who dwell in the shadows under the narrow flight paths are made to absorb bulk, raw noise pollution, air pollution, and now (2/21/21 Boeing engine failures) the added stress of knowing about projectile debris events. (Heads up, debris events are common. Hard hats, everyone!)

This situation is unhealthy and unjust.

To my thinking, the affront of RNAV is, in and of itself, a form of impalement; NOT a form of environmental protection. It's time for the global airline industry to close the chapter on the burning of fossil fuels. This transportation model belongs to the past. Clean fuel must be our future. 10-2

Sheila Mooney

This Page Intentionally Left Blank.

Nancy S. Timmerman, P.E.
Consultant in Acoustics and Noise Control
25 Upton Street
Boston, MA 02118-1609
(617)-266-2595 (Phone) ; (617)-645-0703 (Cell)
nancy.timmerman@alum.mit.edu
nancy_timmerman@comcast.net

March 1, 2021

The Honorable Kathleen A. Theoharides, Secretary
Executive Office of Energy and Environmental Affairs
Attn: MEPA Office
Anne Canaday, EOEA No. 3247
100 Cambridge Street, Suite 900
Boston, MA 02114

Subject: EOEA No. 3247 – Boston-Logan Airport 2018/19 Environmental Data Report (EDR)

Dear Secretary Theoharides:

These comments are being transmitted by email. I have reviewed the 2018/19 Environmental Data Report (EDR), EOEA #3247, for Logan Airport, and offer the following comments and questions.

First of all, in view of the tremendous reduction in air travel in 2020, it seems the reliance on high occupancy vehicles (HOVs) would be counter-productive (Page 2 of the document). Recovery of public transit will take a while. I have noted before that flights arriving just before midnight and departures between 5 and 7 am cannot be served by public transportation. The MBTA, during the best of times, only runs between 6 am and midnight. This forces people to drive, use a taxi, or, perhaps, Uber. This was true during the time period reviewed. 11-1

In Table 6-8, on Page 6-42, it seems that there have been a number of recent technical issues with a number of the sites. It is good that efforts are still being made to keep them operational. In Table 6-13 on Page 6-51, the values of time above are computed. It is disturbing that the average above 65 dBA, which would certainly cause speech to cease, is 38.3 minutes in a 24- hour day, and the highest such value, in Winthrop, is 111 minutes, neatly 2 hours in 24. It is no wonder that Winthrop has historically objected to noise from the airport. 11-2

I also want to comment on buffer spaces and the land and water adjacent to the communities. I am aware that there are bioremediation practices which can be employed which reduce the flooding in the area. Some projects have shown that pollutants can be remediated. I am not an expert in this area, but have read some promising studies. Since there has been such a concern in the recent past over the effects of climate change, it would seem that newer/older approaches might be helpful. Technology has improved over the recent past. 11-3

I also want to state, for the record, that the responses in this report to my comments from last year were completely ignored. The response was boiler-plate. It is no wonder the airport has such a large public relations problem. I have commented on this report for the last twenty (20) years, and the replies are always the same.

Thank you for the opportunity to comment on this report.

Sincerely,

Nancy S. Timmerman, P.E.

Cc: S. Dalzell, MPA

Stephen H. Kaiser
191 Hamilton St.
Cambridge Mass. 02139

To : Kathleen A. Theoharides, Secretary, Office of Energy and Environmental Affairs
Attention : Anne Canaday MEPA Office : anne.canaday@mass.gov

From : Stephen H. Kaiser, Mechanical Engineer and Historian

Cc. Brad Washburn, Massport : Bwashburn@massport.com

Supplemental Comment : Environmental Data Report, Massport EEA #3247

Because of the extension of the deadline for public comment to March 12, I have had time to reflect further on issues raised in the EDR and my original comment of January 25.

Closer investigation of Figures 1-2 and 1-3 illustrates that both are based on TSA counts. However, seven-day data is plotted in Fig 1-2 and monthly data in Fig 1-3. The latter shows Logan passenger dropping to zero in early April 2020, while the seven-day change shows a 96 percent drop at the low point. I think the difference is how the curve for Logan is drawn through the monthly data points. The 96 percent figure apprears to be more accurate. 12-1

Tracking daily occurrences of anything can result in a very peaky curve, and the seven-day average is best for airport traffic trends and for following COVID data. Admittedly, monthly data is already collected and available, so the ideal solution is to collect the monthly summaries in a separate appendix.

Figure 1-2 represents the drop in passengers shown by an initial plunge of 94 percent. However Massport is entering a time of recovery, and the best format for the recovery may be to represent the initial condition as 6 percent, with the recovery curve ascending into a range of possible stable states between 30 and 100 percent of 2019 levels. I also see the recovery period as an effort to “claw back” former passengers lost by last year's collapse. The term refers to very active efforts by the airline, Massport, and Federal officials to create conditions that safely allow reconnecting with former passengers. Air travel has the advanatage of a band of supporters stronger and more active than the moribund transit industry. Airlines are less likely to remain in the ridership and economic doldrums for years into the future. 12-2

Examples of clawback activity include acquisition of smaller and more efficient aircraft, resolving issues of quarantines, and accurately estimating permanent passenger losses due to work-at-home or company decisions to cut back on business flights (which will be related to the quarantine situation). The quarantine situation will also be closely linked to the appearance of new COVID variants and the continued effectiveness of vaccines. One would hope greater stability in the state's computerized appointment system will work to improve progress toward a trustworthy Zero-COVID future – when the masks can come off. 12-3

It would appear that domestic flights with completed vaccinations would be allowed earlier than international flights that depend on the quarantine situation. It is possible that the primary vaccination facilities could be at airports, to handle passengers who tested positive or have no vaccination record. An option of immediate vaccination at the airport could result in reduced quarantine requirements. However, from public information available, it does not appear that top state and Federal officials have worked out these strategies yet.

Because quarantines appear to be a major factor in airport recovery, I would suggest that an international survey be collected (by someone) to investigate various experiences with quarantines to date. Singapore, for example, has very stiff penalties for violations … with years in prison and thousands of dollars in fines. Britain and South Africa as the origin of new variants have also had quarantines imposed on them by other nations. If the U.S. becomes the source of a new variant, it should be prepared. 12-4

Reviving the tourist business has similar concerns about quarantines, but has the advantage of recovering business previously carried by Cruise lines, and now the most moribund form of transportation. Both airline travel and Cruise lines could benefit from European proposals for combining COVID vaccination status data with passports. Quarantines could be substantially reduced. The details are still being worked out.

Because of the unpredictable arrival of variants, COVID digital passports may need to be quickly updated to indicate that a new problem has arisen that clouds the validity of such passports. With the sudden emergence of a new variant, a rush to obtain updated vaccinations could risk overloading medical facilities, whereever they are located. Modern vaccine technology offers us the opportunity for hope and solutions that were not available a century ago to deal with the 1918 influenza crisis. But there will need to be special precautions taken at the health gateways to our society – namely our airports. Next year's EDR will allow an opportunity to work through various straegies so that the logic works to maximize efffectiveness and allows Logan Airport to function close to pre-COVID levels.

I am also seeing reports suggesting that the last to be vaccinated with be the children, who may not be innoculated until early next year. It is unlikely that a Zero-COVID clearance can be declared unless children are fully vaccinated, because children use the airlines too.

Airport security is a factor, combining with COVID to present delays, paperwork and schedule uncertainties. The ability to keep TSA operations as tolerable as possible, combined with smooth processing of plane arrivals and departures, will be of vital importance. Any duplication of the recent overloaded state vaccine-appointment process must be avoided at all costs. The combination of delays, uncertainties and undermining of public trust is the perfect storm no one needs.

One trend already evident in airline plane orders is for smaller, single-aisle aircraft. The goal would be to retain service for lower total volumes of travelers. The new planes would be expected to be quieter and more fuel efficient, but this information may not be available for some time yet.

As I noted in my earlier comment, Massport is in a leadership position to illustrate how to set a transportation recovery target and meet it. Other MassDOT agencies in highways, transit, and planning have not demonstrated they can assess the data on the extraordinary transportation collapse we have recently experienced as a society. Massport representing government and the airlines representing private business will need to work together creatively as never before. 12-5

Sincerely,

Stephen H. Kaiser

Principal Civil Engineer, MEPA 1976-1988

This Page Intentionally Left Blank.

From: Eleanor Kebabian
To: Canaday, Anne (EEA)
Subject: Public Comment for Boston Logan International Airport 2018/2019 Environmental Data Report
Date: Monday, March 8, 2021 2:49:38 PM

To the Massachusetts MEPA office,

I am a mother and resident of East Boston, and calling for collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections, as shown in the latest EDR. 13-1

The residents of East Boston continue to have long-term health implications: a 360% increase in childhood asthma, and 200% increase in adult COPD. These health implications have affected our community even more this year, as East Boston experienced the highest COVID rates in Boston. As a Harvard T.H. Chan School of Public Health study outlined, people exposed to higher levels of ultrafine particulate matter saw an 8% increase in COVID mortality.

“Many of the pre-existing conditions that increase the risk of death in those with COVID-19” [cardiovascular and respiratory diseases like asthma and COPD] “are the same diseases that are affected by long-term exposure to air pollution.” They found “statistically significant evidence that an increase of 1 g/m3 in long-term PM2. 5 exposure is associated with an 8% increase in the **COVID**-19 **mortality** rate.”

When discussing reopening of schools, we have to choose whether or not to open the windows and expose our children to outdoor pollution, or ventilate for COVID. A working mom down my street gave up her job because she couldn’t work at home, and was fearful of her asthmatic son retracting COVID at daycare.

At my own home, pre-covid when we are out on the roof deck there is a cloud in the air that hovers over our house, the effects of all the air traffic is clearly visible to us. Rather than having that inside our house we have to live like they do in China, where all windows and doors are constantly closed and we heavily filter the air in our house. It's a huge loss that we can never have fresh air because of the air pollution.

As a community, we welcome collaboration and conversation on how Massport and East Boston’s families can co-exist in healthier ways. HEPA filters placed in all public schools within a 2 mile radius would cost just a mere $1 million dollars, a drop in the bucket considering the affects had on the residents. 13-2

Thank you
Eleanor

From: Czepiga, Page (EEA) on behalf of MEPA (EEA)
To: Canaday, Anne (EEA)
Subject: Fw: 2018/2019 EDR Input
Date: Thursday, March 11, 2021 10:37:11 AM

From: Teresa Doyle <teresamother@icloud.com>
Sent: Wednesday, March 10, 2021 4:51 PM
To: MEPA (EEA) <mepa@mass.gov>
Subject: 2018/2019 EDR Input

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

To whom it may concern,

We moved to our JP neighborhood in 1996. Since 2016 we have been subjected to extreme amounts of airplane traffic flying in a very low, very tight route directly overhead. This flight pattern can start as early as 5 am and can continue for 8+ hours. Another common flight pattern starts around 2 pm and can go for 7+ hours. There can be less than a minute between flights leading to non stop airplane noise. We are living under a noise tunnel.

I have been contacting my elected officials for years. I am repeatedly told to log complaints with Massport. I have been logging weekly complaints with Massport since 2018 with no results. I have reported my experience to the FAA who also passed blame on to Massport. 14-1

This is a plea for help.

Thank you,
Teresa Doyle
11 Robeson St
Jamaica Plain, Ma 02130

Sent from my iPhone

This Page Intentionally Left Blank.

From: Alyssa Vangeli
To: Canaday, Anne (EEA); MEPA (EEA)
Subject: Public Comment for Boston Logan International Airport 2018/2019 Environmental Data Report
Date: Friday, March 12, 2021 11:23:23 AM

To the Massachusetts MEPA office,

I am a resident of East Boston and a mother with two young daughters ages 3 and 6. I'm writing to urge collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections, as shown in the latest EDR. 15-1

On many occasions, I have had to opt to not take my kids outside to play because the smell from the airport is overwhelming and I'm deeply worried about their health. When discussing reopening of schools, we have had to choose whether or not to open the windows and expose our children to outdoor pollution, or ventilate for COVID.

The residents of East Boston continue to have long-term health problems: a 360% increase in childhood asthma, and 200% increase in adult COPD. These health implications have affected our community even more this year, as East Boston experienced the highest COVID rates in Boston. As a Harvard T.H. Chan School of Public Health study outlined, people exposed to higher levels of ultrafine particulate matter saw an 8% increase in COVID mortality.

We urge Massport to consider placing HEPA filters in all public schools within a 2 mile radius as one concrete and effective mitigation strategy. Please consider this request for the health and benefit of our children. 15-2

Thank you for your consideration,
Alyssa Vangeli
198 Everett Street
East Boston 02128
978-807-6089

This Page Intentionally Left Blank.

From: Carla Ceruzzi
To: Canaday, Anne (EEA)
Cc: MEPA (EEA)
Subject: Public Comment for Boston Logan International Airport 2018/2019 Environmental Data Report
Date: Friday, March 12, 2021 9:55:43 PM

To the Massachusetts MEPA office,

I am a parent of two and resident of East Boston since 2010, and am calling for collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections, as shown in the latest EDR. In the decade I've lived here, the pollution, the noise, and the car traffic have all increased substantially. The presentation I attended presenting the draft EDR emphasized that there is less pollution and noise than in the 1970s (before I was born). I think it's time to stop trotting out that line of argument and make a good-faith effort to improve the situation as it is now. That would start with acknowledging the miscalculations and the heavy burden they have imposed on the families of East Boston. 16-1

We know that Massport has suffered major financial losses during COVID. However, the residents of East Boston continue to have long-term health implications: a 360% increase in childhood asthma, and 200% increase in adult COPD. These health implications have affected our community even more this year, as East Boston experienced the highest COVID rates in Boston. As a Harvard T.H. Chan School of Public Health study outlined, people exposed to higher levels of ultrafine particulate matter saw an 8% increase in COVID mortality.

“Many of the pre-existing conditions that increase the risk of death in those with COVID-19” [cardiovascular and respiratory diseases like asthma and COPD] “are the same diseases that are affected by long-term exposure to air pollution.” They found “statistically significant evidence that an increase of 1 g/m3 in long-term PM2. 5 exposure is associated with an 8% increase in the COVID-19 mortality rate.”

As a community, we welcome collaboration and conversation on how Massport and East Boston’s families can co-exist in healthier ways. HEPA filters placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing. Good-faith efforts to encourage public transit use over car traffic and hold airlines accountable for noise and pollution would also help! It's what anyone would want for their kids, their families. 16-2 16-3

Thank you for your consideration.

Carla Ceruzzi

This Page Intentionally Left Blank.

From: Carrie Van Horn
To: Canaday, Anne (EEA); MEPA (EEA)
Subject: Public Comment for Boston Logan International Airport 2018/2019 Environmental Data Report
Date: Friday, March 12, 2021 11:07:15 AM

To the Massachusetts MEPA office,

I am a mother and resident of East Boston, and am calling for collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections, as shown in the latest EDR. 17-1

We know that Massport has suffered major financial losses during COVID. However, the residents of East Boston continue to have long-term health implications: a 360% increase in childhood asthma, and 200% increase in adult COPD. These health implications have affected our community even more this year, as East Boston experienced the highest COVID rates in Boston. As a Harvard T.H. Chan School of Public Health study outlined, people exposed to higher levels of ultrafine particulate matter saw an 8% increase in COVID mortality.

“Many of the pre-existing conditions that increase the risk of death in those with COVID-19” [cardiovascular and respiratory diseases like asthma and COPD] “are the same diseases that are affected by long-term exposure to air pollution.” They found “statistically significant evidence that an increase of 1 g/m3 in long-term PM2. 5 exposure is associated with an 8% increase in the **COVID**-19 **mortality** rate.”

When discussing reopening of schools, we have to choose whether or not to open the windows and expose our children to outdoor pollution, or ventilate for COVID. A working mom down my street gave up her job because she couldn’t work at home, and was fearful of her asthmatic son retracting COVID at daycare.

As a community, we welcome collaboration and conversation on how Massport and East Boston’s families can co-exist in healthier ways. HEPA filters placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing. 17-2

Personally, though we hear planes taking off and landing continually, taxi-ing in overcast weather is SO LOUD sometimes that it shakes our house and wakes us up. AND YET, we have been told we are not eligible for MASSPORT soundproofing. I have a son who attends a local East Boston school. I am writing for him and his future.

Carrie Van Horn
617-388-5282
3 Hooten Court
East Boston

- Logan Airport is one of the busiest airports in the country, and one of a few housed in very close proximity to families.
- During the 2018-2019 year, Logan Airport's forecasts were off by 300%; they saw 9 million passengers they were not planning for, and car traffic increased exponentially as a result.
- We believe East Boston deserves mitigation for these miscalculated growth projections now, and going forward if these trends continue.
- In 2107, Logan Airport pumped out 58,000 lbs of pollution a day, 21 million lbs for the year.
- A 2014 Logan Airport study showed that East Boston children living in highly impacted areas see a 360% increase in asthmatic symptoms, and adults see a 200% increase in COPD symptoms.

From: Czepiga, Page (EEA) on behalf of MEPA (EEA)
To: Canaday, Anne (EEA)
Subject: Fwd: public comments on Boston Logan International Airport 2018/2019 Logan Airport Environmental Data Report
Date: Friday, March 12, 2021 4:56:51 PM

Get Outlook for iOS

From: David Matheu <dmmatheu@gmail.com>
Sent: Friday, March 12, 2021 4:49:40 PM
To: MEPA (EEA) <mepa@mass.gov>
Subject: public comments on Boston Logan International Airport 2018/2019 Logan Airport Environmental Data Report

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Dear MEPA,

My name is David Matheu and I live at
59 Everett St, Arlington, MA 02474

I am writing to file a public comments on the Logan Airport 2018/2019 Environmental Data Report:

1. While the report claims that Massport cares about aircraft noise pollution, it declines to address the 100X increase in noise complaints filed with the airport since 2013 -- the introduction of RNAV/NextGen. This is a gross omission that allows Massport to downplay the problem. 18-1

2. While the report claims Massport tries to minimize overland/maximize over-water departures, the reality is that use of overland runway 33L is significantly increasing as a percentage of overall departures over the years of the report. This behavior has a major impact on noise. Reasons for this behavior aren't given. MEPA should not allow Massport to make such a claim when their behavior is the opposite of what they say. 18-2

3. Massport claims they wish to minimize aircraft noise and be a good neighbor. But over the period of the report, they continue to pay landing fees -- bonuses, essentially -- for landing new flights at night or in the early morning (5 to 6 AM) hours. This contradicts their claim and MEPA should demand an explanation -- this is a choice Massport makes, not the FAA. 18-3

4. Massport claims they employ a nominally quieter aircraft fleet. While probably technically true, this benefit is erased by the FAA's hyper-concentration of flightpaths through the disastrous, air-pollution-increasing NextGen program, because that program went with increased flight capacity and increased total noise and particulate pollution. 18-4

Please don't allow Massport executives to be deceptive about the noise and particulate pollution their behavior and choices actually bring about. By wrongly accepting the 2017

report, the secretary let them say a lot of things that weren't true in the 2017 report. MEPA can make the world a better place by checking Massport's behavior now. Please do so. Please check Massport's behavior in the unbounded increase in aircraft noise pollution they've heaped on so many.

Thank you
Dave Matheu

From: Tania Castro-Daunais
To: Canaday, Anne (EEA); MEPA (EEA)
Subject: My Public Comment for Boston Logan International Airport 2018/2019 Environmental Data Report
Date: Friday, March 12, 2021 5:05:03 PM

To the MEPA review board,

I am a resident of East Boston, and am calling for collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections (off by 300%) and subsequent rise in pollutants including Nitrous Oxides and Carbon Monoxide, as shown in the latest EDR. 19-1

We know that Massport has suffered major financial losses during COVID. However, the residents of East Boston continue to have long-term health implications: a 360% increase in childhood asthma, and 200% increase in adult COPD. These health implications have affected our community even more this year, as East Boston experienced the highest COVID rates in Boston. As a Harvard T.H. Chan School of Public Health study outlined, people exposed to higher levels of ultrafine particulate matter saw an 8% increase in COVID mortality.

“Many of the pre-existing conditions that increase the risk of death in those with COVID-19” [cardiovascular and respiratory diseases like asthma and COPD] “are the same diseases that are affected by long-term exposure to air pollution.” They found “statistically significant evidence that an increase of 1 g/m3 in long-term PM2. 5 exposure is associated with an 8% increase in the COVID-19 mortality rate.”

As a community, we welcome collaboration and conversation on how Massport and East Boston’s families can co-exist in healthier ways. HEPA filters placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing. 19-2

Let's be on the right side of history in caring for highly polluted neighborhoods, especially environmental justice communities who are predominantly families of color and overwhelmingly bear the brunt of health effects caused by air pollution.

Thank you for your consideration,
Tania Castro-Daunais

tania.gomes.castro@gmail.com
508.287.1887

This Page Intentionally Left Blank.

From: Carol Walker
To: Canaday, Anne (EEA)
Subject: Public Comment for Boston Logan International Airport 2018/2019 Environmental Data Report
Date: Monday, March 15, 2021 4:43:49 PM

To the MEPA review board,

I am a mother and resident of Winthrop, and am calling for collaboration between Massport and Winthrop and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections and subsequent rise in pollutants including Nitrous Oxides and Carbon Monoxide, as shown in the latest EDR. 20-1

We know that Massport has suffered major financial losses during COVID. However, the residents in our communities very close to the airport continue to have long-term health implications: a 360% increase in childhood asthma, and 200% increase in adult COPD. These health implications have affected our communities even more this year; East Boston has experienced the highest COVID rates in Boston. As a Harvard T.H. Chan School of Public Health study outlined, people exposed to higher levels of ultrafine particulate matter saw an 8% increase in COVID mortality.

“Many of the pre-existing conditions that increase the risk of death in those with COVID-19” [cardiovascular and respiratory diseases like asthma and COPD] “are the same diseases that are affected by long-term exposure to air pollution.” They found “statistically significant evidence that an increase of 1 g/m3 in long-term PM2. 5 exposure is associated with an 8% increase in the **COVID**-19 **mortality** rate.”

When discussing reopening of schools, we have to choose whether or not to open the windows and expose our children to outdoor pollution, or ventilate for COVID. A working mom in the area told me she’d had to give up her job because she couldn’t work at home, and was fearful of her asthmatic son retracting COVID at daycare.

As a community, we welcome collaboration and conversation on how Massport and our nearby communities’ families can co-exist in healthier ways. HEPA filters placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing. 20-2

Let's be on the right side of history in caring for highly polluted neighborhoods, especially environmental justice communities who are predominantly families of color.

Thank you for your consideration,
Carol Walker
carwalker58@gmail.com
617-846-3608

This Page Intentionally Left Blank.

From: Czepiga, Page (EEA) on behalf of MEPA (EEA)
To: Canaday, Anne (EEA)
Subject: Fw: EEA#3247 attention MEPA unit
Date: Monday, March 15, 2021 6:16:43 PM

From: Schwalbert, Nick (EEA) <nick.schwalbert@mass.gov> on behalf of internet, env (EEA) <env.internet@mass.gov>
Sent: Monday, March 15, 2021 5:18 PM
To: MEPA (EEA) <mepa@mass.gov>
Subject: Fwd: EEA#3247 attention MEPA unit

FYI

From: Frederick P Salvucci <salvucci@mit.edu>
Sent: Monday, March 15, 2021 5:00 PM
To: internet, env (EEA)
Subject: EEA#3247 attention MEPA unit

CAUTION: This email originated from a sender outside of the Commonwealth of Massachusetts mail system. Do not click on links or open attachments unless you recognize the sender and know the content is safe.

Dear Secretary Theoharides

I am hoping that you will accept this brief comment on the very inadequate environmental Report of Massport, and require that Massport prepare a much more thorough report for public review, and for your own review.

Decades ago, Massport became a champion of environmental mitigation of the adverse impact of its activities upon the largely low and moderate income neighbors, particularly in EastBoston, Revere, and Chelsea. Unfortunately more recently Massport has chosen to coast upon its earlier actions, and has adopted a reactive approach, implying that it is appropriate to act to mitigate adverse impact only after the impact has occurred, and been documented. This approach leads to a substantial lag in time during which adverse health impacts on the surrounding community residents, and upon Massport workers have already done significant damage. Even worse, this reactive approach is also based on lowball estimates of the growth that should be reasonably expected, so residents and workers are suffering from a double penalty.

The extensive comments filed with you by AIR Inc last week have provided detailed analysis of the deficiencies in the latest Massport Report.

I urge that you consider a simpler, and more effective standard for Massport to be held accountable for.
I suggest that there should be identified a maximum environmental footprint that humans should be exposed to at the airport and in surrounding neighborhoods, which have been exceeded for decades

21-1

in terms of noise and air pollution impacts as experienced by the worker and neighboring populations, and require mitigation not only reactively based upon how much worse conditions have become, which is certainly a sensible non degradation standard, but also in comparison to any excesses over reasonable standards that have already existed for some time. (essentially a belt and suspenders approach to achieve both reasonable standards where they do not exist, and non degradation standards, whichever standard is better for human health. 21-1

I further urge that there should be a « build it back better »approach, as called for by President Biden. The temporary downturn in aviation activity caused by Covid has created an opportunity to pre- empt the worsening of conditions by adopting strategies now to lower impact. This should certainly be feasible by increasing the capacity, and decreasing the price of Logan Express services to preempt the return of severe congestion at Logan. This should be complemented by the long delayed completion of the Blue to Red connector , a transit improvement that was to have been in place by 2010 under DEP regulations accepted by Massport and Massdot as part of the Big Dig, but is not yet even under construction. It should be further supplemented by an aggressive exit fee on all automobiles exiting the roadway system and entering the capacity constrained Logan circulation system, to guard against the return of gridlock both within the airport and. In the approach regional roads which were caused by the pernicious growth in UBER access, pre Covid.which caused a tragedy of the commons impact on all road users by undermining transit access and Logan Express access as preferred modes. 21-2 21-3 21-4

Thé substantial revenue potential of such an exit fee could fund both Logan .express, Transit improvement, and other public health mitigation efforts.

Massport, unique among Massachusetts public agencies is still enjoying very robust fiscal strength, which should be used to pay for the mitigation of the adverse environmental impact of its activities. Moreover, the recently signed Covid relief act included very substantial subsidies to shore up the finances of the aviation industry.

Massport is a public agency with obligations to the health of its workers and neighbors, and should be using its unusual strength to properly mitigate the impacts of aviation and ground access to support it from landing fees and roadway access fees, so that aviation can grow back in a much more sustainable manner.

I urge you to reject the .Massport report as inadequate, and order Massport to prepare a much more fundamental report based on the belt and suspenders approach outlined above.

Frederick Salvucci,
Former .secretary If Transportation of Massachusetts,
Currently at MIT in the Mobility project within DUSP

Sent from my iPad

MASSACHUSETTS SIERRA CLUB
50 Federal Street, 3rd floor
Boston MA 02110
(617) 423-5775
www.sierraclubmass.org

March 12, 2021

Re: Logan Airport 2018 / 2019 Environmental Data Report (EDR) EEA# 3247

Dear Secretary Theoharides:

The Massachusetts Chapter of the Sierra Club has been actively supporting sustainable transportation throughout the Commonwealth. We would like to submit the following comments regarding the Logan Airport Report.

Logan is a high-volume urban airport in a constrained location. Continued growth can only negatively impact the neighboring communities. Therefore, we call on MassDOT, EEA and Massport to develop plans that explore directing flights to other Massport airports or even other modes (because other modes are less polluting). For example, could Massport consider strategies to reduce the number of flights to the New York City regional airports or other destinations that are well served by rail and bus (as higher-speed rail is developed)? Or redirecting freight or private jets to other airports? Or increasing landing fees to not only mitigate the airport's community impacts but also disincentive short-haul flights?

The remainder of our comments addresses the more specific areas of the report.

A. Ground Transportation:

These proposals will reduce pollution, congestion and noise:

- We strongly recommend that the Massport eliminate CNG buses and other equipment. This fuel harms the environment and offers no meaningful environmental benefits over gasoline and may be worse for accident risks particularly at refueling stations. 22-1
- The interim 2030 Clean Energy and Climate Plan (CECP) identifies electrification as a critical piece to reduce transportation emissions and meet our climate goals. Massport should commit to 100% and interim targets for electrification of all Logan ground equipment starting with on-airport shuttle buses, drayage trucks and forklifts. Electric GSE will also reduce ground workers exposure to combustion pollutants. 22-2
- Massport should expand routes served by the Logan Express to help reduce congestion and commit to electrification of all Logan Express buses by 2025. Massport should make use of the recently announced MOR-EV Truck rebate to procure electric medium-and heavy-duty vehicles and the MassEVIP subsidies for state agencies to install charging infrastructure. 22-3
- We urge Massport and the Department to strongly support the Blue-Red Line connector, which will increase the number of passenger and worker trips to Logan via transit. This topic should be included in the Report. Similarly the Sliver Line Underpass at D Street would improve that route. 22-4

MASSACHUSETTS SIERRA CLUB
50 Federal Street, 3rd floor
Boston MA 02110
(617) 423-5775
www.sierraclubmass.org

- It is disappointing that the 2020 procurement of 45 buses for the Silverline included polluting diesel-hybrid buses that will continue to contribute to air pollution levels in East Boston, an environmental justice community, for at least 12 years if not more. Massport should work with the MBTA to ensure that the next bus procurements for the Silverline are fully electric. 22-5
- Massport needs to make Logan Express and MBTA services more efficient and attractive in order to shift traffic from private vehicles. 22-6
    - Massport needs to support dedicated bus lanes on the roadways to Logan
    - Continue to incentivize passengers (e.g., security line prioritization) who use the Express bus service.
    - Logan Express fares should lowered or free if it increases volumes away from private vehicles. Airport workers should have free MBTA bus/subway passes.
- Expand electric vehicle charging infrastructure at Logan airport, Massport office and all garages. 22-7
- We would like to see passengers and workers who use plug-in EVs be given incentives such as preferential parking locations and reduced ground access fees. This includes private vehicles, taxis and TNCs. With many people working at or using Logan Airport facilities, there exists an opportunity for Massport to engage employees, passengers and the surrounding community on EVs through fun educational events, vehicle test drives, and information booths. 22-8

B. Safety:

- Fire-fighting foams that use PFAS are not mentioned in the report but should be. These are used not just for equipment fires but also in suppression systems for the fuel storage tanks that abut the airport. These foams need to be eliminated now. We urge you to work with Federal agencies to research and allow non-PFAS options at airports. 22-9
- Past use of PFAS foams should be documented and mitigation plans developed as needed for sources such as runoff and groundwater. 22-10

C. Pollution:

- We commend the inclusion of ultrafine particles as a topic. However, the reduction or mitigation of this pollution is not discussed. While standards do not exist, Massport should be proactive about measuring and reducing this type of pollution. 22-11
- The Sierra Club supports nighttime flying restrictions. People and habitats need hours when there are *no* flights scheduled. We call on Massport to pilot and evaluate such a program. 22-12
- Light pollution is not mentioned at all but should be. The entire campus should be surveyed for dark skies compliance and a plan developed to reach conformity. This might create opportunities reduce lighting and energy consumption but more importantly will help with habitat protection particularly for birds and insects. 22-13
- Work more closely with residents and governments of neighboring communities, especially East Boston, to aggressively mitigate air pollution (e.g., filtration) and noise. Massport should work with the surrounding cities to prioritize municipal buildings serving 22-14

MASSACHUSETTS
SIERRA
CLUB
50 Federal Street, 3rd floor
Boston MA 02110
(617) 423-5775
www.sierraclubmass.org

children such as schools, libraries, community health and recreation facilities, and public housing. We need to protect children from asthma and COPD. 22-14

- Develop a plan to measure and reduce acute noise events, which can be more disruptive especially during nighttime sleeping hours. 22-15

Please let us know if you have any comments or questions.

Respectfully,

Deb Pasternak
Mass. Sierra Club, Chapter Director
deb.pasternak@sierraclub.org

cc: Jamey L. Tesler, Acting Secretary of Transportation

This Page Intentionally Left Blank.

Responses to Comment Letters

This Page Intentionally Left Blank.

Comment #	Author	Topic	Comment	Response
1-1	Representative Adrian Madaro	Airport operations	However, as we look to the future through this EDR process, it is important to keep in mind that such reductions are temporary... Able to anticipate the return of pre-2020 air traffic rates, as well as pre-2020 growth rates, Massport must be proactively planning for increased operations in the near future so as not to return to inadequate levels of planning, infrastructure, and mitigation to offset the true effects of rapid expansion.	Chapter 2, *Activity Levels*, of the *2020/2021 Environmental Data Report (EDR)* describes methodology for future forecasting planned for the *2022 Environmental Status and Planning Report (* ESPR) to account for impacts of the COVID-19 pandemic. The *2022 ESPR* will model future conditions, based on the updated forecast activity levels. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-peak pandemic growth trends for activity levels.
1-2	Representative Adrian Madaro	EJ/Mitigation	EDR 2018/2019 must provide a roadmap to "build back better" in the wake of the coronavirus, providing better consideration of the effects of the Airport on neighboring environmental justice communities, better understanding of the Airport's impacts on these communities through a revised health study and real-time air monitoring, and increased mitigation of these effects through programs such as soundproofing and air filtration.	Massport has in place extensive noise and air emissions mitigation programs that benefits all communities but especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. These communities include environmental justice (EJ) populations. Noise mitigation measures includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, soundproofing to eligible residents, aircraft towing requirements, and noise abatement routes. Air quality and greenhouse gas emissions (GHG) reductions programs include an extensive alternative fuel program, a high-occupancy vehicle (HOV) program that reduces the number of single occupancy vehicle trips, conversion of ground service equipment to renewable energy sources and RideApp measures to reduce trips. In 2022, Massport released its Net Zero Roadmap, the goal of which is to reduce Massport Scope 1 and 2 GHG emissions to net zero by 2031 and enable its partners and tenants to reduce their Scope 3 emissions. See Chapter 6, *Noise Abatement,* and Chapter 7, *Air Quality/Emissions Reduction* for additional information on Massport's noise and air emissions reduction efforts. Massport continues to work with the Federal Aviation Administration (FAA), research institutions like MIT, and the Massport Community Advisory Committee (MCAC) to look for ways to reduce impacts and expand research including on ultrafine particles (UFP). Massport is also working with the East Boston Health Center to target health measures for vulnerable populations. The EDRs/ ESPRs provide cumulative snapshots of Logan Airport environmental impacts and inform the public on efforts to reduce those impacts. Mitigation efforts are related to project-specific mitigation which are the result of separate environmental processes that include extensive public outreach and input. Refer to Chapter 9, *Environmentally Beneficial Measures and Project Tracking Mitigation*, for more details. Massport continues to identify impacts to the community, including EJ populations surrounding Logan Airport, and has and will continue to evaluate opportunities to protect community health.

Comment #	Author	Topic	Comment	Response
1-3	Representative Adrian Madaro	Airport Operations	Massport has a long legacy, through its EDR and ESPR reports, of chronically underestimating growth rates. Flight operation and passenger level increases at Logan Airport averaged 3.15% over 2018 and 2019, almost triple Massport's 1.1% projected growth rate. Similarly, passenger volumes averaged 5.25% growth during this same period, 3.5 times the ESPR's projected growth rate of 1.5%. While Massport projected an estimated1.16 million additional passengers over these two years, the actual increase of passengers was about 4.15 million people. These massive miscalculations have deprived the community of the opportunity to meaningfully review the full extent of potential environmental impacts at Logan Airport and, critically, resulted in inadequate planning, infrastructure, and mitigation to offset the true effects of rapid expansion.	As part of the EDR/ESPR process, Massport is required to prepare periodic forecast updates. These updated forecasts allow for the review of local, national, and international aviation and economic trends in an effort to provide the most relevant data at the time of document filing. With all forecasts, these are based on best available information and subject to change. As is evidenced by the ongoing COVID-19 pandemic, any forecast can be altered drastically and without warning in ways that can cause rapid increases or decreases in aircraft operations and passenger activity levels. The *2020/2021 EDR* provides updated statistics on Logan Airport's operations and demand, and includes trends on industry developments. This includes updates since the COVID-19 pandemic and the substantial impact on the aviation industry. Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for effects of the COVID-19 pandemic.
1-4	Representative Adrian Madaro	Airport Operations/COVID	The 2018/2019 EDR must ensure that Massport is ready for a quick recovery of passenger levels and growth rates and that adequate measures are in place to mitigate these increases.	As part of the EDR/ESPR process, Massport is required to prepare periodic forecast updates. These updated forecasts allow for the review of local, national, and international aviation and economic trends in an effort to provide the most relevant data at the time of document filing. With all forecasts, these are based on best available information and subject to change. As is evidenced by the ongoing COVID-19 pandemic, any forecast can be altered drastically and without warning in ways that can cause rapid increases or decreases in aircraft operations and passenger activity levels. At the time of this filing, Logan Airport was recovering from levels not seen since the 1970s. As a result, there are far fewer aircraft operations and passengers and a dramatic drop in overall Logan Airport activity. While activity levels are rebounding, national and international aviation activity forecasts suggest a several year recovery to regain pre-COVID-19 conditions. As the longer-range impact of the pandemic become clearer, Massport will continue updating forecasts pertaining to the anticipated recovery. Chapter 2, *Activity Levels* , describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*, discusses planned mitigation. As Massport begins to better understand future passenger activity and aircraft operations trends, forthcoming EDRs/ESPRs will outline the continuing and evolving strategies to minimize operational and environmental impacts of Logan Airport operations.
1-5	Representative Adrian Madaro	Public Transit/COVID	As Logan Airport looks toward a recovery in operations from the coronavirus pandemic, Massport must prioritize a return to public transit and HOV to prevent a resurgence in traffic conditions.	The results of the *2019 Logan International Airport Air Passenger Ground-Access Survey* informed the HOV and ground access strategy as described in Chapter 5, *Ground Access to and from Logan Airport* . This tool is used on an ongoing basis to adapt to the changes associated with the pandemic and the resultant passenger demands for airport access. In spring 2022, a new Logan Air Passenger Ground-Access Survey was conducted to help Massport understand changing travel patterns. The next filing in this process will provide an overview of the survey and ways the new data are being used.

Comment #	Author	Topic	Comment	Response
1-6	Representative Adrian Madaro	Airport Operations/COVID	As we pursue solutions to these congestion issues, it is essential that we have accurate estimates of Logan Airport rate of recovery from the coronavirus pandemic as well as future growth so that these increases can be accounted for in planning the future of our transportation system.	As part of the EDR/ESPR process, Massport is required to prepare periodic forecast updates. These updated forecasts allow for the review of local, national, and international aviation and economic trends in an effort to provide the most relevant data at the time of document filing. While passenger levels reached a new milestone in 2019, in March 2020, flights in and out of Logan Airport were dramatically reduced and passenger levels dropped by over 90 percent at the peak of the COVID-19 pandemic in the spring and summer of 2020. While recovery is occurring through 2021, the timeline for a return to recent levels is not yet known. The *2020/2021 EDR* provides the best available information. Chapter 2, *Activity Levels* , describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize those community impacts. Massport has multiple projects to address congestion issues, including the RideApp management plan and Logan Express utilization. Chapter 3, *Airport Planning* , and Chapter 5, *Ground Access to and from Logan Airport* , provide more information. In spring 2022, a new Logan Air Passenger Ground-Access Survey was conducted to help Massport understand changing travel patterns. The next filing in this process will provide an overview of the survey and ways the new data are being used.
1-7	Representative Adrian Madaro	Public Transit	A number of long-term transit infrastructure improvements would be beneficial to decreasing the traffic footprint caused by Logan Airport, and its subsequent burdens both on Logan's passengers and the region as a whole. Investments to the Blue Line, including signal upgrades and the construction of the Red Line-Blue Line connector, would allow for increased capacity and frequency going toward downtown, as well as providing a direct connection to important economic corridors along the Red Line. Construction of a Silver Line Underpass at D Street would allow the Silver Line to operate more efficiently and bypass some of the traffic issues it currently faces.	Massport evaluated a potential connection between the Massachusetts Bay Transportation Authority (MBTA) Red Line and Blue Line in the Environmental Assessment (EA)/Environmental Impact Report (EIR) for the Terminal E Modernization Project. The assessment included an analysis of the existing capacity on the Blue Line. A review of ridership and transit capacity on the Blue Line indicated that there is significant reserve capacity (passenger space available within the transit) remaining on the Blue Line during the peak hour in the peak direction. Even with a doubling of Blue Line use by air passengers, there is still significant Blue Line capacity available. Massport will continue to work with MBTA on the status and the potential design of the pedestrian connector to the Blue Line at Airport Station and ways to improve Silver Line operations to the Airport.
1-8	Representative Adrian Madaro	Public transit	The ESPR would also be enhanced by further discussion and analysis of the impacts of high-speed rail and water transportation projects, as well as Airport regionalization strategies and the potential effects of Airport ground access fees. These projects, while important, are not presently considered under the EDR.	The *2020/2021 EDR* analyzes and reports performance in HOV mode share, parking demand, and other ground access and air quality statistics under the existing EDR/ESPR process. Massport continues to look at ways to improve HOV access to the Airport, including working with various state agencies on regional transportation solutions to enhance HOV options. As part of the Massachusetts Department of Environmental Protection (MassDEP) approval of an amendment to the Logan Airport Parking Freeze for 5,000 additional on-airport spaces, Massport was required to conduct a number of ground access studies including measures to improve HOV access to Logan Airport. These studies were published in 2019 and can be found on the Massport website. The studies evaluated and addressed several regional access strategies including additional Logan Airport Express sites, water transportation projects, and pricing.

Comment #	Author	Topic	Comment	Response
1-9	Representative Adrian Madaro	Public Tansit	In the wake of the pandemic, Massport cannot continue to look only at on-campus solutions to transit issues exacerbated by Logan operations, which have permeated well beyond the confines of their borders. Massport should examine how they can contribute to the realization of these regional improvements in conjunction with MassDOT, the MBTA, and other relevant stakeholders.	In addition to evaluating opportunities to enhance and upgrade its Logan Express satellite bus network, Massport regularly meets with MBTA and MassDOT to discuss area ground access strategies. This had led to improvements in the Silver Line - including commitments for partnering with MBTA on replacement Silver Line buses, coordinating on SL3 bus activities in and around the MBTA Blue Line Airport Station and other bus route improvements. The MassDOT Secretary sits on the Massport Board, furthering enhancing those partnerships.
1-10	Representative Adrian Madaro	Transit	The reconfiguration of pick-up and drop-off facilities for TNCs at Logan Airport, implemented shortly before the pandemic, was a good first step toward making the rideshare system more efficient and reducing deadhead trips. While there was not much time to evaluate its effects before pandemic-related travel restrictions began, Massport should continue to monitor and make improvements to this system so that a resurgence in TNC ridership to the Airport does not mean a return to pre-pandemic traffic issues.	Massport continues to evaluate RideApp activity and work with the companies and drivers to improve efficiency and minimize impacts while providing a high quality experience for our customers. We will continue to look at opportunities to shift drop-off/pick-up activity to HOV modes and acknowledge the local and regional benefits of doing so. Chapter 5, *Ground Access to and from Logan Airport* presents this information, as available. Air traffic and passenger activity levels have been significantly affected by concerns related to the COVID-19 pandemic. Within that context, Massport continues to evaluate and plan for the recovery of air passenger activity and remains committed to implementing the broad range of ground access strategies that are outlined throughout the chapter. The schedule for those improvements will be adjusted according to the current conditions. As of December 2019, Massport relocated most RideApp drop-off/pick-up activity to the ground floor of the Central Parking Garage complex, with the exception of drop-off at terminal curbs during the 4:00 AM to 10:00 AM peak departure period. Massport has plans to implement a second urban Logan Express service at North Station with buses that were procured in 2020, but due to COVID-19, this new service has been deferred. Details of the 2020 and 2021 vehicle miles traveled (VMT) modeling results are presented in Chapter 5, *Ground Access to and from Logan Airport* , and Appendix G.
1-11	Representative Adrian Madaro	Transit	Massport must anticipate a resurgence in travel with restored and robust Logan Express options. Like with public transit, levels of availability must pre-empt a rise in ridership, to provide adequate capacity and promote the service as an attractive, convenient option to deter riders from single-occupancy vehicle and TNC usage. Massport must engage in a campaign to promote the public health, safety, and efficiency of HOV options such as Logan Express for passengers returning to the air post-pandemic.	Massport has restored much of the Logan Express service that were temporarily reduced in March 2020. In addition, Massport has relocated the underperforming Peabody service to a location at the North Shore Mall that has much better access; we expect this location to help rebuild and expand HOV ridership from the north. While a new North Station urban location is still on hold, Massport continues to evaluate other urban and suburban locations. Massport reopened the Back Bay Logan Express service in October 2022.

Comment #	Author	Topic	Comment	Response
1-12	Representative Adrian Madaro	Noise/Air Quality	Massport should take responsibility for increasing noise abatement and pollution control measures to a magnitude at least equal to that of current and planned expansions.	Current Logan Airport noise abatement procedures include higher shoreline crossings, noise abatement turns, and late night runway preferences to reduce flights over densely populated areas and increase over the water flights when possible. The Area Navigation (RNAV) Study is based on a Memorandum of Understanding (MOU) between FAA and Massport committing both organizations to look for opportunities to reduce impacts stemming from FAA's NextGen modernization for the air space system. This is a unique, innovative program with technical work being performed by MIT as independent experts. The study began in 2017 and continues with ideas to increase over the water procedures and reduce flight concentration. Massport has been receiving input from the public and the MCAC, which includes representatives from Boston communities, on a regular basis and continues to work on looking for measures to reduce overflight noise. In December 2021, the MCAC put forth one of the additional procedures for further study and implementation by FAA. Massport and MIT completed the RNAV study at the end of 2021. As part of the Boston Logan Airport Noise Study (BLANS), the Logan Airport Community Advisory Committee (CAC) chose not to pursue a new PRAS and could not come to agreement given the difficult discussion related to sharing of overflight noise. Massport will collaborate with MCAC (legislated advisory committee to Massport and superseded the Logan Airport CAC) if it chooses to undertake a new PRAS effort.
1-13	Representative Adrian Madaro	Noise	Updating the Preferential Runway Advisory System (PRAS) is essential to regional noise mitigation, and would be an effective component of this document's evaluation.	See response to comment 1-12.
1-14	Representative Adrian Madaro	Noise	Additionally, decreasing the impact of nighttime flights by diverting activity to overwater air traffic corridors should be vigorously pursued.	See response to comment 1-12.
1-15	Representative Adrian Madaro	Noise	Massport should also explore all legal and logistical pathways to imposing increased landing fees on nighttime flights. Schools within the 60 DNL contour, and within the 65 DNL contour in particular, should receive increased soundproofing assistance in order to protect from the exceptional amount of excess noise pollution caused by aircraft operations.	See response to comment 1-12.
1-16	Representative Adrian Madaro	Noise/Air Quality	It is critical that the widespread effects of noise pollution are thoroughly mitigated as noise contours continue to adjust and, in places like East Boston, intensify in densely populated areas. Increased ground access and airfield activity are also responsible for rising emissions of pollutants such as NOx, ultrafine particulates, and other gases and particulate matter.	See response to comment 1-12.

Comment #	Author	Topic	Comment	Response
1-17	Representative Adrian Madaro	Mitigation (Air Quality)	It is of vital importance that Massport take steps to mitigate these harmful emissions directly and effectively. The long-term benefits of the emissions reduction strategies outlined in the 2018/2019 EDR are an important part of this mitigation and must be rigorously pursued.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Air quality and GHG emissions reductions programs include an extensive alternative fuel program, an HOV program that reduces the number of Airport users driving to the Airport, and conversion of ground service equipment to renewable energy sources. In 2021, Massport prepared the Net Zero Roadmap, the goal of which is to reduce Massport GHG emissions to net zero by 2031. Massport has/is also cooperating with Boston University, Tufts University, and other researchers in identifying aircraft-specific related UFPs in an urban environment with non-airport related sources. This research is underway in the East Boston area and Massport continues to contribute by providing Logan Airport operational and other pertinent data.
1-18	Representative Adrian Madaro	Mitigation (Air Quality)	However, surrounding communities continue to be impacted by harmful concentrations of pollutants as a result of Airport activity. Recent research by Olin College and Tufts University further indicate that such pollutant concentrations largely persist in indoor environments. Therefore, an important part of mitigation must be indoor air filtration strategies in residences, community spaces, and schools, which have shown effectiveness in reducing concentrations of pollutants in these spaces Massport should begin this mitigation by providing and maintaining HEPA air purifiers to schools within a 2-mile radius of Logan Airport. As students across the Commonwealth begin to return to the classroom, these HEPA air purifiers will provide substantial pollution-reduction benefits in spaces where our children spend a substantial part of their daily lives, engaged in classes, sports, and extracurricular activities. These benefits have the potential to mitigate many of the proven health risks developed during childhood as a result of long-term exposure to these pollutants. School-based HEPA air filtration mitigation offers an important opportunity to address high rates of childhood asthma Nd other illnesses, and as such, Massport must not hesitate to provide them.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Air quality and GHG emissions reductions programs include an extensive alternative fuel program, an HOV program that reduces the number of Airport users driving to the Airport, and conversion of ground service equipment to renewable energy sources. In 2021, Massport prepared the Net Zero Roadmap, the goal of which is to reduce Massport GHG emissions to net zero by 2031. Chapter 7, *Air Quality/Emissions Reduction*, provides an update on its ongoing collaboration and evolving service strategy with the Massachusetts Department of Public Health (DPH) and East Boston Health Center. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.

Comment #	Author	Topic	Comment	Response
1-19	Representative Adrian Madaro	Health	Additionally, a revised Logan Airport Health Study would be beneficial in helping to better understand the effects of this pollution, and better define their specific relationship to health impacts. While the original Airport Health Study, released in 2014, achieved many important objectives, such as focusing on nearby communities, establishing enhanced incidents of asthma endcap, there is still much more work to be done to fully understand the impacts of Logan Airport on the health of neighboring communities. A revised health study, with proper funding and conducted in a more timely manner, focused on establishing associations with pollutant levels, improved spatial resolution, and time exposure activity analysis, should be conducted in collaboration with Massport to better understand these effects.	Chapter 7, *Air Quality/Emissions Reduction* provides updated information regarding recent and ongoing scientific studies associated with airport emissions including the *Logan Airport Health Study* by Massachusetts Department of Health (2014), *Impacts of Aviation Emissions on Near-Airport Residential Air Quality* by Tufts University (2020), and similar airport-related health studies by the University of Southern California and University of Washington. The findings show key differences exist in the particle size distribution and the black carbon concentration for roadway and aircraft features. Massport will continue to evaluate opportunities to update health impact data and documents.
1-20	Representative Adrian Madaro	Air Quality	Finally, it is important to fully and comprehensively understand the specific community-level impacts of pollutants from Logan Airport. The only practical way to gain this knowledge is through physical monitoring of air pollution throughout the community. This is why Massport must engage in the installation of a network of air quality monitoring stations throughout the Airport host communities of East Boston and Winthrop. This air quality monitoring network should measure key pollutants in the neighborhood, providing this data real-time on publicly accessible apps to neighborhood residents to help them fully understand the relevant health impacts. The portfolio of pollutants measured should include, among others, ultrafine particulates. As an increasing body of knowledge points to the health risks of UFPs, preliminary studies conducted near Logan Airport have suggested high concentrations of UFPs as a result of Airport activity, making such monitoring essential. Such physical monitoring is an important counterpart to pollutant monitoring, and data collected from such should be a foundational aspect of future EDR reports.	Olin College is collaborating with Air Inc. and the Town of Winthrop to monitor air quality in the community. Monitors were placed in Winthrop to continuously measure pollutants such as carbon monoxide (CO), carbon dioxide (CO_2) nitric oxide (NO), nitrogen dioxide (NO_2) and ozone (O_3) as well as the mass concentration of particulate matter ($PM_{2.5/10}$), and all relevant meteorological conditions. The Olin College students are analyzing the monitoring data. Massport has provided operational data on request and will continue to collaborate when asked.

Comment #	Author	Topic	Comment	Response
1-21	Representative Adrian Madaro	Mitigation	Massport must continue to meet its mitigation implementation commitments to proactively address the future environmental effects of pre-pandemic levels of air traffic and to accurately alleviate conditions in already burdened environmental justice communities.	Massport has in place an extensive noise and air emissions mitigation program that benefits all communities but especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. These communities include EJ areas. Mitigation measures includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, soundproofing to eligible residents, aircraft towing requirements, and noise abatement turns. Air quality and GHG emissions reductions programs include an extensive alternative fuel program, an HOV program that reduces the number of Airport users driving to the Airport, and conversion of ground service equipment to renewable energy sources. In 2022, Massport released its Net Zero Roadmap, the goal of which is to reduce Massport GHG emissions to net zero by 2031. Massport continues to work with FAA, research institutions like MIT, and the MCAC, to look for ways to reduce impacts and expand research including on UFPs. Massport is also working with the East Boston Health Center to target health measures for vulnerable populations. The EDRs/ESPRs provide cumulative snapshots of Logan Airport's environmental impacts and inform the public on efforts to reduce those impacts. Mitigation efforts are related to project-specific mitigation which are the result of separate environmental processes that include extensive public outreach and input. Refer to Chapter 9, *Environmentally Beneficial Measures and Project Tracking Mitigation* , for more details. Massport continues to identify project-specific impacts to the community, including EJ populations surrounding Logan Airport, and has and will continue to evaluate opportunities to protect community health.
2-1	DOER	Energy Use/Emissions	When CHP is used, the building emissions picture is more complex. To assess this, as we've previously recommended, EDRs and ESPRs should also report the following: Space and water heating end use consumption should be estimated and broken down by heating which is provided by central plant steam versus heating provided by fossil-fuel fired (or other) equipment;	As part of its Roadmap to Net Zero by 2031, Massport has identified the Logan Central Heating Plant (CHP) as a key facility to begin transitioning away from fossil fuel. An engineering study on this effort is expected to commence in late 2022. Massport utilizes current grid emissions factors as they are updated and incorporates those into emissions reporting as necessary. Periodic updates to the emissions factors are incorporated into emissions calculations included in the EDRs/ESPRs. Massport currently produces over one million kilowatt hours of renewable energy from solar arrays at various locations across Massport properties. Additional comments on distributed renewable power generation are noted. Massport does and will continue to evaluate opportunities for distributed renewable energy production on a project-by-project basis.
2-2	DOER	Energy Use/Emissions	Similarly, space cooling end use consumption should be estimated and broken down by cooling from central plant produced chilled water versus cooling provided by other non-CHP means;	See response to comment 2-1.
2-3	DOER	Energy Use	CHP heating and cooling production efficiency and power production efficiency should be estimated.	See response to comment 2-1.

Comment #	Author	Topic	Comment	Response
2-4	DOER	Energy use	Once the above is estimated, the emissions of building space heating, space cooling, and service water heating can then be estimated. This analysis should be done using electric grid emissions of658 lbs./MWhr (for year 2021) and 200 lbs./MWhr (for year 2050) to provide a picture of current and future emissions footprints.	See response to comment 2-1.
2-5	DOER	Energy Use	When planning new construction and renovations, we recommend the following: 1. Prioritize building design and construction practices that result in low heating and cooling thermal energy demand intensity (heating and cooling "TEDI") 2. If new or renovated residential or hotel space is planned, pursue Passive house (ether PHIUS or PHI certifications.) 3. Pursue efficient electrification of space heating, including air-to-air (or VRF) and air-to-water heat pumps. Avoid use of CHP and on-site gas combustion for space heating. 4. Use efficient electrification of water heating wherever possible, including heat pump water heaters. 5. Set aside as much rooftop space for solar as possible, including for projects in which solar may not be built as part of initial project. 6. Prepare for ubiquitous electric vehicles with as much EV and EV ready parking spaces.	Massport does and will continue to evaluate opportunities for distributed renewable energy production on a project-by-project basis.
3-1	Town of Milton	Noise	We urge Massport and the FAA to use this period of respite to continue to consider the impacts noise and pollution has on your neighbors and customers.	Massport has in place an extensive noise and air emissions mitigation program that benefits all communities but especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Mitigation measures includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, soundproofing to eligible residents, aircraft towing requirements, and noise abatement turns. Massport continues to work with FAA, research institutions like MIT, and the MCAC, to look for ways to reduce impacts and expand research including on UFP. The EDRs/ESPRs report on a variety of metrics related to noise impacts including FAA approved day-night average sound level (DNL) metric as well as supplemental noise, runway use, and flight metrics. There is also substantial data by towns provided in the Chapter 6, *Noise Abatement* , and Appendix H. Chapter 7, *Air Quality/Emissions Reduction* , provides an update on this ongoing collaboration and evolving service strategy. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts.

Comment #	Author	Topic	Comment	Response
3-2	Town of Milton	Noise	We repeat the need for an analysis of the cumulative impacts from increasing numbers of RNAVs flown over surrounding communities. As discussed in numerous other comment letters, there are three RNAVs that overfly Milton, with two others proposed. Looking at these impacts in isolation does not provide an actual assessment of on-the-ground impacts – some of which are reflected in the increasing number of noise complaints filed in these communities. Neither the EDRs, the ESPRs, nor the proposed rulemaking for the 4L RNAV approach appropriately analyzes cumulative impacts – and such analysis is required by law.	Current Logan Airport noise abatement procedures include higher shoreline crossings, noise abatement turns and late night runway preferences to reduce flights over densely populated areas and increase over the water flights when possible. The RNAV Study is based on a MOU between FAA and Massport committing both organizations to look for opportunities to reduce impacts stemming from FAA's NextGen modernization for the air space system. This is a unique, innovative program with technical work being performed by MIT as independent experts. The study began in 2017 and continues with ideas to increase over the water procedures and reduce flight concentration. Massport has been receiving input from the public and the MCAC, which includes representatives from Boston communities, on a regular basis and continues to work on looking for measures to reduce overflight noise. In December 2021, the MCAC put forth one of the additional procedures for further study and implementation by FAA. Massport and MIT completed the RNAV study at the end of 2021. As part of the BLANS, the Logan Airport CAC chose not to pursue a new PRAS and could not come to agreement given the difficult discussion related to sharing of overflight noise. Massport will collaborate with MCAC (legislated advisory committee to Massport and superseded the Logan Airport CAC) if it chooses to undertake a new PRAS effort.
3-3	Town of Milton	Operations/Environmental Impacts	While not directly applicable to the EDR analysis, the same theory applies -- when analyzing the environmental impacts of Massport operations, the off-premises operations must be analyzed in toto, and not evaluated in separate boxes.	Massport continues to look for opportunities to reduce environmental impacts and provide mitigation commitments for its projects.
3-4	Town of Milton	Mitigation	We again request that the Secretary direct Massport and the EEA agencies, with the support of the MCAC, to promptly develop a system for the fair and equitable distribution of aircraft overflights that provides real relief to the highly impacted surrounding communities.	Massport has been receiving input from the public and the MCAC, which includes representatives from Boston communities, on a regular basis and continues to work on looking for measures to reduce overflight noise. As part of the BLANS, the Logan Airport CAC chose not to pursue a new PRAS and could not come to agreement given the difficult discussion related to sharing of overflight noise. Massport will collaborate with MCAC (legislated advisory committee to Massport and superseded the Logan Airport CAC) if it chooses to undertake a new PRAS effort.
3-5	Town of Milton	Noise	We urged, and we repeat this request- Massport and the Secretary must move to a more updated method for noise assessment using currently available noise measurements (e.g., N70, which focuses on the number of noise events greater than 70 dB(A) or Lmax) and either discontinue using the DNL standard, or supplement its use with these additional metrics.	The EDRs/ESPRs report on a variety of metrics related to noise impacts including FAA approved DNL metric as well as supplemental noise, runway use, and flight metrics. There is also substantial data by towns provided in the Chapter 6, *Noise Abatement*, and Appendix H.

Comment #	Author	Topic	Comment	Response
3-6	Town of Milton	Noise	Supplemental metrics (which already exist) lower the measurement threshold for particular hours (like overnight), or take into account the short interval between noise events, are necessary to make the noise and sound measurement real and useful, in working with impacted overflight communities. We urge the Secretary to require Massport to update its measurements to use these supplemental metrics, when evaluating the impacts of airplane noise on the communities surrounding Logan.	The *2020/2021 EDR* responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. Refer to Chapter 6, *Noise Abatement* for an update on runway use, flight tracks, aircraft operations and aircraft types, noise contours and the sound insulation program. The assessment follows FAA-required standards and methodology for noise impact assessment.
3-7	Town of Milton	Community Coordination	We continue to urge real and substantive collaboration between Massport, the Secretary, and the communities impacted by Logan overflights. Direct and regular access to Massport and the Secretary/all EEA agencies may help develop real and meaningful solutions to address the problems from airport operations –especially noise and pollution -- occurring in those communities.	The *2020/2021 EDR* responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. Massport has and will continue to consult with the EEA and other agencies to address environmental and community impacts.
3-8	Town of Milton	Noise	The 2018-2019 EDR continues to ignore the importance of noise annoyance as a factor of environmental impact and harm. It is outrageous that Massport virtually ignores these complaints in the 2018-2019 EDR, and still has no plan in place to address impacts on these citizens. The noise from Logan operations impacts citizens across boundaries, yet no one community is empowered to find a solution. Instead, we must turn to our leaders at the state level, including the EOEEA for oversight, empowerment, and solutions.	The *2020/2021 EDR* responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. Massport has and will continue to consult with the EEA and other agencies to address environmental and community impacts.

Comment #	Author	Topic	Comment	Response
3-9	Town of Milton	Noise	We repeat the request we made in our comments to the 2017 ESPR, which were not sufficiently addressed in Appendix 7 to the 2018-2019 EDR, that the Secretary work with the FAA, Massport, and Milton to implement late night aircraft restrictions, similar to those set forth in740 CMR 24.04, which are protective of Milton and its residents. In particular, it is important to discuss restrictions on RNAV usage and routes that overfly residential neighborhoods, including spreading the routes further so that the nighttime noise is less concentrated in residential neighborhoods, or moving routes over the ocean during certain periods of time.	The *2020/2021 EDR* responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. Massport has and will continue to consult with the EEA and other agencies to address environmental and community impacts. Current Logan Airport noise abatement procedures include higher shoreline crossings, noise abatement turns and late night runway preferences to reduce flights over densely populated areas and increase over the water flights when possible. These procedures benefit Boston and many nearby communities including the Town of Milton. The RNAV Study is based on a MOU between FAA and Massport committing both organizations to look for opportunities to reduce impacts stemming from FAA's NextGen modernization for the air space system. This is a unique, innovative program with technical work being performed by MIT as independent experts. The study began in 2017. The study assessed ideas to increase over the water procedures and reduce flight concentration. Massport has been receiving input from the public and the MCAC, which includes representatives from Boston communities, on a regular basis and continues to work on looking for measures to reduce overflight noise. In December 2021, the MCAC put forth one of the additional procedures for further study and implementation by FAA. Massport and MIT completed the RNAV study at the end of 2021. As part of the BLANS, the Logan Airport CAC chose not to pursue a new PRAS and could not come to agreement given the difficult discussion related to sharing of overflight noise. Massport will collaborate with MCAC (legislated advisory committee to Massport and superseded the Logan Airport CAC) if it chooses to undertake a new PRAS effort.
3-10	Town of Milton	Noise	Specifically, as there are already nighttime restrictions on arrivals to runway 4L, we request the same restrictions(no arrivals between 11:00 PM and 6:00 AM) for runway 4R.In addition, early-morning departures from runway 27 also routinely overfly Milton and the other communities under the runway 27 RNAV.	Noise restrictions to Runway 4L are related to departures, and there is currently no nighttime restriction for Runway 4L arrivals. However, Massport has nighttime-over-water preference procedure, to reduce and minimize noise impacts on nearby communities including the Town of Milton.
3-11	Town of Milton	Air Quality	Once again the 2018-2019 EDR only discusses air pollution from airport operations in the context of the actual operations of Logan airport, on Logan property We repeat our comments to the 2014 and 2015 EDRs, and the 2017 ESPR, that this perspective is overly and conveniently narrow. Recent studies at LAX (Hudda, et al., May 2014) found ultrafine particle (UFP) counts as far as ten miles from heavily used arrival runways.	The EDRs/ESPRs focus on Logan Airport's operations, plans, analysis and impacts. These reports use accepted industry practice to collect, report and analyze appropriate operational data and key environmental metrics related to aircraft activity, ground access, noise, air emissions, and other relevant information.

Comment #	Author	Topic	Comment	Response
3-12	Town of Milton	Noise/Air Quality	We repeat the request we made in our comments to the 2017 ESPR, which were not sufficiently addressed in Appendix 7 to the 2018-2019 EDR, that the Secretary direct Massport, in conjunction with the Department of Public Health ("DPH") and the Department of Environmental Protection ("DEP"), to conduct noise and air pollution studies in communities like Milton which receive a substantial number of low-flying arrival aircraft.	Chapter 7, *Air Quality/Emissions Reduction* provides updated information regarding recent and ongoing scientific studies associated with airport emissions including the *Logan Airport Health Study* by Massachusetts Department of Health (2014), *Impacts of Aviation Emissions on Near-Airport Residential Air Quality* by Tufts University (2020), and similar airport-related health studies by the University of Southern California and University of Washington. The findings show key differences exist in the particle size distribution and the black carbon concentration for roadway and aircraft features.
3-13	Town of Milton	Air Quality	We further request that the scope of the future EDRs be expanded to consider the health impacts from increased and concentrated arrival and departure operations due to RNAVs, and that pollution data be measured for every community under any of the many Logan RNAVs, and that no new RNAV overflight paths be put into use until such study is complete and all parties agree that no additional detrimental effects will be experienced by residents in communities bearing the brunt of low-flying airplane overflight.	The noise and air quality modeling conducted for the *2020/2021 EDR* considers the volume of aircraft operations and therefore the air quality modeling results account for any increases or decreases in the number of aircraft arrivals and departure operations. Noise modeling accounts for aircraft location and therefore reflects the concentration of noise impacts in the surrounding communities.
3-14	Town of Milton	Operations/Environmental Impacts	Direct Massport to prepare a Supplemental EDR which fully and realistically addresses projected increases to Logan operations and airport throughput, and the resulting environmental impacts;	Massport has prepared annual filings describing Logan Airport operating and environmental conditions since the 1970s. Throughout that period, in addition to the annual status reports (EDRs), Massport produces periodic (typically every 5-6 years) ESPR forecasts of projected passenger levels, aircraft operations, ground access trips, noise and emission impacts. As with all forecasts, they are based on best available information at the time and subject to change. A benefit of the EDR/ESPR process is that these forecasts must be regularly updated to reflect new information and combined with the environmental projections, help Massport develop strategies to continue to reduce community impacts from Logan Airport operations.
3-15	Town of Milton	Mitigation	Work with the FAA, Massport, and Milton to develop and implement late-night aircraft overflight restrictions which are protective of Milton and its residents, including consideration of an 11:00 PM to 6:00 AM landing prohibition on runway 4R;	The state legislature created the MCAC of which Milton is an active member. The MCAC includes over 30 communities. Massport believes that discussions related to limiting runways and use, and potential shifting of noise impacts, should be had with all communities. Also, there are federal regulations that severely limit an airport's ability to restrict use and access to users of the nation's airspace system.

Comment #	Author	Topic	Comment	Response
3-16	Town of Milton	Mitigation	Direct Massport and the MCAC to promptly develop a system for the fair and equitable distribution of aircraft overflights that provides real relief to the highly impacted surrounding communities, especially those that are under multiple RNAVs;	Massport has been receiving input from the public and the MCAC, which includes representatives from Boston communities, on a regular basis and continues to work on looking for measures to reduce overflight noise. As part of the BLANS, the Logan Airport CAC chose not to pursue a new PRAS and could not come to agreement given the difficult discussion related to sharing of overflight noise. Massport will collaborate with MCAC (legislated advisory committee to Massport and superseded the Logan Airport CAC) if it chooses to undertake a new PRAS effort.
3-17	Town of Milton	Noise/Air Quality	Direct Massport to collaborate with DPH and DEP to develop and conduct noise and air pollution studies in highly impacted surrounding communities, especially those that are under multiple RNAVs;	Chapter 7, *Air Quality/Emissions Reduction* provides updated information regarding recent and ongoing scientific studies associated with airport emissions including the *Logan Airport Health Study* by Massachusetts Department of Health (2014), *Impacts of Aviation Emissions on Near-Airport Residential Air Quality* by Tufts University (2020), and similar airport-related health studies by the University of Southern California and University of Washington. The findings show key differences exist in the particle size distribution and the black carbon concentration for roadway and aircraft features.
3-18	Town of Milton	Mitigation	Direct Massport to include all of the points made above in the scope of the 2018-2019EDR and in all future EDRs. This includes impacts to health from noise and pollution from: off-airport impacts of growth, cumulative impacts of RNAV overflights, increased nighttime operations, moving to updated noise measurements which are more protective of human health and which account for acute impacts more realistically than the DNL standard; and working directly with impacted communities to more fully understand and evaluate the human health effects from Logan operations.	The *2020/2021 EDR* responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. Refer to Chapter 6, *Noise Abatement* for an update on runway use, flight tracks, aircraft operations and aircraft types, noise contours and the sound insulation program. The assessment follows FAA-required standards and methodology for noise impact assessment.
3-19	Town of Milton	Noise	Direct Massport to utilize supplement metrics when measuring sound and annoyance from airplane overflights in Milton and all other communities.	The *2020/2021 EDR* responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. Refer to Chapter 6, *Noise Abatement* for an update on runway use, flight tracks, aircraft operations and aircraft types, noise contours and the sound insulation program. The assessment follows FAA-required standards and methodology for noise impact assessment.

Comment #	Author	Topic	Comment	Response
4-1	Conservation Law Foundation	Mitigation	Given that growth is a primary driver of public health and environmental impact, and consequently will determine the scale of Massport's obligations and opportunities to avoid, minimize, and mitigate environmental harm, CLF recommends that the Secretary's Certificate clarify reporting requirements, require additional air mitigation, specify transparent thresholds for deferred mitigation projects, and direct additional community engagement.	This *2020/2021 EDR* analyzes the continued growth in airport activity through 2021 and describes the community and environmental impacts of that activity. This EDR also provides initial consideration of the dramatic decline in Airport activity following the outbreak of COVID-19. Beginning in March 2020, flights in and out of Logan Airport were dramatically reduced and passenger levels dropped by over 90 percent at the peak of the pandemic in the spring and summer of 2020. By the end of 2020, passenger levels dropped to levels of activity not seen since the 1970s. As a result, there are fewer aircraft operations and passengers and a drop in overall Logan Airport activity. While activity levels were rebounding in 2021, national and international aviation activity forecasts continue to suggest a several year recovery to regain pre-COVID-19 conditions. As the longer-range impact of the pandemic become clearer, Massport expects to be able to present updated forecasts pertaining to the anticipated recovery. The *2020/2021 EDR* presents the best information at this time. The dramatic reduction in Logan Airport activity has also translated to a substantial reduction in community impacts. These initial impacts are analyzed in this *2020/2021 EDR* . As Massport begins to better understand future passenger activity and aircraft operations trends, forthcoming EDRs will outline the continuing and evolving strategies to minimize operational and environmental impacts of Logan Airport operations. While passenger numbers are beginning a slow recovery, there are far fewer passengers and employees traveling to and from Logan Airport and there is far less roadway congestion both in Boston and the metropolitan area. In addition, the public's interest in using HOV transportation services like buses, rapid transit and commuter rail, has also been significantly affected by concerns about COVID-19. Massport is committed to the CLF agreement and will continue to report on progress towards meeting those items, subject to current conditions.

Comment #	Author	Topic	Comment	Response
4-2	Conservation Law Foundation	Mitigation	Given these risks, it is critical that Massport continue its mitigation projects and provide clear thresholds for any deferrals, engage with residents and organizations from affected communities, and provide transparent and clear reporting of environmental impacts.	Massport has in place an extensive noise and air emissions mitigation program that benefits all communities but especially nearby communities including East Boston, Chelsea, Revere, South Boston and Winthrop. This includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, soundproofing to eligible residents, aircraft towing requirements, and noise abatement turns. Air quality and GHG emissions reductions programs include an extensive alternative fuel program, an HOV program that reduces the number of Airport users driving to the Airport, and conversion of ground service equipment to renewable energy sources. In 2021, Massport prepared the Net Zero Roadmap, the goal of which is to reduce Massport GHG emissions to net zero by 2031. Massport continues to work with FAA, research institutions like MIT, and the MCAC to look for ways to reduce impacts and expand research including on UFP. Massport also is working with the East Boston Health Center to target health measures for vulnerable populations. EDR/ESPRs provide cumulative snapshots of Logan Airport environmental impacts and inform the public on broad efforts to reduce impacts. Mitigation efforts are related to project-specific mitigation which are the result of separate environmental processes that include extensive public outreach and input. Where any measures were temporarily adjusted (primarily HOV service), these adjustment were tied directly to a drop in passenger activity and ridership. Despite a slow recovery, Massport has been aggressive in restoring/enhancing HOV services to ensure that reduced services are not a constrain to continued growth in HOV ridership. Some other commitments were directly tied to projects that have been deferred. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , and will continue to be refined as growth and activity levels increase.
4-3	Conservation Law Foundation	Business	CLF encourages Massport to be more exacting in its activities and transparent in its decision making.	In addition to regularly meeting with community groups and the Massport CAC regarding Airport and Authority-wide operations and impacts, Massport is the only state agency to conduct this unique EDR/ESPR process which is publicly noticed and formally reviewed through the MEPA process. For over 40 years, the EDR/ESPR (and their predecessors) have shared detailed Logan Airport-wide environmental analyses, projects status, upcoming projects information, and programs to respond to community issues.
4-4	Conservation Law Foundation	Airport Operations	We recommend that Massport clarify and refine its process for estimating growth rates and provide additional data.	Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-peak pandemic growth trends for activity levels.
4-5	Conservation Law Foundation	Forecasts	Massport should clarify the discrepancies between the 2018/2019 EDR and forecasted growth rates included in the 2017 ESPR.	Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-peak pandemic growth trends for activity levels. The next ESPR will contain an updated long-range forecast based on best available information at that time.

Comment #	Author	Topic	Comment	Response
4-6	Conservation Law Foundation	Airport Operations	While activities and operations have decreased after the reporting years, Massport should describe its planned methodology for future forecasting, especially as it has deferred mitigation projects because of reduced activity and operations. Massport must first avoid, minimize, and then mitigate damage to the environment that occur as a result of activities at Logan Airport. Massport's process for measuring impacts and devising appropriate mitigation activities must be robust to meet situational uncertainties. For Massport adequately mitigate its impacts, it must have data collection and review processes that accurately measure and understand its impact.	Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize those community impacts. Chapter 3, *Airport Planning* , discusses the status and approach of the deferred capital projects. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , and will continue to be refined as growth and activity levels increase.
4-7	Conservation Law Foundation	Airport Operations	Given this discrepancy, Massport should describe its basis and methodology for future forecasting, which will be critical to deciding the scope of future mitigation. This prior forecasting resulted in flawed and inaccurate estimates.	Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post- pandemic growth trends for activity levels. Each project that proceeds through the environmental review process evaluates the construction period and potential permanent impacts, and appropriate mitigation measures are outlined in the mitigation commitments and Section 61 Findings. These mitigation measures are reported upon in each EDR or ESPR reporting year.
4-8	Conservation Law Foundation	Airport Operations/Mitigation	The EDR does not outline a process or timeline for when these projections will be adjusted, how the adjusted projections relate to mitigation efforts (see section below), and how the methodology will differ from what was presented in the2017 ESPR. Massport has deferred several mitigation projects, and it is unclear under which activity, operations, or environmental impact scenario that these deferrals will be revisited.	Massport has prepared annual filings describing Logan Airport operating and environmental conditions since the 1970s. Throughout that period, in addition to the annual status reports (EDRs), Massport produces periodic (typically every 5-6 years) ESPR forecasts of projected passenger levels, aircraft operations, ground access trips, noise and emission impacts. As with all forecasts, they are based on best available information at the time and subject to change. A benefit of the EDR/ESPR process is that these forecasts must be regularly updated to reflect new information and combined with the environmental projections, help Massport develop strategies to continue to reduce community impacts from Logan operations. Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-peak pandemic growth trends for activity levels. Chapter 3, *Airport Planning* , discusses the status and approach of the deferred capital projects.

Comment #	Author	Topic	Comment	Response
4-9	Conservation Law Foundation	Operations/Environmental Impacts	CLF also recommends that Massport review assumptions that no longer hold true because of the pandemic, especially those that may increase environmental impacts on a unit basis. While the pandemic has reduced operations, impacts on a per-unit basis have potentially shifted.	The EDR/ESPR process, which is exclusive to Massport, is designed to address these issues on an annual basis. Annual EDRs will continue to report on current conditions while ESPRs will incorporate updated forecasts based on best available information. Several sections of the *2020/2021 EDR* describe planned mitigation that accounts for impacts prior to and following the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize those community impacts.
4-10	Conservation Law Foundation	Impacts	We recommend that Massport provide a list of all measured impacts, how said impacts are methodologically related to the activity levels presented in the ESPR forecast, and how current and forward-looking data can be used instead in both the MEPA reporting process, and in other public engagement forums	Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-peak pandemic growth trends for activity levels.
4-11	Conservation Law Foundation	Mitigation	We encourage Massport to work with community stakeholders to create a mitigation planning system which is based on actual passenger, flight, and daily traffic volumes.	Massport strives to be a good neighbor and regularly meets with community groups regarding Airport operations and impacts, projects status, upcoming projects and programs and to respond to community issues.
4-12	Conservation Law Foundation	Health Impacts	To that end, Massport should more thoroughly document public health impacts. Massport should provide a more detailed update on the Tufts and Boston University Ultrafine Particulate(UFP) study and associated findings.	Massport has an extensive noise and air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. This includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, soundproofing to eligible residents, aircraft towing requirements, and noise abatement turns. Air quality and GHG reductions programs include an extensive alternative fuel program, an HOV program that reduces the number of Airport users driving to the Airport, and conversion of ground service equipment to renewable energy sources. In 2021, Massport prepared the Net Zero Roadmap, the goal of which is to reduce Massport GHG emissions to net zero by 2031. Massport has/is also cooperating with Boston University, Tufts University, and other researchers in identifying aircraft-specific related UFPs in an urban environment with non-airport related sources. This research is underway in the East Boston area and Massport continues to contribute by providing Logan Airport operational and other pertinent data.

Comment #	Author	Topic	Comment	Response
4-13	Conservation Law Foundation	Air Quality	EEA notes that the EDR should "provide an update on the status and finding of UFP research being performed by Tufts University and Boston University regarding the identification of airport-specific related UFPs in an urban environment." The 2018/2019 EDR notes Massport's cooperation and data sharing with the study but does not provide additional detail on study findings or relevance to Massport activities.	Chapter 7, *Air Quality/Emissions Reduction* provides updated information regarding recent and ongoing scientific studies associated with airport emissions including the *Logan Airport Health Study* by Massachusetts Department of Health (2014), *Impacts of Aviation Emissions on Near-Airport Residential Air Quality* by Tufts University (2020), and similar airport-related health studies by the University of Southern California and University of Washington. The findings show key differences exist in the particle size distribution and the black carbon concentration for roadway and aircraft features. Massport is supportive of cooperative research efforts that are being funded by the FAA and co-led by Washington State University and the Massachusetts Institute of Technology (MIT), which are known as the FAA Center of Excellence for Alternative Jet Fuels and Environment, Aviation Sustainability Center (ASCENT). Massport has/is also cooperating with Boston University, Tufts University, and other researchers in identifying aircraft-specific related UFPs in an urban environment with non-airport related sources. This research is underway in the East Boston area and Massport continues to contribute by providing Logan Airport operational and other pertinent data.
4-14	Conservation Law Foundation	Air Quality	Massport should provide additional detail on any activities or research regarding the connection between heat and air quality issues.	The *2020/2021 EDR* responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. Chapter 7, *Air Quality/Emissions Reduction* includes information on air quality per the scope requirements.
4-15	Conservation Law Foundation	Mitigation	Additional mitigation is required commensurate with growth in the reporting years to minimize impacts to local communities.	Massport will continue to provide updates on its programs through the EDR/ESPR process. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , and will continue to be refined with new projects and as activity levels change.
4-16	Conservation Law Foundation	Mitigation	There should be transparent thresholds for deferred mitigation projects. We recommend that Massport develop transparent thresholds of the appropriate metric (e.g., VMT, operations, passenger activity, etc.) for when Massport will return to the implementation of these projects, or at least clarify decision-making processes for returning to these mitigation measures.	Generally, any "deferred" mitigation is tied to projects that have been deferred or activity levels that were significantly reduced beginning in March 2020 at the onset of the COVID-19 pandemic. When new projects are advanced, Massport would implement all appropriate design, construction and operational mitigation measures. Deferred ground access measures have been largely restored and/or have been aligned with current activity levels.
4-17	Conservation Law Foundation	Community Coordination/Mitigation	Massport should continue to engage with affected communities to discuss mitigation opportunities.	Massport strives to be a good neighbor and regularly meets with community groups regarding Airport operations and impacts, projects status, upcoming projects and programs and to respond to community issues.

Comment #	Author	Topic	Comment	Response
4-18	Conservation Law Foundation	Community Coordination	Massport should work with organizations and members from most affected communities prior to the release of the next iteration of the report. This will allow Massport to conduct more thoughtful planning as operations and impacts shift.	Massport strives to be a good neighbor and regularly meets with community groups regarding Airport operations and impacts, projects status, upcoming projects and programs and to respond to community issues. This has included discussions with community groups and the MEPA Office on the EDR/ESPR documents and process.
4-19	Conservation Law Foundation	Environmental Justice	State law and policies require enhanced engagement with residents of environmental justice communities. To that end, CLF encourages Massport to hold community meetings, outside of MEPA processes and after MEPA deadlines expire, to discuss ways for Massport to be a great neighbor and best implement mitigation measures associated with its environmental impacts, which are especially important during this major public health crisis.	Massport strives to be a good neighbor and regularly meets with community groups regarding Airport operations and impacts, projects status, upcoming projects and programs and to respond to community issues. Massport is closely following MEPA's amended regulations and protocols for EJ populations that are now effective for all new projects filed with MEPA. Projects at Logan Airport that are filed with MEPA will fully comply with these amended regulations and protocols.
4-20	Conservation Law Foundation	Ground Access/HOV	CLF seeks additional detail in the ESPR regarding ground transportation to conform with the Massport-CLF agreement. As this was a component of the Massport-CLF agreement, Massport should explicitly include the free Blue Line service program for employees in the 2018/2019 EDR.	Massport remains committed to the CLF agreement and will continue to report on progress towards meeting those items, subject to current conditions. As activity levels return to pre-pandemic levels, Massport will evaluate the appropriate timing for implementation on agreement commitments.
5-1	Airport Impact Relief (AIR)	Air Quality	We ask you to require that Massport make any recommendations on the topic of the efficacy of plug-in HEPA air filtration available to the public.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. This includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, and aircraft towing requirements. Air quality and GHG emissions reductions programs include an extensive alternative fuel program, an HOV program that reduces the number of Airport users driving to the Airport, and conversion of ground service equipment to renewable energy sources. In 2021, Massport prepared the Net Zero Roadmap, the goal of which is to reduce Massport GHG emissions to net zero by 2031. Chapter 7, *Air Quality/Emissions Reduction*, provides an update on its ongoing collaboration and evolving service strategy with the Massachusetts DPH and East Boston Health Center. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.

Comment #	Author	Topic	Comment	Response
5-2	Airport Impact Relief (AIR)	Forecasts/Mitigation	With flight activity up 6.3% and passenger volumes rising 10.5% during this reporting period, each more than tripling the forecasted rates, the outpacing condition has been exceeded. The EDR reports these increases and across the board increases in impacts, but does not embrace or adequately address the additional mitigation required by the Secretary.	A key element of the iterative EDR/ESPR process is that it provides Massport the opportunity to consistently review and adjust forecasts and programs in response to the latest industry trends. As has been evident over the past few decades, the aviation industry has experienced dramatic and unexpected swings in activity. Massport will continue to provide forecast and project updates through the EDR/ESPR process. Project-specific planned mitigation measures are detailed in Chapter 9, E*nvironmentally Beneficial Measures and Project Mitigation Tracking*.
5-3	Airport Impact Relief (AIR)	Public Engagement	1. Normalize collaboration through regular meetings with community, perhaps on an every 3 months schedule as part of a MEPA Special Review Process (SRP)	The EDR/ESPR process and document are specific to the Logan Airport and takes several months to prepare once year end data are provided. The process typically includes a public briefing on the materials during the comment period. In addition to the EDR/ESPR briefing, Massport meets with the Massport CAC and community groups like AIR, Inc. on a regular basis. Projects going through the environmental review process also include public meetings during the projects' scoping/Environmental Notification Form (ENF) phase.
5-4	Airport Impact Relief (AIR)	Mitigation	2. Growth-triggered mitigation strategies. Mitigation developed through this SRP should be based on actual passenger, flight, and traffic volumes to address the risk of impact backlogs seen in the present retrospective reporting system. This approach would allow Massport to implement programs over time as travel volumes and airport revenues recover	In Massport's capital planning process, consideration is given to current and future operations, and anticipated demand. Projects are brought on-line when needed as prudent budget and asset management. Information provided in the EDR informs that decision-making as do current trends, information from airlines, status of aircraft orders, and other economic factors. Chapter 2, *Activity Levels* , of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-pandemic growth trends for activity levels. Massport will continue to provide updates on its programs through the EDR/ESPR process. Project-specific planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* .
5-5	Airport Impact Relief (AIR)	Forecasts/Mitigation	Tabling mitigation planning until peak volumes return again asks MEPA and impacted communities to rely on unfounded forecasts which have proved to be gross underestimates of actual demand in the past. Growth-triggered mitigation planning would reduce this risk and satisfy MEPA's ESPR requirements.	Massport consistently works on a range of ground access, air quality and noise mitigation strategies. Recent examples include successes in advocating for FAA's funding for replacement of first generation sound insulation measures in the highest impact areas. In March 2022, Massport released its Roadmap to Net Zero which aims to reduce/offset Massport Scope 1 and 2 emissions by 2031 and work with our tenants and business partners toward reduction of Scope 3 emissions across the Authority. Similarly, Massport continues to adjust and improve its HOV measures to reduce ground access congestion and associated emissions. Chapter 2, *Activity Levels* , of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. Massport will continue to provide updates on its programs through the EDR/ESPR process. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , and will continue to be refined as growth and activity levels increase.

Comment #	Author	Topic	Comment	Response
5-6	Airport Impact Relief (AIR)	HOV	Aiming to boost Logan Express HOV by 2 million riders per year over the long term, Massport's comprehensive ground access strategy is nowhere near the scale needed to keep pace with this level of growth. The increase in SOV during just the 2018 and 2019 period has preemptively almost entirely offset the hoped for long term HOV gains. The same can be said of growth in noise, and emissions.	Prior to the COVID-19 pandemic, Massport was aggressively moving forward with new and expanded HOV services including expansion of Logan Express service hours, facility enhancements and expansion of the Logan Airport Express's Framingham Garage. In late 2019, Massport also purchased new buses to expand Logan Express urban shuttle services planned. As with many planned HOV enhancements prior to the COVID-19 outbreak, those services have been suspended, reduced or deferred based on ridership demand and reduced revenues. Chapter 3, *Airport Planning* provides a status on these deferred projects. The results of the *2019 Logan International Airport Air Passenger Ground-Access Survey* informed the HOV and ground access strategy as described in Chapter 5, *Ground Access to and from Logan Airport*. This strategy is being evaluated on an ongoing basis to adapt to the changes associated with the pandemic and the resultant passenger demands for airport access. Chapter 6, *Noise Abatement*, and Chapter 7, *Air Quality/Emissions Reduction*, discuss air and noise strategies. Results of the 2022 Air Passenger Ground-Access Survey are being reviewed based on current condition and will inform *2022 ESPR* ground access strategies.
5-7	Airport Impact Relief (AIR)	Mitigation	As we will explain in our comments on the example of Massport's request for FAA funding of additional soundproofing below, Massport's extremely low level of ambition to mitigate impacts, more than the cost or viability of these programs, is the key obstacle to progress.	Massport has in place an extensive noise emissions mitigation program that benefits all communities but especially nearby communities including East Boston, Chelsea, Revere, South Boston and Winthrop. This includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, soundproofing to eligible residents, aircraft towing requirements, and noise abatement turns. In December 2021, the MCAC put forth one of the additional procedures for further study and implementation by FAA. Massport and MIT completed the RNAV study at the end of 2021. Massport continues to work with FAA, research institutions like MIT, and the MCAC to look for ways to reduce impacts and expand research including on UFP. Massport also is working with the East Boston Health Center to target health measures for vulnerable populations. EDR/ESPRs provide cumulative snapshots of Logan Airport environmental impacts and inform the public on broad efforts to reduce impacts. Mitigation efforts are related to project-specific mitigation which are the result of separate environmental processes that include extensive public outreach and input.

Comment #	Author	Topic	Comment	Response
5-8	Airport Impact Relief (AIR)	Noise/Mitigation	The EDR offers the welcome news that Massport has submitted updated noise maps to the FAA Regional Assistant Administrator to address issues with first-generation soundproofing installations which could lead to further FAA funding for retrofits in older soundproofed homes. It is important that Massport is acknowledging the need for further soundproofing. Now, 13 months after their initial communication, Massport should escalate their efforts by writing to the regional administrator with cc to our federal delegation. They should submit a grant application to the FAA for additional funding, and if rejected, they should use landing fee money to fund this necessary program. Massport's FAA fundraising entreaties should not be mistaken for new mitigation for impacts occurring because of their airfield user's activity.	As of October 2022, Massport has submitted an application for funding under the FAA's RSIP program. The FAA has approved Massport's application and provided and initial grant amount to fund the upfront work related to sound insulation including outreach to eligible homes, application process, pre-testing, and design/bid documents for homes that pass the FAA required pre-testing. Homes that pass the pre-testing will be used as pilots to inform future phases of the program. Over time, Massport will be submitting new exposure maps and grant applications to the FAA to ensure sound insulation is available to qualified residences reflecting the most recent noise environment around Logan Airport. The FAA funds residential insulation as a dedicated set-aside within the AIP program. Massport provides matching funds.
5-9	Airport Impact Relief (AIR)	Noise/Mitigation	It would be most helpful if Massport would model or otherwise provide comprehensive analysis and discussion of the relative noise abatement value in DNL or other terms of such programs in relation to increases in noise driven by operational growth, as it is otherwise difficult for MEPA and commenters to ascribe value to the accumulation of these efforts.	Chapters 6, *Noise Abatement* describes the noise modeling approach and findings for 2020 and 2021. Massport will continue to advance strategies for portraying data and resulting impacts regarding noise contours modeling and noise abatement strategies.
5-10	Airport Impact Relief (AIR)	Noise/Mitigation	The difficulty we have had in arranging topical meetings with Port Authority staff in this and the air filtration example above underscores the importance of our suggestion above that MEPA require changes to its unique iterative reporting structure. Specifically, MEPA should require that Massport conduct a regular schedule of meetings with legitimate community advocacy groups. The structure of these meetings should not be determined by Massport staff, but by MEPA, in consultation with community partners.	Massport strives to be a good neighbor and regularly meets with community groups regarding Airport operations and impacts, projects status, upcoming projects, and programs and to respond to community issues. Massport recognizes the importance of ongoing engagement with the community and organizations. The following highlights a couple of these engagement efforts: •Massport renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others. •Massport supports, where possible, the Massport CAC. The Massport CAC is a state-legislated body that works with Massport on a range of Authority-wide topics, including environmental issues. Further information about the Massport CAC can be found at https://massportcac.org/.

Comment #	Author	Topic	Comment	Response
5-11	Airport Impact Relief (AIR)	Health	The likelihood of increased morbidities and premature mortality are burdens which families in airport impacted communities will carry throughout this recovery period and for the rest of their lives. With this in mind, the urgency and scrutiny with which we examine these iterative ESPR and EDR documents must rise sharply and steadily, and not be delayed on account of the temporary reduction in impacts caused by the pandemic.	Massport will continue to provide updates on its programs through the EDR/ESPR process. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* , and will continue to be refined as growth and activity levels increase.
5-12	Airport Impact Relief (AIR)	Noise/Health	We don't question Mr. Gjestland's credibility in his assessment of WHO, but ask that MEPA consider that all research is subject to academic sniping, but in its reporting on the health impacts of noise, Massport misses the most salient point: that European airports and governments have accepted the overall body of evidence on the health impacts of noise including the WHO Review, as well as the SoNA, Defra, and ICCAN research as legitimate drivers of policy. Had Massport met with us specifically about the available health research on noise, we could have bypassed this distraction and collaborated on a joint recommendation to MEPA as to what reasonable actions Massport could take to employ this knowledge in its mitigation planning.	The *2020/2021 EDR* responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. Massport reviews and incorporates research as appropriate into the EDR and planned - project-specific mitigation.
5-13	Airport Impact Relief (AIR)	Health	We hope that the Secretary will ask Massport to join with our Health Impact Team in reviewing the important health research and investigating possible responses. We believe a very prescriptive directive is needed as now 15 months have elapsed since the issuance of the 2017 ESPR certificate.	The 2020/2021 EDR responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. Massport has and will continue to regularly meet with community groups and stakeholders regarding Airport operations and impacts, projects status, upcoming projects and programs and to respond to community issues, specifically regarding health.
5-14	Airport Impact Relief (AIR)	Air Quality	The EDR reports that increased NO_X is a trade-off for less noise and fuel efficiency, but offers no substantive suggestions on how to reduce the NO_X burden on Logan's neighbors.	Chapter 7, *Air Quality/Emission Reductions* presents information on the regulated criteria pollutants, associated analyses, and discussions of evolving studies. Chapter 7, *Air Quality/Emission Reductions* , and Chapter 9, *Environmentally Beneficial Measures and Project Tracking Mitigation* , identify air quality impacts and planned mitigation measures.

Comment #	Author	Topic	Comment	Response
5-15	Airport Impact Relief (AIR)	Air Quality	Regarding the geo-spacial distribution of pollutants, the EDR disingenuously reports that Logan contributes only 1% of the state's total emissions (2% of the NO_X). If it were spread across the 10,555 square mile landmass of Massachusetts, Logan's pollution would be of little concern. However, as seen above in the graphic illustration of UFP pollution measured under LAX flight paths, the distribution of pollutants from mobile sources including motor vehicles and aircraft is highly concentrated near the sources, and therefore pollution impacts from Logan are highly localized and create acute health impacts. This information is essential to the discussion of Airport pollution. Further discussion of the implications of Chelsea and other research would have been helpful.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. This includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, and aircraft towing requirements. Air quality and GHG reductions programs include an extensive alternative fuel program, an HOV program that reduces the number of Airport users driving to the Airport, and conversion of ground service equipment to renewable energy sources. In 2021, Massport prepared the Net Zero Roadmap, the goal of which is to reduce Massport GHG emissions to net zero by 2031. Massport continues to work with FAA, research institutions like MIT, and the MCAC to look for ways to reduce impacts and expand research. The *2020/2021 EDR* responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. Chapter 7, *Air Quality/Emission Reduction* , includes the air quality and emissions analysis required by Massport's scope.
5-16	Airport Impact Relief (AIR)	Noise	AIR, Inc. has considered Massport's additional report that 81% of night flights occur outside of a core (12:00 AM - 5:00 AM) overnight timeframe, versus within the peripheral periods (10:00 PM - 12:00 AM, and 5:00 AM - 7:00 AM). This information is totally misleading in that the FAA approved DNL metric for aircraft noise establishes a 10dB penalty for noise occurring between 10:00PM and 7:00AM precisely to account for the increased impact of airplane noise during those hours. Massport's attempt to redefine the authorized noise metric established by FAA is completely unjustified.	Chapters 6, *Noise Abatement* describes the noise modeling approach and findings for 2020 and 2021. Massport will continue to advance strategies for portraying data and resulting impacts regarding noise contours modeling and noise abatement strategies. Massport uses the FAA-approved AEDT model for noise modeling which automatically includes a 10dB penalty for nighttime noise.
5-17	Airport Impact Relief (AIR)	Noise	AIR, Inc. has requested that Massport update PRAS in multiple EDR / ESPR comments. Hopefully we can begin a dialogue about this in the coming year. We reiterate that updating PRAS was a condition of the FAA Record of Decision of 2002. That Massport reports that the Logan CAC voted to abandon PRAS should not be taken by MEPA as an indication that PRAS is defunct. The FAA RoD is legal mitigation in Massport's Airport Improvement plan and does not offer either Massport, or the LCAC the authority to abandon PRAS. The RoD specifically states that PRAS shall remain in place until replaced or updated.	As part of the BLANS, the Logan Airport CAC chose not to pursue a new PRAS and could not come to agreement given the difficult discussion related to sharing of overflight noise. Massport will collaborate with MCAC (legislated advisory committee to Massport and superseded the Logan Airport CAC) if it chooses to undertake a new PRAS effort.

Comment #	Author	Topic	Comment	Response
5-18	Airport Impact Relief (AIR)	Environmental Impacts	Specifically we are concerned that as the recovery of air travel volumes return, per passenger environmental impacts will be accelerated.	Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-peak pandemic growth trends for activity levels. Massport will continue to provide updates on its programs through the EDR/ESPR process. Project-specific planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking* .
5-19	Airport Impact Relief (AIR)	Partnership	AIR, Inc. has done everything in our power to partner with Massport in evaluating how established and emerging science might be incorporated in Airport policy and mitigation strategies. Without such partnership, on its own Massport may end up adding UFP's to its current set of criteria pollutant reportbacks and mitigation strategies. But mere compliance with future EPA or subsequent FAA guidance which may be 5 - 10 years away will leave us essentially in the same position as we are today: with ineffective regulation allowing continued exposure of our children, elders, and families to extreme pollution. AIR, Inc. shares the public's expectation and hope that honest conversation, innovation and leadership can lead to far more expeditious and effective solutions. We hope that MEPA will agree and use this review as a means of leveraging the collaboration needed.	Massport strives to be a good neighbor and regularly meets with community groups regarding Airport operations and impacts, projects status, upcoming projects and programs and to respond to community issues. Massport continues to evaluate ways to improve community outreach and engagement, including opportunities for collaboration. Massport is committed to meeting Federal and State air quality regulatory requirements and reporting them annually in the EDR/ESPRs and to the regulatory entities.
5-20	Airport Impact Relief (AIR)	GHG Emissions/Modeling	With constantly changing methodologies, how can MEPA or the public possibly participate in a constructive conversation about relative growth and improvement in pollution? AIR, Inc. suggests that with Massport and FAA's documented failure to develop a reasonable and stable baseline against which emissions policy and mitigation can be measured, future EDR documentation should be based upon actual emissions measurements.	This *2020/2021 EDR* responds to the Secretary's Scope on the *2018/2019 EDR* dated March 19, 2021. The methodology used to develop an emissions inventory and GHG is described in Chapter 7, *Air Quality* .

Comment #	Author	Topic	Comment	Response
5-21	Airport Impact Relief (AIR)	HOV	AIR, Inc.'s Ground Access Impact Team has suggested BRT strategies in past comments on the Framingham Logan Express Garage Expansion. These, and other existing HOV programs must be taken back up by Massport if it is serious about increasing its ground access HOV mode share, especially in light of the pandemic's impact on Logan Express ridership.	Massport continues to look at opportunities to improve HOV access to the Airport, including improvements to Logan Express services. Until early 2020 when the COVID-19 pandemic began to affect daily life, Massport was aggressively pursuing a series of Logan Express improvements including expansion of the Framingham Garage. Massport had also purchased new buses to start a planned new North Station urban location. Many of those improvements had been put on hold due to the COVID-19 pandemic. Massport has proactively reinstated many of these programs in advance of a full recovery of passenger and employee levels. Of particular note is the relocation of the Peabody Logan Express site to improve access and ridership; details on that service will be presented in the next filing. Massport has also aggressively pursued federal funding to advance construction of the Framingham Logan Express garage expansion. In early October 2022, Massport reinstated the Back Bay Logan Express service. These are but three examples of Massport's continued focus on HOV strategies. Chapter 3, *Airport Planning* provides a status on deferred projects.
5-22	Airport Impact Relief (AIR)	HOV	As part of their multi-pronged approach to expanding HOV, Massport should not pause, but should now reinvigorate their plans to open the North Station urban location and accelerate their efforts to find at least one new suburban location.	Massport continues to look at opportunities to improve HOV access to the Airport, including improvements to Logan Express services. As of October 2022, the Back Bay Logan Express service was reactivated. With changing passenger demographics and travel patterns, Massport is continuing to evaluate additional urban Logan Express locations, including North Station.
6-1	Air Partners	Air Quality	Real air monitoring on exposure-relevant spatial and temporal scales is necessary to fully understand the air quality impacts of Logan Airport on the surrounding communities, and should be the foundation of air quality evaluation in future EDRs.	Olin College is collaborating with Air Inc. and the Town of Winthrop to monitor air quality in the community. Monitors were placed in Winthrop to continuously measure pollutants such as CO, CO_2, NO, NO_2, and O_3, as well as the mass concentration of $PM_{2.5/10}$, and all relevant meteorological conditions. The Olin College students are analyzing the monitoring data. Massport has provided operational data on request and will continue to collaborate when asked.
6-2	Air Partners	Air Quality	Future EDRs must employ ambient monitoring data from an expanded network of sensors modeled after that established by Air Partners in order to actually characterize community-level air quality impacts.	See Response to Comment 6-1.

Comment #	Author	Topic	Comment	Response
6-3	Air Partners	Air Quality	To summarize, while modeling studies can be helpful in understanding the total generation of pollutants by an important source like Logan Airport, routine, highly spatially- and temporally-resolved pollutant measurements are necessary to understand the real air quality impact of Logan Airport. Data can be made publicly available with minimal effort, and these data would vastly improve the real environmental data and community-level impact characterization included in future EDRs. We encourage MEPA to direct Massport investments toward expanding this network.	See Response to Comment 6-1.
6-4	Air Partners	Mitigation	On the basis of our mitigation pilot results described above, we suggest that these mitigation gaps be closed through investments in an expanded network of air monitors, routine UFP measurements, and (especially) HEPA purifiers in the local community.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. This includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, and aircraft towing requirements. Air quality and GHG emissions reductions programs include an extensive alternative fuel program, an HOV program that reduces the number of Airport users driving to the Airport, and conversion of ground service equipment to renewable energy sources. In 2021, Massport prepared the Net Zero Roadmap, the goal of which is to reduce Massport GHG emissions to net zero by 2031. Massport continues to work with FAA, research institutions like MIT, and the MCAC to look for ways to reduce impacts and expand research including on UFP. Chapter 7, *Air Quality/ Emissions Reduction* , provides an update on its ongoing collaboration and evolving service strategy with the Massachusetts DPH and East Boston Health Center. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
6-5	Air Partners	Air Quality	However, the modeling strategy employed in the EDR is severely limited in its availability to capture the true air quality impact of the airport, and emissions reduction plans do little to reduce residents' exposures in the near-term.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. This includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, and aircraft towing requirements. Chapter 7, *Air Quality/Emissions Reduction* , provides an update on air quality and Massport's ongoing collaboration and evolving service strategy with the Massachusetts DPH and East Boston Health Center. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.

Comment #	Author	Topic	Comment	Response
7-1	Sonja Tengblad	Air Quality	As the coordinator for Mothers Out Front East Boston, mother and resident of East Boston, I am calling for collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections and subsequent rise in pollutants including Nitrous Oxides and Carbon Monoxide, as shown in the latest EDR.	As part of the EDR/ESPR process, Massport is required to prepare periodic forecast updates. These updated forecasts allow for the review of local, national, and international aviation and economic trends in an effort to provide the most relevant data at the time of document filing. Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-peak pandemic growth trends for activity levels. Massport strives to be a good neighbor and regularly meets with community groups regarding Airport operations and impacts, projects status, upcoming projects and programs and to respond to community issues. Chapter 7, *Air Quality/Emission Reductions* , and Chapter 9, *Environmentally Beneficial Measures and Project Tracking Mitigation* , identify air quality impacts and planned mitigation measures.
7-2	Sonja Tengblad	Air Quality	As a community, we welcome collaboration and conversation on how Massport and East Boston's families can co-exist in healthier ways. Air filters (of particular models) placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Air quality and GHG emissions reductions programs include an extensive alternative fuel program, an HOV program that reduces the number of Airport users driving to the Airport, and conversion of ground service equipment to renewable energy sources. In 2021, Massport prepared the Net Zero Roadmap, the goal of which is to reduce Massport GHG emissions to net zero by 2031. Chapter 7, *Air Quality/Emissions Reduction*, provides an update on air quality and Massport's ongoing collaboration and evolving service strategy with the Massachusetts DPH and East Boston Health Center. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
8-1	Stephen H. Kaiser	Activity Levels	Massport should adopt a new tradition to include recent passenger data for 2021 in next year's 2020 update. If the year 2020 has shown the extraordinary COVID impacts since last March, the current year may provide a window into the results of vaccinations and other controls to gain increased safety for airline travelers and personnel. This new format would be a lead-in to 2022, when we would anticipate that the COVID threat would have been substantially controlled.	Massport has been preparing annual filings describing Logan Airport operating and environmental conditions since the 1970s. Throughout that period, in addition to the annual status reports (EDRs), Massport produces periodic (typically every 5-6 years) ESPR forecasts of projected passenger levels, aircraft operations, ground access trips, noise and emission impacts. As with all forecasts, they are based on best available information at the time and subject to change. A benefit of the EDR/ESPR process is that these forecasts must be regularly updated to reflect new information and combined with the environmental projections, help Massport develop strategies to continue to reduce community impacts from Logan operations. Due to the robust analysis and documentation of these reports, Massport presents findings each year.

Comment #	Author	Topic	Comment	Response
8-2	Stephen H. Kaiser	Ground Access/HOV	Why should the largest declines in both highway travel and commuter rail occur in the western corridor (Framingham and Worcester)?	This combined *2020/2021 EDR* follows the requirements of the Secretary's Certificate on the *2018/2019 EDR*, dated March 19, 2021. Highway travel and commuter rail usage are not within Massport's purview. Massport continues to look at ways to improve HOV access to the Airport, including working with various state agencies on regional transportation solutions to enhance HOV options. Chapter 4, *Regional Transportation*, and Chapter 5, *Ground Access to and from Logan Airport*, provide more information on regional context and ground access.
8-3	Stephen H. Kaiser	Ground Access/HOV	If there is anyone who could analyze traffic conditions for volume, speed and travel times, based on hard data, it would be Massport. They should add those skills to assess traffic flow conditions to and from Sumner and Callahan Tunnels. They did it forty years ago. Any consideration of ground access to Logan Airport would be incomplete without such an evaluation of these two tunnels.	Massport works closely with MassDOT on monitoring traffic in the tunnels and roadways that provide ground access to Logan Airport. This has been particularly necessary and relevant in 2022 during the extended weekend maintenance shut downs of the Sumner Tunnel. Both agencies continue to collaborate on measures to ease congestion along those key access roadways.
8-4	Stephen H. Kaiser	Planning	Calculate Load Factors : Most of the passenger data for 2020 has been included in the Executive Summary, and from this data trends in load factors can be easily calculated for national and Logan experience. The data suggests that Logan load factors overall are only 70 percent of their previous pre-COVID levels. The MBTA was showing a 75 percent drop in load factor when previous service levels were maintained. Ridership on various Logan Express buses could also be included, along with bus load-factors.	Load factor and traffic modeling are conducted and analyzed. Chapter 5, *Ground Access to and from Logan Airport*, provides more information on ground transportation.
8-5	Stephen H. Kaiser	Activity Levels/Modeling	Develop Future Passenger Scenarios at Logan based on various factors: a. Gradual recovery to previous activity levels	Chapter 2, *Activity Levels*, of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-peak pandemic growth trends for activity levels.
8-6	Stephen H. Kaiser	Activity Levels/Modeling	b. Slowed long-term growth due to work-at-home, virtual meetings and travel, and cutbacks on company travel expenses. Also a reduced economic expansion, including a recession -- either short-term or long term,	See Response to Comment 8-5.

Comment #	Author	Topic	Comment	Response
8-7	Stephen H. Kaiser	Activity Levels/Modeling	c. Slowed recovery due to regulatory effects, such as requirements for quarantines due to differences in state and international regulations. The experience of Britain's national isolation as a result of a new virus strain is pertinent.	See Response to Comment 8-5.
8-8	Stephen H. Kaiser	Activity Levels/Modeling	d. Resistance by certain elements in society against masks and vaccination, resulting in an extension of the COVID spread and delays in terminating the emergency. Also delays or quality control problems in vaccine distribution.	See Response to Comment 8-5.
8-9	Stephen H. Kaiser	Activity Levels/Modeling	e. Possible expansion of air-freight due to continued package delivery such as Amazon.	See Response to Comment 8-5.
8-10	Stephen H. Kaiser	Activity Levels/Modeling	f. More rapid recovery in airline passengers due to conventional tourist travel, rather than use of the decimated cruise ship industry.	See Response to Comment 8-5.
8-11	Stephen H. Kaiser	Activity Levels/Modeling	g. Summary of national and international experience with transit operations in 2020 -- both passengers served, recovery rates and recovery strategies attempted.	See Response to Comment 8-5.
8-12	Stephen H. Kaiser	Activity Levels/Modeling	h. Examples of airports that have recovered more rapidly than expected.	Chapter 2, *Activity Levels*, of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-peak pandemic growth trends for activity levels. Logan Airport is an origin-destination airport, meaning that the majority of passengers arrive and leave from Boston, and do not make connecting flights. Airports such as Chicago and Denver, where the majority of flights serve connecting passengers, are making a faster recovery than Logan Airport.

Comment #	Author	Topic	Comment	Response
8-13	Stephen H. Kaiser	Activity Levels/Modeling	i. Compilation of auto occupancy studies in 2020, to determine the impacts on shared rides and car-pooling vs. Single Occupant Vehicles.	Chapter 5, *Ground Access to and from Logan Airport,* describes the findings of the *2019 Logan International Airport Air Passenger Ground-Access Survey.*
8-14	Stephen H. Kaiser	Activity Levels/Modeling	j. Compilation of airline industry data and experimental experiences dealing with change and recovery.	See Response to Comment 8-5.
8-15	Stephen H. Kaiser	Activity Levels/Modeling	k. Explanation of major changes in plans to account for COVID impacts, and illustrate initial experience in shifting over to the new plans. Many professionals recognize the importance of planning, but not the importance of changing the plans when conditions warrant.	Chapter 3, *Airport Planning* , of the *2020/2021 EDR* describes Massport current plan for future projects, and includes consideration of the COVID-19 pandemic.
8-16	Stephen H. Kaiser	Activity Levels/Modeling	l. In an appendix, include all of the one-page Massport monthly aviation performance summaries to show passenger count changes for the years 2019 to 2021.	Chapter 2, *Activity Levels* , of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. This EDR reports on 2020 and 2021 conditions with a comparison to 2018 and 2019 conditions, and captures pandemic and post-peak pandemic growth trends for activity levels. Monthly statistics of passenger and operation levels can be found on Massport's website at https://www.massport.com/logan-airport/about-logan/airport-statistics/.
8-17	Stephen H. Kaiser	Partnerships	It might be worth a meeting bringing together officials and staff of the state's two best Authorities -- Massport and MWRA -- to discover how they both managed to talk about the problems they had to solve and how they got the job done.	Comment noted. Massport has and continues to engage with state agencies.
9-1	Emma Uppal	Forecasts/Mitigation	I am asking for some mitigation for our community [East Boston] because of the incorrect growth projections from 2018-2019 that were released in the latest EDR.	Massport adjusts its beneficial measures and project-specific mitigation strategies based on the nature of a project. The EDR/ESPR is a reporting document and unlike projects, does not trigger specific mitigation.

Comment #	Author	Topic	Comment	Response
9-2	Emma Uppal	Mitigation	Massport must consider all of the implications for East Boston residents of the increased travelers in and out of Logan; the increased air pollution, noise pollution, and traffic on our already-congested streets. We have to think, when discussing re-opening schools, if opening the windows to ventilate for COVID is worth exposing our kids to outdoor pollution.	Chapter 5, *Ground Access to and from Logan Airport,* and Chapter 6, *Noise Abatement* provides information on ground transportation and noise in 2020 and 2021. Chapter 7, *Air Quality/Emissions Reduction* , provides an update on its ongoing collaboration and evolving service strategy with the Massachusetts DPH and East Boston Health Center. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of its Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
9-3	Emma Uppal	Air Quality	East Boston residents would welcome collaboration on how Massport can co-exist with us without further poisoning our children's health. HEPA filters placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. This includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, and aircraft towing requirements. Chapter 7, *Air Quality/Emissions Reduction* , provides an update on its ongoing collaboration and evolving service strategy with the Massachusetts DPH and East Boston Health Center. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
10-1	Shelia Mooney	Energy	What COMPARABLE clean energy commitments has the airline industry put forth and what is the timeline?	A majority of the major airlines serving Logan Airport are evaluating and advancing strategies to expand use of Sustainable Aviation Fuels (SAF). In addition to looking at the longer range introduction of electric and/or hydrogen fuel aircraft, SAF is viewed as the most feasible interim strategy. As part of Massport's Roadmap to Net Zero (March 2022), the Authority is looking to partner with airlines and partners to evaluate opportunities to introduce SAF use at Logan Airport.
10-2	Shelia Mooney	Energy	It's time for the global airline industry to close the chapter on the burning of fossil fuels. This transportation model belongs to the past. Clean fuel must be our future.	Chapter 7, *Air Quality/Emissions Reduction* , describes emissions and emission reduction plans in addition to future investments. Massport is currently exploring options and issues associated with SAF production and sourcing, and as part of Massport's Net Zero GHG emissions initiative to continue to collaborate with other airports and centers of study to find feasible options to its airline partners.

Comment #	Author	Topic	Comment	Response
11-1	Nancy S Timmerman	Public Transit	First of all, in view of the tremendous reduction in air travel in 2020, it seems the reliance on high occupancy vehicles (HOVs) would be counter-productive (Page 2 of the document). Recovery of public transit will take a while. I have noted before that flights arriving just before midnight and departures between 5 and 7 am cannot be served by public transportation. The MBTA, during the best of times, only runs between 6 am and midnight. This forces people to drive, use a taxi, or, perhaps, Uber. This was true during the time period reviewed.	Massport continues to evaluate opportunities to incorporate a series of alternative transportation modes including public transit into its transportation plans; however, MBTA service times are not within Massport's control. The EDR analyzes and reports performance in HOV mode share, parking demand, and other ground access and air quality statistics under the existing EDR/ESPR process. Massport continues to look at ways to improve HOV access to the Airport, including working with various state agencies on regional transportation solutions to enhance HOV options to the Airport.
11-2	Nancy S Timmerman	Noise	In Table 6-8, on Page 6-42, it seems that there have been a number of recent technical issues with a number of the sites. It is good that efforts are still being made to keep them operational. In Table 6-13 on Page 6-51, the values of time above are computed. It is disturbing that the average above 65 dBA, which would certainly cause speech to cease, is 38.3 minutes in a 24- hour day, and the highest such value, in Winthrop, is 111 minutes, neatly 2 hours in 24. It is no wonder that Winthrop has historically objected to noise from the airport.	Massport has an extensive noise mitigation program in place that benefits all communities but especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Massport uses its Noise and Operations Monitoring System to keep close watch on the noise environments in the surrounding communities. From 2019 to 2021, Massport upgraded the NOMS, replacing 29 of the 30 monitors. Noise mitigation measures include time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, soundproofing to eligible residences, aircraft towing requirements, and noise abatement turns. In December 2021, the MCAC put forth one of the additional RNAV procedures for further study and implementation by FAA. Massport and MIT completed the RNAV study at the end of 2021. Massport continues to work with FAA, research institutions like MIT, and the MCAC to look for ways to reduce impacts. Mitigation efforts are related to project-specific mitigation which are the result of separate environmental processes that include extensive public outreach and input. Refer to Chapter 9, *Environmentally Beneficial Measures and Project Tracking Mitigation* , for more details.
11-3	Nancy S Timmerman	Climate Change	Since there has been such a concern in the recent past over the effects of climate change, it would seem that newer/older approaches might be helpful.	Chapter 1, *Introduction/Executive Summary* provides updates to Massport's sustainability and resiliency program. In addition, Massport reports on progress towards resiliency goals in its *Annual Sustainability & Resiliency Reports* . Additional information about Massport's resiliency initiatives is available at: http://www.massport.com/massport/business/capital-improvements/sustainability/climate-change-adaptation-and-resiliency/.

Comment #	Author	Topic	Comment	Response
12-1	Steve Kaiser 2	Airport Operations	Closer investigation of Figures 1-2 and 1-3 illustrates that both are based on TSA counts. However, seven-day data is plotted in Fig 1-2 and monthly data in Fig 1-3. The latter shows Logan passenger dropping to zero in early April 2020, while the seven-day change shows a 96 percent drop at the low point. I think the difference is how the curve for Logan is drawn through the monthly data points. The 96 percent figure appears to be more accurate. Tracking daily occurrences of anything can result in a very peaky curve, and the seven-day average is best for airport traffic trends and for following COVID data. Admittedly, monthly data is already collected and available, so the ideal solution is to collect the monthly summaries in a separate appendix.	Comment noted. Updated TSA counts and passenger data are included in Chapter 2, *Activity Levels* , and show the best available data.
12-2	Steve Kaiser 2	Airport Operations	Figure 1-2 represents the drop in passengers shown by an initial plunge of 94 percent. However Massport is entering a time of recovery, and the best format for the recovery may be to represent the initial condition as 6 percent, with the recovery curve ascending into a range of possible stable states between 30 and 100 percent of 2019 levels.	See Response to Comment 8-5.
12-3	Steve Kaiser 2	COVID	One would hope greater stability in the state's computerized appointment system will work to improve progress toward a trustworthy Zero-COVID future – when the masks can come off.	Massport complies with state and federal guidelines. Massport continues to evaluate available and useful technology.
12-4	Steve Kaiser 2	COVID	Because quarantines appear to be a major factor in airport recovery, I would suggest that an international survey be collected (by someone) to investigate various experiences with quarantines to date.	Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts, and Massport's strategies to minimize those community impacts.
12-5	Steve Kaiser 2	Outreach	Massport representing government and the airlines representing private business will need to work together creatively as never before.	Massport regularly collaborates with state and federal, public and private aviation stakeholders to evaluate national/international trends and opportunities to reduce the environmental and operational impact of aviation.

Comment #	Author	Topic	Comment	Response
13-1	Elanor Kebabian	Mitigation	I am a mother and resident of East Boston, and calling for collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections, as shown in the latest EDR.	Chapter 2, *Activity Levels*, of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize those community impacts. Forecasting is a complex process, made all the more difficult with shocks to the aviation system such as COVID or the events of 9-11. Massport updates its forecasts for each ESPR in 5-year intervals which allows forecasters to have an understanding of trends and other factors. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*, and will continue to be refined as growth and activity levels increase.
13-2	Elanor Kebabian	Mitigation	As a community, we welcome collaboration and conversation on how Massport and East Boston's families can co-exist in healthier ways. HEPA filters placed in all public schools within a 2 mile radius would cost just a mere $1 million dollars, a drop in the bucket considering the affects had on the residents.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
14-1	Teresa Doyle	Noise	I have been logging weekly complaints with Massport since 2018 with no results.	Chapter 6, *Noise Abatement* documents findings from Massport's noise complaint phone system and online complaint tracking system.
15-1	Alyssa Vangeli	Mitigation	I'm writing to urge collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections, as shown in the latest EDR.	Massport strives to be a good neighbor and regularly meets with community groups regarding Airport operations and impacts, projects status, upcoming projects and programs and to respond to community issues. Chapter 2, *Activity Levels*, of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize those community impacts. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*, and will continue to be refined as growth and activity levels increase.

Comment #	Author	Topic	Comment	Response
15-2	Alyssa Vangeli	Mitigation	We urge Massport to consider placing HEPA filters in all public schools within a 2 mile radius as one concrete and effective mitigation strategy. Please consider this request for the health and benefit of our children.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
16-1	Carla Ceruzzi	Mitigation	I am a parent of two and resident of East Boston since 2010, and am calling for collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections, as shown in the latest EDR.	Chapter 2, *Activity Levels*, of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize those community impacts. Forecasting is a complex process, made all the more difficult with shocks to the aviation system such as COVID or the events of 9-11. Massport updates its forecasts for each ESPR in 5-year intervals which allows forecasters to have an understanding of trends and other factors. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*, and will continue to be refined as growth and activity levels increase.
16-2	Carla Ceruzzi	Air Quality	As a community, we welcome collaboration and conversation on how Massport and East Boston's families can co-exist in healthier ways. HEPA filters placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
16-3	Carla Ceruzzi	Public Transit	Good-faith efforts to encourage public transit use over car traffic and hold airlines accountable for noise and pollution would also help!	Massport continuously works to prioritize public transit over use of single occupancy vehicles and multiple ground access travel trips. We also work closely with airlines to encourage their use of the quietest/cleanest aircraft. These efforts have led to significant reductions in noise and air quality emissions over the past few decades.

Comment #	Author	Topic	Comment	Response
17-1	Carrie Van Horn	Mitigation	I am a mother and resident of East Boston, and am calling for collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections, as shown in the latest EDR.	Chapter 2, *Activity Levels*, of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize those community impacts. Forecasting is a complex process, made all the more difficult with shocks to the aviation system such as COVID or the events of 9-11. Massport updates its forecasts for each ESPR in 5-year intervals which allows forecasters to have an understanding of trends and other factors. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*, and will continue to be refined as growth and activity levels increase.
17-2	Carrie Van Horn	Mitigation	As a community, we welcome collaboration and conversation on how Massport and East Boston's families can co-exist in healthier ways. HEPA filters placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
18-1	David Matheu	Noise	1. While the report claims that Massport cares about aircraft noise pollution, it declines to address the 100X increase in noise complaints filed with the airport since 2013 -- the introduction of RNAV/NextGen. This is a gross omission that allows Massport to downplay the problem.	Chapter 6, *Noise Abatement* documents findings from Massport's noise complaint phone system and online complaint tracking system.
18-2	David Matheu	Noise	2. While the report claims Massport tries to minimize overland/maximize over-water departures, the reality is that use of overland runway 33L is significantly increasing as a percentage of overall departures over the years of the report. This behavior has a major impact on noise. Reasons for this behavior aren't given. MEPA should not allow Massport to make such a claim when their behavior is the opposite of what they say.	Massport has an extensive noise mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. This program includes time/location limits on engine run-ups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, sound insulation for eligible residents, aircraft towing requirements, and noise abatement turns. Noise abatement procedures include late night preference for over-water operations. Additionally, there is an ongoing study by FAA which proposes a new design for overwater procedures to take advantage of RNAV. In December 2021, the MCAC put forth one of the additional procedures for further study and implementation by FAA. Massport and MIT completed the RNAV study at the end of 2021. See Chapter 6, *Noise Abatement*, Section *FAA and Massport RNAV Pilot Project*, for an update on the program.

Comment #	Author	Topic	Comment	Response
18-3	David Matheu	Noise	3. Massport claims they wish to minimize aircraft noise and be a good neighbor. But over the period of the report, they continue to pay landing fees -- bonuses, essentially -- for landing new flights at night or in the early morning (5 to 6 AM) hours. This contradicts their claim and MEPA should demand an explanation -- this is a choice Massport makes, not the FAA.	Under FAA regulations, Logan Airport is a public use airport and therefore cannot dictate to users, including airlines, when and what type of air service to provide at the Airport. Landing fees and how they are set are also based on federal regulation which prohibit discriminating against users or to limit access. For these reasons, Massport efforts have been focused on mitigation of noise (and air) impacts when possible and as detailed in the EDRs/ESPRs. Of particular note are noise abatement procedures that place aircraft over Boston Harbor during the late night periods or under conditions when certain runways are in use, such as Logan Airport's Runway 22L and Runway 22R departures.
18-4	David Matheu	Noise	4. Massport claims they employ a nominally quieter aircraft fleet. While probably technically true, this benefit is erased by the FAA's hyper-concentration of flightpaths through the disastrous, air-pollution-increasing NextGen program, because that program went with increased flight capacity and increased total noise and particulate pollution.	There is an ongoing study by FAA which proposes a new design for overwater procedures to take advantage of RNAV. In December 2021, the MCAC put forth one of the additional procedures for further study and implementation by FAA. Massport and MIT completed the RNAV study at the end of 2021. See Chapter 6, *Noise Abatement*, for additional information, on the program
19-1	Tania Castro-Daunais	Air Quality/Mitigation	I am a resident of East Boston, and am calling for collaboration between Massport and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections (off by 300%) and subsequent rise in pollutants including Nitrous Oxides and Carbon Monoxide, as shown in the latest EDR.	Chapter 2, *Activity Levels*, of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize those community impacts. Forecasting is a complex process, made all the more difficult with shocks to the aviation system such as COVID or the events of 9-11. Massport updates its forecasts for each ESPR in 5-year intervals which allows forecasters to have an understanding of trends and other factors. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*, and will continue to be refined as growth and activity levels increase.
19-2	Tania Castro-Daunais	Air Quality	As a community, we welcome collaboration and conversation on how Massport and East Boston's families can co-exist in healthier ways. HEPA filters placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.

Comment #	Author	Topic	Comment	Response
20-1	Carol Walker	Air Quality	I am a mother and resident of Winthrop, and am calling for collaboration between Massport and Winthrop and East Boston residents for mitigation on account of the 2018-2019 miscalculated growth projections and subsequent rise in pollutants including Nitrous Oxides and Carbon Monoxide, as shown in the latest EDR.	Chapter 2, *Activity Levels*, of the *2020/2021 EDR* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize those community impacts. Forecasting is a complex process, made all the more difficult with shocks to the aviation system such as COVID or the events of 9-11. Massport updates its forecasts for each ESPR in 5-year intervals which allows forecasters to have an understanding of trends and other factors. Planned mitigation measures are detailed in Chapter 9, *Environmentally Beneficial Measures and Project Mitigation Tracking*, and will continue to be refined as growth and activity levels increase.
20-2	Carol Walker	Air Quality	As a community, we welcome collaboration and conversation on how Massport and our nearby communities' families can co-exist in healthier ways. HEPA filters placed in all public schools within a 2 mile radius would cost just over $1 million dollars, a drop in the bucket compared to the $170 million Massport has spent on sound proofing.	Massport has an extensive air emissions mitigation program that benefits all communities, especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. Massport continues to evaluate opportunities to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, among others.
21-1	Frederick Salvucci	Mitigation	I suggest that there should be identified a maximum environmental footprint that humans should be exposed to at the airport and in surrounding neighborhoods, which have been exceeded for decades in terms of noise and air pollution impacts as experienced by the worker and neighboring populations, and require mitigation not only reactively based upon how much worse conditions have become, which is certainly a sensible non degradation standard, but also in comparison to any excesses over reasonable standards that have already existed for some time.	Massport has in place an extensive noise and air emissions mitigation program that benefits all communities but especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. These communities include EJ areas. Mitigation measures includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, soundproofing to eligible residents, aircraft towing requirements, and noise abatement turns. Massport continues to work with FAA, research institutions like MIT, and the MCAC to look for ways to reduce environmental impacts and expand research including on UFP. Massport is also working with the East Boston Health Center to target health measures for vulnerable populations. The EDRs/ESPRs provide cumulative snapshots of Logan Airport's environmental impacts and inform the public on efforts to reduce those impacts. Mitigation efforts are related to project-specific mitigation which are the result of separate environmental processes that include extensive public outreach and input. Refer to Chapter 9, *Environmentally Beneficial Measures and Project Tracking Mitigation*, for more details. Massport continues to identify impacts to the community surrounding Logan Airport, and has and will continue to evaluate opportunities to protect community health.

Comment #	Author	Topic	Comment	Response
21-2	Frederick Salvucci	Ground Access/HOV	I further urge that there should be a « build it back better »approach, as called for by President Biden. The temporary downturn in aviation activity caused by Covid has created an opportunity to pre- empt the worsening of conditions by adopting strategies now to lower impact. This should certainly be feasible by increasing the capacity, and decreasing the price of Logan Express services to preempt the return of severe congestion at Logan.	As part of the EDR/ESPR process, Massport is required to prepare periodic forecast updates. These updated forecasts allow for the review of local, national, and international aviation and economic trends in an effort to provide the most relevant data at the time of document filing. Chapter 2, *Activity Levels* describes methodology for future forecasting planned for the *2022 ESPR* to account for impacts of the COVID-19 pandemic. As always, the EDRs and ESPRs will provide regular updates on operational and environmental impacts and Massport's strategies to minimize those community impacts. Massport has multiple projects to address congestion issues and increasing capacity, including the RideApp management plan and Logan Express utilization. Chapter 3, *Airport Planning* , and Chapter 5, *Ground Access to and from Logan Airport* , provide more information.
21-3	Frederick Salvucci	Ground Access/HOV	This should be complemented by the long delayed completion of the Blue to Red connector, a transit improvement that was to have been in place by 2010 under DEP regulations accepted by Massport and MassDOT as part of the Big Dig, but is not yet even under construction.	Massport will continue to work with MBTA on the status and the potential design of the pedestrian connector to the Blue Line at Airport Station and ways to improve Silver Line operations to the Airport.
21-4	Frederick Salvucci	Ground Access/HOV	It should be further supplemented by an aggressive exit fee on all automobiles exiting the roadway system and entering the capacity constrained Logan circulation system, to guard against the return of gridlock both within the airport and. In the approach regional roads which were caused by the pernicious growth in UBER access, pre Covid. which caused a tragedy of the commons impact on all road users by undermining transit access and Logan Express access as preferred modes.	Comment noted.

Comment #	Author	Topic	Comment	Response
22-1	Sierra Club	Ground Transportation	We strongly recommend that the Massport eliminate CNG buses and other equipment. This fuel harms the environment and offers no meaningful environmental benefits over gasoline and may be worse for accident risks particularly at refueling stations.	Massport began the transition to cleaner fuels nearly 30 years ago and has been closely tracking advances in bus and battery technology. As these vehicles reach the end of their useful lives, and availability of clean power increases, Massport plans to transition to electric or other alternative fuels.
22-2	Sierra Club	Ground Transportation	The interim 2030 Clean Energy and Climate Plan (CECP) identifies electrification as a critical piece to reduce transportation emissions and meet our climate goals. Massport should commit to 100% and interim targets for electrification of all Logan ground equipment starting with on-airport shuttle buses, drayage trucks and forklifts. Electric GSE will also reduce ground workers exposure to combustion pollutants.	Massport's sustainability strategy and Net Zero Roadmap includes robust initiatives of electrification of vehicles and equipment with the goal of reducing greenhouse gas emissions under Massport's control by 2031 at both airports and the port. eGSE conversions for available technologies is already underway. Massport is coordinating with the MBTA on the purchase of electric buses. As part of *Net Zero Roadmap by 2031* , Massport is also looking for opportunities related to specific equipment at the airports and ports.
22-3	Sierra Club	Ground Access/HOV	Massport should expand routes served by the Logan Express to help reduce congestion and commit to electrification of all Logan Express buses by 2025. Massport should make use of the recently announced MOR-EV Truck rebate to procure electric medium-and heavy-duty vehicles and the MassEVIP subsidies for state agencies to install charging infrastructure.	Massport continues to look for ways to expand HOV ridership. Through Massport's sustainability strategy and *Net Zero Roadmap by 2031,* we are evaluating the electrification of vehicles and equipment. Massport will continue to work with state agency partners to help facilitate the transition to EV vehicles where possible.
22-4	Sierra Club	Ground Access/HOV	We urge Massport and the Department to strongly support the Blue-Red Line connector, which will increase the number of passenger and worker trips to Logan via transit. This topic should be included in the Report. Similarly the Sliver Line Underpass at D Street would improve that route.	Massport supports MassDOT and the MBTA in expanding rail and transit access across the metropolitan area and particularly to and from Logan Airport. See Chapter 4, *Regional Transportation* for collaborative efforts underway.
22-5	Sierra Club	Ground Access/HOV	It is disappointing that the 2020 procurement of 45 buses for the Silverline included polluting diesel-hybrid buses that will continue to contribute to air pollution levels in East Boston, an environmental justice community, for at least 12 years if not more. Massport should work with the MBTA to ensure that the next bus procurements for the Silverline are fully electric.	Massport will continue to work with the MBTA on procuring the best available technology available for transit and HOV opportunities. As we transition to Net Zero, Massport must balance the need to meet mission critical goals with available technology (such as maintaining and enhancing HOV as related to with Silver Line bus procurement process). In cooperation with the MBTA, it is Massport's plan that this next generation of Silver Line buses will operate on battery power at Logan Airport.
22-6	Sierra Club	Ground Access/HOV	Massport needs to make Logan Express and MBTA services more efficient and attractive in order to shift traffic from private vehicles. -Massport needs to support dedicated bus lanes on the roadways to Logan -Continue to incentivize passengers (e.g., security line prioritization) who use the Express bus service. -Logan Express fares should lowered or free if it increases volumes away from private vehicles. Airport workers should have free MBTA bus/subway passes.	Massport has a comprehensive ground access strategy which strives to enhance access to and from the airport. Massport has restored much of the Logan Express service that was temporarily reduced in March 2020. In addition, Massport has relocated the underperforming Peabody service to a location at the North Shore Mall that has much better access (using the I-93 HOV lane); we expect this location to help rebuild and expand HOV ridership from the north. While a new North Station urban location is still on hold, Massport continues to evaluate other urban and suburban locations. Massport reopened the Back Bay Logan Express service in October 2022. Massport continues to prioritize passengers on the Back Bay services in the security lines, and continues to look for opportunities to encourage passengers and employees to take HOV to the airport instead of driving in single occupancy vehicles.
22-7	Sierra Club	Ground Access/HOV	Expand electric vehicle charging infrastructure at Logan airport, Massport office and all garages.	As part of implementing Massport's Net Zero Roadmap, Massport is expanding its EV infrastructure that is already in parking garages, at the Logan Office Center, and other locations.

Comment #	Author	Topic	Comment	Response
22-8	Sierra Club	Ground Access/HOV	We would like to see passengers and workers who use plug-in EVs be given incentives such as preferential parking locations and reduced ground access fees. This includes private vehicles, taxis and TNCs. With many people working at or using Logan Airport facilities, there exists an opportunity for Massport to engage employees, passengers and the surrounding community on EVs through fun educational events, vehicle test drives, and information booths.	As part of implementing Massport's Net Zero Roadmap, Massport is developing an EV charging strategy to build on the EV charging infrastructure that is already in parking garages, at Logan Office Center and other locations. Massport is working with MassCEC to evaluate and implement strategies to enable electrification of the ride-for-hire fleet that serves Logan Airport (RideApp, taxi, limousine, etc.).
22-9	Sierra Club	Safety	Fire-fighting foams that use PFAS are not mentioned in the report but should be. These are used not just for equipment fires but also in suppression systems for the fuel storage tanks that abut the airport. These foams need to be eliminated now. We urge you to work with Federal agencies to research and allow non-PFAS options at airports.	Until the FAA approves an alternative, PFAS materials are the only materials permitted for fighting aircraft fires. Massport, has, however eliminated use of PFAS in all of its fire training exercises. The FAA is evaluating more than 400 research tests that have been completed on 15 fluorine-free firefighting foam products in an effort to switch to "firefighting foam that protects the flying public, human health and the environment," the agency said in a statement. The FAA said it expects a replacement product to be identified and eventually adopted. Massport will follow FAA safety requirements when updated.
22-10	Sierra Club	Safety	Past use of PFAS foams should be documented and mitigation plans developed as needed for sources such as runoff and groundwater.	See comment above.
22-11	Sierra Club	Air Quality	We commend the inclusion of ultrafine particles as a topic. However, the reduction or mitigation of this pollution is not discussed. While standards do not exist, Massport should be proactive about measuring and reducing this type of pollution.	Massport has many emission reduction strategies in place, which serve to reduce particulate matter and UFPs. Massport has/is cooperating with Boston University, Tufts University, and other researchers in identifying aircraft-specific related UFPs in an urban environment with non-airport related sources. This research is underway in the East Boston area and Massport continues to contribute by providing Logan Airport operational and other pertinent data. Massport is also following other nationwide studies that are expected to inform future UFP regulations.
22-12	Sierra Club	Noise	The Sierra Club supports nighttime flying restrictions. People and habitats need hours when there are no flights scheduled. We call on Massport to pilot and evaluate such a program.	As a federally-funded, public use airport, Massport does not have control over aircraft nor flight tracks which are the purview of the FAA and airline pilots. For decades, Massport has had nighttime noise rules in place that are aimed at limiting noise to the extent that is possible. Massport, working with the FAA, has also in place a nighttime runway preference use that directs aircraft over Boston Harbor and away from nearby communities. The recently completed RNAV study also has implemented new, more precise procedures that will allow for greater use of these late night preferences while minimizing impacts to the community.
22-13	Sierra Club	Light Pollution	Light pollution is not mentioned at all but should be. The entire campus should be surveyed for dark skies compliance and a plan developed to reach conformity. This might create opportunities reduce lighting and energy consumption but more importantly will help with habitat protection particularly for birds and insects.	Use of airport lighting and navigation aids are critical to the safety of airports' operations and must follow FAA regulations and design standards. Where feasible, Massport designs lighting to minimize offsite impacts. We are also working to replace airfield lighting with LEDs where feasible and practical.

Comment #	Author	Topic	Comment	Response
22-14	Sierra Club	Air Quality	Work more closely with residents and governments of neighboring communities, especially East Boston, to aggressively mitigate air pollution (e.g., filtration) and noise. Massport should work with the surrounding cities to prioritize municipal buildings serving children such as schools, libraries, community health and recreation facilities, and public housing. We need to protect children from asthma and COPD.	Massport has in place extensive noise and air emissions mitigation programs that benefit all communities but especially nearby communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. These communities include environmental justice (EJ) populations. Noise mitigation measures includes time/location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, soundproofing to eligible residents, aircraft towing requirements, and noise abatement routes. Air quality and greenhouse gas emissions (GHG) reductions programs include an extensive alternative fuel program, a high-occupancy vehicle (HOV) program that reduces the number of single occupancy vehicle trips, conversion of ground service equipment to renewable energy sources and RideApp measures to reduce trips. In 2022, Massport released its Net Zero Roadmap, the goal of which is to reduce Massport Scope 1 and 2 GHG emissions to net zero by 2031 and enable its partners and tenants to reduce their Scope 3 emissions. See Chapter 6, Noise Abatement, and Chapter 7, Air Quality/Emissions Reduction for additional information on Massport's noise and air emissions reduction efforts. Massport continues to work with the Federal Aviation Administration (FAA), and research institutions like MIT and the Massport Community Advisory Committee (MCAC) to look for ways to reduce impacts and expand research including on ultrafine particles (UFP). Massport is also working with the East Boston Health Center to target health measures for vulnerable populations. The EDRs/ESPRs provide cumulative snapshots of Logan Airport environmental impacts and inform the public on efforts to reduce those impacts. Mitigation efforts are related to project-specific mitigation which are the result of separate environmental processes that include extensive public outreach and input. Refer to Chapter 9, *Environmentally Beneficial Measures and Project Tracking Mitigation*, for more
22-15	Sierra Club	Noise	Develop a plan to measure and reduce acute noise events, which can be more disruptive especially during nighttime sleeping hours.	Massport does not have control over aircraft nor flight tracks which are the purview of the FAA and airline pilots. For decades, Massport has nighttime noise rules and over-water noise abatement routes in place that are aimed at limiting noise over populated areas to the extent that is possible. Massport, working with the FAA, also has in place a nighttime runway preference use that directs aircraft over Boston Harbor and away from nearby communities. The recently completed RNAV study also has implemented new, more precise procedures that will allow for greater use of these late night preferences while minimizing impacts to the community. The FAA required that the dB DNL noise metric incorporate a nighttime adjustment to reflect nighttime noise versus daytime noise. This metric has informed the implementation of nighttime noise restrictions like engine run-ups, over Boston Harbor flight tracks, and the metric is also used to assess eligibility for FAA funded residential sound insulation programs.

C

Proposed Scope for the 2022 ESPR

PROJECT NAME: Logan Airport 2022 Environmental Status and Planning Report (ESPR)

PROJECT LOCATION: Boston Logan International Airport, East Boston, Massachusetts

EEA NUMBER: 3247

PROPONENT: Massachusetts Port Authority (Massport)

Massport respectfully submits this proposed scope for the Logan Airport *2022 Environmental Status and Planning Report* (ESPR) for public review and comment. The *2022 ESPR* would follow the combined *2020/2021 Environmental Data Report (EDR)*, which was filed in November 2022. As directed by the Secretary of the Executive Office of Energy and Environmental Affairs (EEA), Massport will continue to use this process to evaluate the cumulative impacts associated with Logan Airport activities through preparation of an ESPR approximately every five years with data updates annually through the EDRs. This *2022 ESPR* will provide updated passenger and operations forecasts for Boston Logan International Airport (Logan Airport or the Airport), taking the pandemic effects into account. Massport will continue to post the full EDR/ESPR documents on the Massport website (http://massport.com/massport/about-massport/project-environmental-filings/). In addition to the standard report materials, the *2022 ESPR* will provide a more focused status on the impact of the COVID-19 pandemic on Logan Airport in particular and the aviation industry at large. As described in the *2020/2021 EDR*, the COVID-19 pandemic has had a significant impact on Logan Airport operations and environmental impacts; the *2022 ESPR* will provide additional details on the status of the recovery and outline expectations based on the best available information.

The proposed Scope for the *2022 ESPR* acknowledges the recent changes in the MEPA regulations over the past several years, particularly those focused on resiliency, cumulative impacts, and enhanced outreach to environmental justice (EJ) populations.

Purpose of the Logan Airport *2022 ESPR*

For nearly four decades, the Logan Airport EDRs and ESPRs (and the former Generic Environmental Impact Report [GEIR]/Annual Updates) have provided information to agencies and the public on planning activities, aircraft operations and passenger activity levels, environmental impacts, and Massport initiatives at Logan Airport.

The *2022 ESPR* will provide an update on conditions at Logan Airport for calendar year 2022. The ESPR will continue to serve as background/context against which projects at Logan Airport will be evaluated. It will also

report on the cumulative effects of Logan Airport operations and activities, compared to previous years as appropriate, and to the future forecast timeframe.

The EDR/ESPR process was developed to allow individual projects at Logan Airport to be considered and analyzed in the broader, Airport-wide context. The EDRs and ESPRs serve as the baseline analyses for project-specific environmental reviews and provide a forum for updates on Massport's mitigation programs.

The *2022 ESPR* is part of a well-established, state-level environmental review process that assesses Logan Airport's cumulative environmental impacts. The process provides a context against which individual projects at Logan Airport meeting state and federal environmental review thresholds are evaluated on a project-specific basis. By providing the Airport-wide context for air quality, noise, ground transportation, and water quality, the EDRs/ESPRs help focus the review processes for state Environmental Notification Forms (ENFs) and, if necessary, Environmental Impacts Reports (EIRs). In this manner, Massport ensures that segmented project review does not occur in the context of Massachusetts Environmental Policy Act (MEPA) review of projects at Logan Airport. The EDRs/ESPRs also provide context for federal National Environmental Policy Act (NEPA) reviews by the Federal Aviation Administration (FAA) serving as the lead federal agency.

The Airport-wide and project-specific environmental review processes are described in this report. Where appropriate, Massport will continue to identify and address any longer-term aviation and environmental trends in both EDRs and ESPRs. The reports also include information on projects that fall below MEPA review thresholds in an effort to share a fuller picture of Logan activities and plans. In short, the EDRs/ESPRs provide a planning context which complements the individual project-specific filings.

Contents of the *2022 ESPR*

Generally, the *2022 ESPR* will follow the format of the *2017 ESPR*, first presenting an overview of the role of Logan Airport in the regional planning context. The *2022 ESPR* will report on 2022 passenger and aircraft operation activity levels. This will be followed by a status report on Massport's proposed planning initiatives, projects, and mitigation. In this way, Massport will provide necessary background information to allow the reviewer to understand the environmental policies and planning which form the context of the environmental reporting, technical studies, and environmental mitigation initiatives at Logan Airport. In that the *2022 ESPR* follows the 2020/2021 EDR, it will also discuss how the COVID-19 pandemic has led to adjustments throughout the aviation industry and at Logan Airport.

The technical studies in the *2022 ESPR* will include reporting on and analysis of key indicators of Airport activity levels, the regional transportation system, ground access, noise, air quality, water quality and environmental management, and project mitigation tracking. Sustainability initiatives will be included throughout the document. Each chapter's contents are described below.

Chapter 1. Introduction/Executive Summary

This chapter of the *2022 ESPR* will include:

- Airport status within the context of the continuing COVID-19 pandemic;
- Highlights of 2022 planning and environmental conditions;
- Overview of Logan Airport and its environmental, geographic, and regulatory context;
- Overview of the EDR/ESPR cycle;
- Highlights of passenger activity levels and aircraft operations;
- Overview of the regional intermodal transportation system;
- Description of the analysis framework for the environmental reporting and technical studies to be conducted;
- Overview of the Logan Airport planning initiatives and projects;
- Overview of sustainability initiatives at Logan Airport; and
- Organization of the *2022 ESPR*.

Additionally, although EDRs and ESPRs are not projects subject to the *MEPA Public Involvement Protocol for Environmental Justice Populations*, Massport recognizes the importance of a robust outreach approach to ensure the public is aware of these reports and has an opportunity to review and comment. Therefore, Massport proposes an expanded outreach process that will be documented in this chapter to meet the spirit of this protocol. Massport will summarize its ongoing engagement with the community and organizations.

Massport will include a discussion of its outreach, which will include the following measures:

- Post a social media announcement notifying the public of upcoming filing.
- Circulate the *2022 ESPR* electronically to the EJ Reference List provided by MEPA for Massport's recent Runway 9-27 Runway Safety Area Improvement Project.
- Include a reference in this chapter, the cover letter, and the Notice of Availability that is sent to reviewers, that this chapter is available in other languages upon request.
- Translate the Notice of Availability into Spanish.
- Translate the Executive Summary into Spanish.
- Post *2022 ESPR* on Massport's website at the time of filing with MEPA, allowing for approximately an additional week of review time.
- Prepare and post on Massport's website (https://www.massport.com/massport/about-massport/project-environmental-filings/logan-airport/) fact sheets in English and Spanish that will be available during the *2022 ESPR* comment period.

Chapter 2. Activity Levels

This chapter will report on Airport activity levels for 2022 and present a future forecast for projected passenger, aircraft operations, and cargo tonnages. Items to be included for 2022 are:

- Domestic and international passenger activity levels;
- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Cargo and mail volumes;
- Comparison of 2022 aircraft operations, cargo/mail operations, and passenger activity levels to 2019 activity levels; and
- Report on national aviation trends in 2022, the effect of the pandemic, and compare to trends at Logan Airport.

This chapter will also report on Massport's most recent forecasts for Logan Airport that become the basis for the planning and impact sections that follow and for Massport's planning initiatives over the next few years. Future year analyses will be based on the updated forecast. This chapter will provide a discussion of analysis methodologies and assumptions, including anticipated fleet mix changes and other trends in the aviation industry. The section will report on the following:

- Comparison of 2022 operations to historic trends and forecasts for the future planning horizon;
- Updated forecasts of Logan Airport's passenger volume, aircraft operations, and fleet mix; and
- Comparison of forecast activity levels to historic trends, prior Logan Airport forecasts, and FAA forecasts for Logan Airport and the U.S. industry.

Chapter 3. Airport Planning

Massport continues to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport also must accommodate and guide tenant development. This chapter will describe the status of planning initiatives for the following areas:

- Ground Transportation and Parking Planning;
- Terminal Area Planning;
- Airside Planning;
- Service Area Planning;
- Airport Buffers and Open Space Planning; and
- Energy, Sustainability, and Resiliency Planning.

The chapter will provide Massport's best estimate, as of the *2022 ESPR* filing, regarding the status of projects and the anticipated short- and long-term implementation timeframe. Adjustments associated with the pandemic will be documented.

Chapter 4. Regional Transportation

The *2022 ESPR* will describe Logan Airport's role in the region's intermodal transportation system by reporting on the following:

Regional Airports

- 2022 regional airport operations, and passenger activity levels;
- Status of major plans or initiatives as provided by the regional airport entities; and
- The role that Worcester Regional Airport and Hanscom Field play in the regional aviation system and Massport's role in managing regional aviation facilities.

Regional Intermodal Transportation System

- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership.

Chapter 5. Ground Access to and from Logan Airport

The chapter will report on 2022 conditions, changes in ground access activities, and updates in traffic modeling. While references to 2020 and 2021 will be included, the primary ground access comparisons will be to pre-COVID conditions in 2019 for the following:

- High occupancy vehicle (HOV) ridership (including Blue Line, Silver Line, scheduled/unscheduled HOV, water transportation, and Logan Express);
- Logan Airport gateway volumes;
- On-Airport traffic volumes/vehicle miles traveled (VMT);
- Parking demand and management (including rates and duration statistics);
- Logan Airport Parking Freeze;
- Trends of RideApp companies, such as Uber and Lyft, and their operations at Logan Airport; Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Status of proposed ground access planning, anticipated Massachusetts Bay Transportation Authority (MBTA) ridership, and possible changes in HOV mode share;
- Status of long-range ground access management strategy planning; and

- Effect of the pandemic on landside operations and parking.

This chapter will also report on future year conditions for the future timeframe for the following ground transportation indicators:

- Traffic volumes;
- On-Airport VMT; and
- Parking demand.

The chapter will also report on HOV strategies, long-term parking management program, the status of the ongoing RideApp activities, and the status of continuing efforts to reduce single occupancy vehicle trips to the Airport and improving management of ground access and infrastructure through technology.

Chapter 6. Noise Abatement

This chapter will provide an overview of noise metrics and the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. Massport will use the FAA's Aviation Environmental Design Tool (AEDT) to model 2022 and future noise conditions.

The chapter will report on 2022 conditions for a range of traditional and supplemental metrics. While references to 2020 and 2021 will be included, the primary noise comparisons will be to pre-COVID conditions in 2019 for the following :

- Noise modeling inputs such as fleet mix, various aircraft Stage classifications, daily and nighttime operations, runway use, flight tracks, and meteorological data;
- Noise levels including annual modeled noise contours and noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed; and
- Supplemental metrics including: Cumulative Noise Index (CNI), Times-Above for 65, 75, and 85 A-weighted decibel (dBA) threshold values, and dwell and persistence analysis.

This chapter will present a discussion of analysis methodologies and assumptions, including forecast fleet mix and runway use assumptions, and report on future year conditions for the future timeframe for the following noise indicators:

- Runway utilization;
- Day-Night Average Sound Level (DNL) noise contours; and
- Population counts.

The chapter will report on noise abatement efforts including the status of the Residential Sound Insulation Program (RSIP), flight track monitoring and noise complaint tracking, web-based flight tracking system, and aircraft fleet improvements. The chapter will also report on the ongoing area navigation (RNAV) Pilot Project,

which is analyzing the feasibility of changes to some of RNAV approaches and departures from Logan Airport. A summary of studies Massport is supporting through the Aviation Sustainability Center (ASCENT), and other entities, as well as international research efforts will be reported.

Chapter 7. Air Quality/Emissions Reductions

This chapter will begin with an overview of the environmental regulatory framework affecting aircraft emissions, the National Ambient Air Quality Standards (NAAQS), the air quality designation status of the Boston Metropolitan Area, and the Massachusetts State Implementation Plan (SIP). The FAA's AEDT model and Environmental Protection Agency (EPA) required motor vehicle emissions modeling tool (MOtor Vehicle Emission Simulator [MOVES]) will continue to be used to assess aircraft-related emissions and vehicular emissions on Airport roadways. The chapter will include:

- Sources of emissions including aircraft, ground service equipment (GSE), auxiliary power units (APUs), motor vehicles, and other sources (comprising of stationary sources and fuel storage and handling facilities); [1]
- Emissions inventories for volatile organic compounds (VOCs), oxides of nitrogen (NO_x), carbon monoxide (CO), and particulate matter (PM);
- Status of ultrafine particle (UFP) studies; and
- Reporting on Massport's voluntary inventory of greenhouse gas (GHG) emissions from Logan Airport in 2022. GHG emissions will be quantified for aircraft, GSE/APUs, motor vehicles (including Massport-owned fleet vehicles), electricity, and other sources using emission factors and methodologies outlined in EEA's *Greenhouse Gas Emissions Policy and Protocol*, the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories,* and the Airports Council International (ACI) *Airport Carbon Accreditation (ACA) Program*. Consistent with EEA, the Airport Cooperative Research Program (ACRP), and ACA guidelines, the Logan Airport GHG emissions will be segregated by Scopes 1, 2, and 3 as follows:
    - **Scope 1** – GHG emissions from sources that are owned and controlled by Massport.
    - **Scope 2** – GHG emissions associated with the generation of electricity consumed but generated off-site at public utilities.
    - **Scope 3** – GHG emissions that are associated with Massport activities, but are associated with sources that are owned and controlled by others (i.e., tenants and public).

  In early 2022, Massport released its *Net Zero Roadmap by 2031*, an ambitious program to reduce Logan Airport GHG emissions. As part of that program, Massport has evolved its GHG reporting to better align with international airport GHG reporting protocols. The *2022 ESPR* and following EDRs will adopt this reporting methodology. The *2022 ESPR* will describe those refinements.

1 Stationary sources consist of the Central Heating and Cooling Plant, snow melters, emergency generators, space heaters, and fire training activities.

- Reporting on Massport's building GHG emissions (pounds of CO_2e) per square foot, and building energy use intensity (kBTU) per square foot.[2]

This chapter will present a discussion of analysis methodologies, assumptions, and results of 2022 conditions and future year conditions for the future timeframe for the below air quality indicators. Furthermore, the chapter will compare 2022 conditions to those of 2019.

- Emissions inventory for VOCs;
- Emissions inventory for NO_x;
- Emissions inventory for CO;
- Emissions inventory for PM; and
- Emissions Inventory for GHGs.

The chapter will also report on Massport's air quality emissions reduction strategies including updates on Massport's and tenant's alternative fuel vehicle (AFV) programs; minimizing emissions from motor vehicles and aircraft; and an update on Massport's efforts to encourage the use of single engine taxiing under safe conditions. The *2022 ESPR* will report on the research and regulatory status of UFPs and black carbon and on the status of Logan Airport air quality and public health studies undertaken by Massport or others, as available. Furthermore, the chapter will provide discussion of progress on the national and international efforts to decrease air emissions. It will conclude with a summary of progress on Massport's climate change adaptation and resiliency initiatives.

Chapter 8. Environmental Compliance and Management/Water Quality

This chapter will report Massport's approach to environmental management and compliance through monitoring and documentation. Reporting for 2022 will include:

- National Pollutant Discharge Elimination System (NPDES) Permit and monitoring results for Logan Airport's outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- Massachusetts Contingency Plan (MCP) activities;
- Tank management program;
- Update on the environmental management plan; and
- Fuel spill prevention.

2 CO_2e refers to carbon dioxide equivalents and kBTU refers to thousand British Thermal Unit.

The chapter will also report on Massport's water quality improvement strategies including the Logan Airport Environmental Management System (EMS), tenant technical assistance, the stormwater pollution prevention plan, and spill prevention control and countermeasure plans.

Chapter 9. Project Mitigation Tracking

This chapter will report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review and other commitments, and have commenced construction. The status of mitigation commitments made in the Section 61 Findings for the following projects will be reported:

- West Garage/Central Garage (EEA 9790);
- International Gateway (EEA 9791);
- Logan Airside Improvements Planning Project (EEA 10458);
- Terminal A Replacement Project (EEA 12096);
- Southwest Service Area Redevelopment Program/Rental Car Center (EEA 14137);
- Logan Runway Safety Area Improvements Project (EEA 14442);
- Terminal E Modernization Project (EEA 15434); and
- Runway 27 End Runway Safety Area Improvements Project (EEA 16433) (as available).

This chapter will update the status of Massport's projects with Section 61 mitigation commitments and will also identify projects for which mitigation is complete.

Appendices

MEPA Documentation

These appendices will include a copy of the Secretary's Certificate and comment letters received on the *2020/2021 EDR*. Individual responses to items raised in the Secretary's Certificate on the *2020/2021 EDR* and comments in reviewers' letters will be provided. The document will also contain copies of MEPA Certificates or documentation issued for projects at Logan Airport that refer to the EDR/ESPR documentation.

A distribution list for the *2022 ESPR* (indicating those receiving electronic documents, printed documents, or Notices of Availability with links to the online version of the ESPR) will be provided. Massport will also provide printed copies to community libraries.

Supporting Technical Documentation

Supporting technical appendices will be provided as necessary.

This Page Intentionally Left Blank.

D

Distribution

This *2020/2021 Environmental Data Report (EDR)* has been distributed to federal, state, and city agencies and to parties listed in this appendix. The list includes those entities that the Massachusetts Environmental Policy Act (MEPA) requires as part of the review of the document, representatives of governmental agencies, commenters on the *2018/2019 Environmental Data Report (EDR)*, and community groups concerned with Airport activities. **The 'E' indicates that Massport sent an electronic copy via email, the 'N' indicates that Massport sent a Notice of Availability, and the 'P' indicates that Massport sent a printed copy.** MEPA distribution requirements are currently modified due to COVID-19.

The *2020/2021 EDR* is also available on Massport's website at www.massport.com. Limited printed copies of the *2020/2021 EDR* may be requested from Brad Washburn, Massport, Logan Office Center, One Harborside Drive, Suite 200S, East Boston, MA 02128, telephone (617) 568-3546, email: bwashburn@massport.com. Printed copies of this report are available for review at the following public libraries:

	Library	Address		Library	Address
P	Boston Public Library Attn. Anna Fahey-Flynn Main Branch	700 Boylston Street Boston, MA 02116	N	Boston Public Library Brighton Branch	40 Academy Hill Road Brighton, MA 02135
N	Boston Public Library Charlestown Branch	179 Main St Charlestown, MA 02129	N	Boston Public Library Chinatown Branch	2 Boylston Street Boston, MA 02116
P	Boston Public Library Connolly Branch	433 Centre Street Jamaica Plain, MA 02130	P	Boston Public Library Dorchester Branch	690 Adams Street Dorchester, MA 02122
P	Boston Public Library East Boston Branch	365 S. Bremen Street East Boston, MA 02128	N	Boston Public Library Egleston Square Branch	2044 Columbus Ave Roxbury, MA 02119
P	Boston Public Library Fields Corner Branch	1520 Dorchester Ave Dorchester, MA 02122	N	Boston Public Library Grove Hall Branch	41 Geneva Ave Dorchester, MA 02121
N	Boston Public Library Honan-Allston Branch	300 N. Harvard Street Allston, MA 02134	N	Boston Public Library Hyde Park Branch	35 Harvard Ave Hyde Park, MA 02136
N	Boston Public Library Jamaica Plain Branch	30 South Street Jamaica Plain, MA 02130	N	Boston Public Library Codman Square Branch	690 Washington Street Dorchester, MA 02124
N	Boston Public Library Lower Mills Branch	27 Richmond Street Dorchester, MA 02124	P	Boston Public Library Mattapan Branch	1350 Blue Hill Avenue Mattapan, MA 02126
N	Boston Public Library North End Branch	25 Parmenter Street Boston, MA 02113	N	Boston Public Library Parker Hill Branch	1497 Tremont Street Roxbury, MA 02120

	Library *(Continued)*	Address		Library	Address
N	Boston Public Library Roslindale Branch	4246 Washington Street Roslindale, MA 02131	P	Boston Public Library Roxbury Branch	149 Dudley Street Roxbury, MA 02119
P	Boston Public Library South Boston Branch	646 East Broadway South Boston, MA 02127	N	Boston Public Library West End Branch	151 Cambridge Street Boston, MA 02114
P	Boston Public Library Uphams Corner Branch	500 Columbia Road Dorchester, MA 02125	P	Winthrop Public Library	2 Metcalf Square Winthrop, MA 02152
P	Bedford Public Library	7 Mudge Way Bedford, MA 01730	P	Cambridge Main Library	449 Broadway Cambridge, MA 02138
P	Cary Memorial Library	1874 Massachusetts Ave Lexington, MA 02420	P	Chelsea Public Library	569 Broadway Chelsea, MA 02150
P	Concord Public Library	129 Main Street Concord, MA 01742	P	Everett Public Library Parlin Memorial Library	410 Broadway Everett, MA 02149
P	Lincoln Public Library	3 Bedford Road Lincoln, MA 01773	N	Malden Public Library	36 Salem Street Malden, MA 02148
P	Medford Public Library	111 High Street Medford, MA 02155	P	Milton Public Library Main Branch	476 Canton Avenue Milton, MA 02186
P	Thomas Crane Public Library (Quincy Public Library)	40 Washington Street Quincy, MA 02169	P	Revere Public Library	179 Beach Street Revere, MA 02151
N	Robbins Library (Arlington Public Library)	700 Massachusetts Ave Arlington, MA 02476	P	Somerville Public Library	79 Highland Avenue Somerville, MA 02143

Federal Government

■ **United States Senators and Representatives**

N The Honorable Lori Trahan
Attn: Alexander Eliasen
U.S. House of Representatives
126 John Street, Suite 12
Lowell, MA 01852

N The Honorable Ayanna Pressley
Attn: Eric White
U.S. House of Representatives
1295 River Street
Hyde Park, MA 21236

N The Honorable Katherine Clark
Attn: Kelsey Perkins
U.S. House of Representatives
157 Pleasant Street, Suite 4
Malden, MA 02148

N The Honorable Richard E. Neal
U.S. House of Representatives
300 State Street, Suite 200
Springfield MA, 01105

N The Honorable Seth Moulton
Attn: Rick Jakious
U.S. House of Representatives
21 Front Street
Salem, MA 01970

N The Honorable William R. Keating
Attn: Mike Jackman
U.S. House of Representatives
50 Resnik Road, Suite 103
Plymouth, MA 02360

N The Honorable Jake Auchincloss
U.S. House of Representatives
29 Crafts Street, Suite 375
Newton, MA 02458

N The Honorable Stephen F. Lynch
Attn: Nicholas Zaferakis
U.S. House of Representatives
One Harbor Street, Suite 101
Boston, MA 02210

N The Honorable James P. McGovern
Attn: Kelly Brissette
U.S. House of Representatives
12 East Worcester Street, Suite 1
Worcester, MA 01604

N The Honorable Elizabeth Warren
Attn: Olivia Paulo
2400 JFK Federal Building
15 New Sudbury Street
Boston, MA 02203

N The Honorable Edward J. Markey
Attn: Katherine Morfill
975 JFK Federal Building
15 New Sudbury Street
Boston, MA 02203

■ **Environmental Protection Agency**

N Amanda Triebwasser
Lead Program
U.S. Environmental Protection
Agency – Region 1
5 Post Office Square – Suite 100
Boston, MA 02109-3912

N David Cash
Regional Administrator
U.S. Environmental Protection
Agency – Region 1
5 Post Office Square – Suite 100
Boston, MA 02109-3912

N Deborah Szaro
Deputy Regional Administrator
U.S. Environmental Protection
Agency – Region 1
5 Post Office Square – Suite 100
Boston, MA 02109-3912

■ **Federal Aviation Administration**

N Colleen D'Alessandro,
New England Regional Administrator
Department of Transportation
FAA - New England Region
1200 District Avenue
Burlington, MA 01803

N Chris Quigley
Tower Manager
Department of Transportation
Federal Aviation Administration
Logan International Airport
600 Control Tower, 19th Floor
East Boston, MA 02128

N Gail Lattrell
Director
Department of Transportation
FAA - New England Region
Airports Division
1200 District Avenue
Burlington, MA 01803

N Lisa Lesperance
Lead Community Planner
Department of Transportation
FAA - New England Region, Airports
Division
1200 District Avenue
Burlington, MA 01803

P Cheryl Quaine
Environmental Protection Specialist
Department of Transportation
FAA - New England Region,
Airports Division
1200 District Avenue
Burlington, MA 01803

Federal Government *(Continued)*

■ **United States Army Corps of Engineers**

N Colonel John A. Atilano II
Commander and District Engineer
U.S. Army Corps of Engineers
New England District
696 Virginia Road
Concord, MA 01742

■ **United States Fish and Wildlife Service**

N Kyla Hastie
Northeast Acting Regional Director
U.S. Fish and Wildlife Service
Department of the Interior
300 Westgate Center Drive
Hadley, MA 01035

N NE Field Office
U.S. Fish and Wildlife Service
Department of the Interior
70 Commercial St., Suite 300
Concord, NH 03301

State Government

■ **Senate/House of Representatives**

N Senate President Karen Spilka
Massachusetts State House
24 Beacon Street, Room 332
Boston, MA 02133

N Representative Marcos A. Devers
Vice Chair, Joint Committee on Transportation
Massachusetts State House
24 Beacon Street, Room 134
Boston, MA 02133

N Senator Sal DiDomenico
Massachusetts State House
24 Beacon Street, Room 495
Boston, MA 02133

N Senator Brendan Crighton
Chair, Joint Committee on Transportation
Massachusetts State House
24 Beacon Street, Room 109-C
Boston, MA 02133

N Speaker Ronald Mariano
Massachusetts State House
24 Beacon Street, Room 356
Boston, MA 02133

N Representative Jessica Giannino
Massachusetts State House
24 Beacon Street, Room 443
Boston, MA 02133

N Representative Daniel Ryan
Massachusetts State House
24 Beacon Street, Room 445
Boston, MA 02133

N Representative William Straus
Chair, Joint Committee on Transportation
Massachusetts State House
24 Beacon Street, Room 134
Boston, MA 02133

N Senator Nick Collins
Massachusetts State House
24 Beacon Street, Room 312-D
Boston, MA 02133

N Senator John F. Keenan
Vice Chair, Joint Committee on Transportation
Massachusetts State House
24 Beacon Street, Room 413-F
Boston, MA 02133

N Representative David Biele
Massachusetts State House
24 Beacon Street, Room 446
Boston, MA 02133

N Representative Adrian Madaro
Massachusetts State House
24 Beacon Street, Room 33
Boston, MA 02133

N Senator Lydia Edwards
Massachusetts State House
24 Beacon Street, Room 520
Boston, MA 02133

State Government *(Continued)*

■ **Executive Office of Energy and Environmental Affairs**

E Beth Card, Secretary
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 1020
Boston, MA 02114
env.internet@mass.gov

E Tori Kim, Director
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114
tori.kim@mass.gov

E MEPA Office
100 Cambridge Street, Suite 900
Boston, MA 02114
MEPA@mass.gov

E MEPA Office
Attn: EEA EJ Director
100 Cambridge Street, Suite 900
Boston, MA 02144
MEPA-EJ@mass.gov

■ **Department of Environmental Protection**

E Department of Environmental Protection
Commissioner's Office
One Winter Street
Boston, MA 02108
helena.boccadoro@mass.gov

E MassDEP Northeast Regional Office
MEPA Coordinator
205B Lowell Street
Wilmington, MA 01887
john.d.viola@mass.gov

N Daniel J. Padien, Director
Boston Waterways Regulation Program
Department of Environmental Protection
One Winter Street
Boston, MA 02108

N Glenn Keith
Director, Air and Climate Division
Department of Environmental Protection
One Winter Street, 9th Floor
Boston, MA 02108

N Sharon Weber, Deputy Director
Air and Climate Division
Department of Environmental Protection
One Winter Street, 9th Floor
Boston, MA 02108

N Lisa Rhodes, Director
Wetlands Program Division
Department of Environmental Protection
One Winter Street
Boston, MA 02108

■ **Department of Public Health**

E Department of Public Health Director of Environmental Health
250 Washington Street
Boston, MA 02115
dphtoxicology@massmail.state.ma.us

■ **Department of Conservation and Recreation**

E Department of Conservation and Recreation
MEPA Coordinator
251 Causeway Street, Suite 600
Boston, MA 02114
andy.backman@mass.gov

■ **Metropolitan Area Planning Council**

E Metropolitan Area Planning Council
60 Temple Place
Boston, MA 02111
mpillsbury@mapc.org
afelix@mapc.org

N Eric Bourassa
Transportation Director
60 Temple Place
Boston, MA 02111

State Government *(Continued)*

■ **Department of Housing and Community Development**

N Jennifer Maddox, Undersecretary
Department of Housing and Community Development
100 Cambridge Street #300
Boston, MA 02114

■ **Coastal Zone Management**

E Coastal Zone Management
Project Review Coordinator
251 Causeway Street, Suite 800
Boston, MA 02114
robert.boeri@mass.gov
patrice.bordonaro@mass.gov

■ **Central Transportation Planning Staff**

N Tegin Teich
Executive Director
Central Transportation Planning Staff
10 Park Plaza, Room 2150
Boston, MA 02116

N Gina Perille
Deputy Executive Director
Central Transportation Planning Staff
10 Park Plaza, Room 2150
Boston, MA 02116

■ **Massachusetts Water Resources Authority**

N Frederick A. Laskey
Executive Director, Massachusetts Water Resources Authority
Charlestown Navy Yard
100 First Avenue, Building 39
Charlestown, MA 02129

E Massachusetts Water Resources Authority
MEPA Coordinator
100 First Avenue
Charlestown Navy Yard
Charlestown, MA 02129
katherine.ronan@mwra.com

■ **Massachusetts Department of Transportation (MassDOT)/Massachusetts Bay Transportation Authority (MBTA)**

N Jamey L. Tesler
Secretary of Transportation
10 Park Plaza, Suite 4160
Boston, MA 02116

N Jonathan Gulliver
Administrator, Highway Division
MassDOT
10 Park Plaza
Boston, MA 02116

N Jeffrey DeCarlo
Administrator
MassDOT Aeronautics
Logan Office Center
One Harborside Drive, Suite 205N
East Boston, MA 02128

N David Mohler
Executive Director, Office of Transportation Planning
MassDOT
10 Park Plaza, Suite 4150
Boston, MA 02116

N Jessica Kenny, Director of Environmental Services, Highway Division
MassDOT
10 Park Plaza, 7th Floor
Boston, MA 02116

E MassDOT Public/Private Development Unit
10 Park Plaza, Suite #4150
Boston, MA 02116
MassDOTPPDU@dot.state.ma.us

E MassDOT District 6
MEPA Coordinator
185 Kneeland Street
Boston, MA 02111
michael.garrity@dot.state.ma.us

E MBTA
MEPA Coordinator
10 Park Plaza, 6th Floor
Boston, MA 02116-3966
MEPAcoordinator@mbta.com

N Tess Paganelli
Manager of Environmental Construction, MBTA
10 Park Plaza, Environmental Dept.
Boston, MA 02116

N Steve Poftak
MBTA General Manager
10 Park Plaza, 6th Floor
Boston, MA 02116

State Government *(Continued)*

■ Massachusetts Historical Commission	■ Massachusetts Executive Office of Health and Human Services	■ Massachusetts Department of Public Safety
P William Francis Galvin Secretary of the Commonwealth The MA Archives Building 220 Morrissey Boulevard Boston, MA 02125	N Secretary Marylou Sudders, Executive Office of Health and Human Services One Ashburton Place, 11th Floor Boston, MA 02108	N Secretary Terrence Reidy Department of Public Safety One Ashburton Place, Suite 2133 Boston, MA 02108

■ Natural Heritage and Endangered Species Program	■ Department of Energy Resources
E Natural Heritage and Endangered Species Program Division of Fisheries & Wildlife 1 Rabbit Hill Road Westborough, MA 01581 melany.cheeseman@mass.gov emily.holt@mass.gov	E Paul F. Ormond, P.E., Efficiency Division Department of Energy Resources 100 Cambridge Street, 10th Floor Boston, MA 02114 paul.ormond@mass.gov brendan.place@mass.gov

■ **Massachusetts Port Authority Board of Directors**

N Lewis G. Evangelidis, Chair Massport Board of Directors Massachusetts Port Authority One Harborside Drive East Boston, MA 02128	P Jamey Tesler Massport Board of Directors Massachusetts Port Authority One Harborside Drive East Boston, MA 02128	N Laura Sen Massport Board of Directors Massachusetts Port Authority One Harborside Drive East Boston, MA 02128
N Patricia Jacobs Massport Board of Directors Massachusetts Port Authority One Harborside Drive East Boston, MA 02128	N John Nucci Massport Board of Directors Massachusetts Port Authority One Harborside Drive East Boston, MA 02128	N Sean M. O'Brien Massport Board of Directors Massachusetts Port Authority One Harborside Drive East Boston, MA 02128
N Warren Fields Massport Board of Directors Massachusetts Port Authority One Harborside Drive East Boston, MA 02128		

Municipalities

■ **City of Boston**

■ Office of the Mayor	■ Boston Transportation Department	
N Michelle Wu, Mayor City of Boston One City Hall Square, Suite 500 Boston, MA 02201	N Brad Gerratt, Interim Commissioner Boston Transportation Department One City Hall Square, Room 721 Boston, MA 02201	N Robert D'Amico, City Planner Boston Transportation Department One City Hall Square, Room 721 Boston, MA 02201

Municipalities, City of Boston *(Continued)*

■ **Boston Planning & Development Agency**		■ **Civic Engagement and Neighborhood Services**
N James Arthur Jemison Director, Boston Planning & Development Agency One City Hall Square, 9th floor Boston, MA 02201	N Lacey Rose Director of Communications One City Hall Square, Room 805 Boston, MA 02201	N Nathalia Benitez Neighborhood Liaison, East Boston City of Boston One City Hall Square, Room 805 Boston, MA 02201
■ **Boston Parks and Recreation Department**	■ **City Clerk's Office**	■ **Boston Public Health Commission**
N Ryan Woods, Commissioner Parks and Recreation Department 1010 Massachusetts Avenue, 3rd Floor Boston, MA 02118	N Alex Geourntas City Clerk One City Hall Square, Room 601 Boston, MA 02201	E Boston Public Health Commission 1010 Massachusetts Avenue, 6th Floor Boston, MA 02118 info@bphc.org
■ **Office of Environment, Energy, and Open Space**	■ **Conservation Commission**	
N Rev. Mariama White-Hammond Chief of Environment, Energy, and Open Space One City Hall Square, Room 709 Boston, MA 02201	N Boston Conservation Commission One City Hall Square, Room 709 Boston, MA 02201	
■ **Boston Environment Department**		
N Dr. Alison Brizius, Commissioner Environment Department One City Hall Square, Room 709 Boston, MA 02201	N Kat Eshel, Deputy Director of Climate and Environmental Planning Environment Department One City Hall Square, Room 709 Boston, MA 02201	N Maura Zlody Environment Department One City Hall Square, Room 709 Boston, MA 02201
■ **Boston Water and Sewer Commission**		
N John Sullivan, Chief Engineer Boston Water and Sewer Commission 980 Harrison Avenue Boston, MA 02119	N Adam Horst, Project Director Boston Water and Sewer Commission 980 Harrison Avenue Boston, MA 02119	N Charlie Jewell, Director of Planning Boston Water and Sewer Commission 980 Harrison Avenue Boston, MA 02119
■ **Boston City Council**		
N Michael Flaherty Councilor-At-Large One City Hall Square, Suite 550 Boston, MA 02201	N Ruthzee Louijeune Councilor-At-Large One City Hall Square, Suite 550 Boston, MA 02201	N Julia Mejia Councilor-At-Large One City Hall Square, Suite 550 Boston, MA 02201
N Erin Murphy Councilor-At-Large One City Hall Square, Suite 550 Boston, MA 02201	N Gabriela Coletta Councilor, District 1 One City Hall Square, Suite 550 Boston, MA 02201	N Frank Baker Councilor, District 3 One City Hall Square, Suite 550 Boston, MA 02201

Municipalities, City of Boston *(Continued)*		
N Brian Worrell Councilor, District 4 One City Hall Square, Suite 550 Boston, MA 02201	N Ricardo Arroyo Councilor, District 5 One City Hall Square, Suite 550 Boston, MA 02201	N Kendra Lara Councilor, District 6 One City Hall Square, Suite 550 Boston, MA 02201
N Tania Fernandes Anderson Councilor, District 7 One City Hall Square, Suite 550 Boston, MA 02201	N Kenzie Bok Councilor, District 8 One City Hall Square, Suite 550 Boston, MA 02201	N Liz Breadon Councilor, District 9 One City Hall Square, Suite 550 Boston, MA 02201
N Ed Flynn Council President One City Hall Square, Suite 550 Boston, MA 02201		
■ **Town of Milton**		
N Milton Board of Selectmen Town Office Building 525 Canton Avenue Milton, MA 02186	N Nicholas Milano, Town Administrator Town Office Building 525 Canton Avenue Milton, MA 02186	
■ **City of Chelsea**		
N Thomas G. Ambrosino, City Manager, Chelsea City Hall 500 Broadway Chelsea, MA 02150	N Jeannette Cintron White, City Clerk Chelsea City Hall 500 Broadway Chelsea, MA 02150	N Roy Avellaneda, Councilor-At-Large Chelsea City Hall 500 Broadway Chelsea, MA 02150
N Stephen Sarikas Chelsea Conservation Commission Chelsea City Hall 500 Broadway Chelsea, MA 02150	N Dr. Corinna Culler, Chair Board of Health Chelsea City hall 500 Broadway Chelsea, MA 02150	N John DePriest Director of Planning & Development City of Chelsea 500 Broadway Chelsea, MA 02150
■ **City of Quincy**		
N Thomas Koch, Mayor Quincy City Hall 1305 Hancock Street Quincy, MA 02169	N Noel DiBona, Council President Quincy City Council 70 Chickatabot Road Quincy, MA 02169	N Nicole L. Crispo, City Clerk Quincy City Hall 1305 Hancock Street, 2nd Floor Quincy, MA 02169
N Charles J. Phelan, Jr., Councilor Ward 5, Quincy City Council 298 Fenno Street Quincy, MA 02170	N Brian Palmucci, Councilor Ward 4 Quincy City Council 1305 Hancock Street Quincy, MA 02169	
■ **City of Revere**		
N Brian Arrigo, Mayor Revere City Hall 281 Broadway Revere, MA 02151	N Ashley Melnik, City Clerk Revere City Hall 281 Broadway Revere, MA 02151	
■ **Town of Winthrop**		
N Tony Marino, Town Manager Winthrop Town Hall One Metcalf Square Winthrop, MA 02152	N Robert Carroll, Chairman Winthrop Planning Board Winthrop Town Hall One Metcalf Square Winthrop, MA 02152	N Karen T Winn, Chair Winthrop Conservation Commission Winthrop Town Hall One Metcalf Square Winthrop, MA 02152

Municipalities, Town of Winthrop *(Continued)*		
N James Letterie, Council President Winthrop Town Hall One Metcalf Square Winthrop, MA 02152	N Rob DeMarco Councilor-At-Large Winthrop Town Hall One Metcalf Square Winthrop, MA 02152	N Tracy Honan Councilor-At-Large Winthrop Town Hall One Metcalf Square Winthrop, MA 02152
N Richard Fucillo Councilor, Precinct 1 Winthrop Town Hall One Metcalf Square Winthrop, MA 02152	N John Munson Councilor, Precinct 2 Winthrop Town Hall One Metcalf Square Winthrop, MA 02152	N Hannah Belcher Councilor, Precinct 3 Winthrop Town Hall One Metcalf Square Winthrop, MA 02152
N Barbara Flockhart Councilor, Precinct 4 Winthrop Town Hall One Metcalf Square Winthrop, MA 02152	N Joseph Aiello Councilor, Precinct 5 Winthrop Town Hall One Metcalf Square Winthrop, MA 02152	N Stephen Ruggiero Councilor, Precinct 6 Winthrop Town Hall One Metcalf Square Winthrop, MA 02152
N Richard Bangs Airport Hazards Committee One Metcalf Square Winthrop, MA 02152	N Bill Schmidt Chair, Winthrop Board of Health 45 Pauline Street, Floor 1 Winthrop, MA 02152	P Jerome Falbo Vice Chair, Winthrop Board of Health One Metcalf Square Winthrop, MA 02152
■ **Town of Bedford**		
N Margot R. Fleischman Chair, Board of Selectmen Town of Bedford 10 Mudge Way Bedford, MA 01730	N Sarah Stanton, Town Manager Town of Bedford 10 Mudge Way Bedford, MA 01730	N Emily Mitchell Hanscom Field Advisory Commission Representative Town of Bedford 10 Mudge Way Bedford, MA 01730
■ **Town of Lexington**		
N Douglas M. Lucente, Vice Chair, Board of Selectmen & Hanscom Area Towns Committee Lexington Town Office Building 1625 Massachusetts Avenue Lexington, MA 02420	N James J. Malloy Town Manager Lexington Town Office Building 1625 Massachusetts Avenue Lexington, MA 02173	N Barbara Katzenberg Hanscom Field Advisory Commission Representative Lexington Town Office Building 1625 Massachusetts Avenue Lexington, MA 02173
■ **Town of Concord**		
N Michael Johnson Chair, Board of Selectman PO Box 535 Concord, MA 01742	N Kerry Lafleur Town Manager PO Box 535 Concord, MA 01742	N Mark Giddings Hanscom Field Advisory Commission Representative PO Box 535 Concord, MA 01742
■ **Town of Lincoln**		
N Timothy S. Higgins Town Administrator Lincoln Town Office 16 Lincoln Road, First Floor Lincoln, MA 01773	N Jennifer Glass Chair, Board of Selectmen Lincoln Town Office 16 Lincoln Road Lincoln, MA 01773	N Christopher Eliot Hanscom Field Advisory Commission Representative Lincoln Town Office 16 Lincoln Road Lincoln, MA 01773

Municipalities *(Continued)*

■ **City of Everett**

N Mayor Carlo DeMaria
Everett City Hall
484 Broadway
Everett, MA 02149

N Frederick E. Cafasso
Planning Board
Everett City Hall
484 Broadway, Room 25
Everett, MA 02149

N Matt Lattanzi, Esq.
Director, Planning & Development
Everett City Hall
484 Broadway, Room 25
Everett, MA 02149

■ **City of Medford**

N Mayor Breanna Lungo-Koehn
Medford City Hall
85 George Hassett Drive, Rm 202
Medford, MA 02155

N Community Development Board
Medford City Hall
85 George Hassett Drive
Medford, MA 02155

N Alicia Hunt
Director, Office of Planning, Development, and Sustainability
Medford City Hall
85 George Hassett Drive, Rm 308
Medford, MA 02155

Community Groups and Interested Parties

■ **Massport Community Advisory Committee (CAC)**

N Roseann Bongiovanni
Chair, Massport CAC
c/o Law Office of Robert Allen, Jr., LLP 300 Washington Street
Brookline, MA 02445

N Aaron Toffler
Executive Director, Massport CAC
c/o Law Office of Robert Allen, Jr., LLP 300 Washington Street
Brookline, MA 02445

■ **Charlestown Neighborhood Council**

N Tom Cunha
Chairman, Charlestown Neighborhood Council
PO Box 397
Charlestown, MA 02129

N Peggy Bradley
First Vice Chairman, Charlestown Neighborhood Council
PO Box 397
Charlestown, MA 02129

■ **Chelsea Community**

N Rick Gopen
President, Chelsea Rotary
PO Box 505647
Chelsea, MA 02150

N Rosalba Medina, President
Chelsea Collaborative
318 Broadway
Chelsea, MA 02150

N Paul Nowicki
President, Chelsea Chamber of Commerce
308 Broadway
Chelsea, MA 02150

N Leo Robinson
Councilor At-Large, Chelsea City Council
Chelsea City Hall, Room #306
500 Broadway
Chelsea, MA 02150

■ **Jamaica Plain Community**

N Nancy Brooks and Maura Meagher
92 Bourne St
Jamaica Plain, MA 02130

N Marvin Kabakott
98 Bourne St
Jamaica Plain, MA 02130

N Martha Merson
19 Roseway St
Jamaica Plain, MA 02130

N Susan Morong
33 Bournedale Rd
Jamaica Plain, MA 02130

Community Groups and Interested Parties (Continued)

■ **East Boston Community**

E Michelle Moon Greenway Coordinator, Friends of the Mary Ellen Welch Greenway eastiegreenway@gmail.com	N David Arinella 20 Thurston Street East Boston, MA 02128	N Miguel Vargas, Executive Director East Boston Main Streets 154 Maverick Street East Boston, MA 02128
N Commodore Jeffries Yacht Club 565 Sumner Street East Boston, MA 02128	P Patricia D'Amore 95 Webster Street East Boston, MA 02128	N Justin Pasquariello Executive Director, East Boston Social Centers 68 Central Square East Boston, MA 02128
N Fran Carbone 174 Bayswater Street East Boston, MA 02128	N Mary Berninger 156 St. Andrew Road East Boston, MA 02128	E Neel Batra Gove Street Neighborhood Association neelesh.batra@gmail.com
N Charles Marcella Harbor View Neighborhood Association 178 Wordsworth Street East Boston, MA 02128	N Louise Montanino President, Piers PAC 135 Cottage Street East Boston, MA 02128	E Eagle Hill Civic Association 106 White Street East Boston, MA 02128 contact@eaglehillcivic.org
N Enilda Lovo Lead Coordinator, Neighbors United for a Better East Boston (NUBE) 19 Meridian Street, Suite #4 East Boston, MA 02128	E Noah Lewkowitz, Vice President Orient Heights Neighborhood Association orientheightsnc@gmail.com	N Joanne Pomodoro 683 Bennington Street East Boston, MA 02128
E Jeffries Point Neighborhood Association board@jeffriespoint.org	N Gail Miller, President Airport Impact Relief Inc. 232 Orient Avenue East Boston, MA 02128	N Christopher Marchi, Vice President Airport Impact Relief Inc. 232 Orient Avenue East Boston, MA 02128
N Michael Triant, Executive Director Salesian Boys & Girls Club 150 Byron Street East Boston, MA 02128	N Joseph Gaeta, Executive Director East Boston YMCA 215 Bremen Street East Boston, MA 02128	N East Boston Chamber of Commerce 464 Bremen Street East Boston, MA 02128
N Commodore Orient Heights Yacht Club 61 Bayswater Street East Boston, MA 02128	N Fran Riley 193 Trenton Street East Boston, MA 02128	N Anna DiMaria, Esq. 23 Meridian Street East Boston, MA 02128

■ **South Boston Community**

N Luanne O'Connor, President City Point Neighborhood Association P.O. Box E-37 South Boston, MA 02127	N Anna White Mayor's Office of Neighborhood Services 1 City Hall Square, Room 805 Boston, MA 02201	N Lucky Devlin 718 East Second Street South Boston, MA 02127
N Mr. William Spain President, Castle Island Association PO Box 342 South Boston, MA 02127	E Seaport Alliance for a Neighborhood Design mail5001@seaportalliance.org	N Fort Point Neighborhood Association Box 52122 Boston, MA 02205

Community Groups and Interested Parties, South Boston Community (Continued)

N Ellie Kasper
St. Vincent's Neighborhood Association
125 West Third Street
South Boston, MA 02127

■ **Winthrop Community**

N Vincent Recchia
President, Winthrop Chamber of Commerce
207 Hagman Road
Winthrop, MA 02152

N Betsy Shane
Executive Director, Winthrop Chamber of Commerce
207 Hagman Road
Winthrop, MA 02152

N Mary Mitchell
President, Friends of Belle Isle Marsh
P.O. Box 575
East Boston, MA 02128

N Robert Pulsifer
30 Sagamore Avenue
Winthrop, MA 02152

N Brian Perrin
Vice President, Winthrop Chamber of Commerce
207 Hagman Road
Winthrop, MA 02152

N John Vitagliano
19 Seymour Street
Winthrop, MA 02152

■ **Organizations and Other Interested Parties**

N Jesse Spence
President, Noise Control Engineering
85 Rangeway Road, Blng 2, Floor 2
Billerica, MA 01862

N Dorothy McGlincy
Executive Director, Massachusetts Association of Conservation Commissions
10 Juniper Road
Belmont, MA 02478

N Erik Levy
Save That Stuff Inc.
200 Terminal Street
Charlestown, MA, 02129

N Dr. Bruce A. Egan
President, Egan Environmental, Inc.
75 Lothrop Street
Beverly, MA 01915

N K. Dun Gifford
President, Comm. for Regional Transportation
15 Hilliard Street
Cambridge, MA 02138

N Bradley Campbell
President, Conservation Law Foundation
62 Summer Street
Boston, MA 02116

N Stephen Schultz
Engel & Schultz, LLP
One Federal Street, Suite 2120
Boston, MA 02110

N Kathy Abbott
President and CEO, Boston Harbor Now
1 Constitution Road
Boston, MA 02109

N Wig Zamore
13 Highland Avenue, #3
Somerville, MA 02143

N Celia Doremus, Chair
Sierra Club – MA Chapter
P.O Box 742
Westborough, MA 01581

N Daniel McCormack R. S., C.H.O.
Director of Public Health
Weymouth Town Hall
75 Middle Street
Weymouth, MA 02189

N Patrick Herron, Executive Director
Mystic River Watershed Association
20 Academy Street, Suite 306
Arlington, MA 02476

N Francis X. Callahan, Jr., President
Massachusetts Building Trades Unions
35 Highland Avenue
Malden, MA 02148

N David J. O'Neill, President
Massachusetts Audubon Society
208 South Great Road
Lincoln, MA 01773

N James Linthwaite
155 Cowper Street
East Boston, MA 02128

N Darrin McAuliffe
Manager-Secretary, Rider Oversight Committee
45 High Street
Boston, MA 02110

E Somerville Transportation Equity Partnership
info@somervillestep.org

N Michael Leon, Esq.
Chair, Save the Harbor/Save the Bay
212 Northern Avenue, Suite 304 W
Boston, MA 02210

Organizations and Other Interested Parties (Continued)

N John Antonellis
93 Lexington Street
East Boston, MA 02128

N Darryl Pomicter
136 Myrtle Street
Boston, MA 02114

N Stephen H. Kaiser, PhD.
191 Hamilton Street
Cambridge, MA 02139

N James Roberts
59 Magazine Street
Cambridge, MA 02139

■ **Massport Business Group**

N Chris Anderson
Massachusetts High Technology Council
2400 District Ave #110,
Burlington, MA 01803

N James Brett, President & CEO
New England Council
98 North Washington Street, No. 303
Boston, MA 02114

N J.D. Chesloff, Executive Director
Massachusetts Business Roundtable
40 Court Street, Suite 11
Boston, MA 02108

N Bob Coughlin
Massachusetts Biotech Council
700 Technology Square, 5th Floor
Cambridge, MA 02139

N Rick Dimino
A Better City
14 Beacon Street, Suite 402
Boston, MA 02108

N Rob McCarron, President
Association of Independent Colleges and Universities
5 Brighton Street
Belmont, MA 02478

N Beth O'Neill Maloney
Kendall Square Association
510 Kendall Street
Cambridge, MA 02142

N Peter Forman, President & CEO
South Shore Chamber of Commerce
1050 Hingham Street
Rockland, MA 02370

N Abbie Goodman
ACEC MA
The Engineering Center Education Trust
One Walnut Street
Boston, MA 02108

N Carolyn Kirk
Mass Technology Collaborative
2 Center Plaza, Suite 200
Boston, MA 02108

N Bill Guenther
Mass Insight
69 Canal Street, 3rd Floor
Boston, MA 02114

N Peter Abair
MassEcon
101 Walnut Street
Watertown, MA 02108

N Eileen McAnneny
Massachusetts Taxpayers Foundation
333 Washington Street, Suite 853
Boston, MA 02108

N Jesse Mermell
Alliance of Business Leadership
PO Box 961149
Boston, MA 02196

N Josh Ostroff
Transportation for Massachusetts
50 Milk Street, 16th Floor
Boston, MA 02109

N James Rooney
Boston Chamber of Commerce
265 Franklin Street, Suite 1701
Boston, MA 02110

N Kristen Rupert
Associated Industries of Massachusetts
1 Beacon Street, 16th Floor
Boston, MA 02108

* Betsy Shane
Winthrop Chamber of Commerce
207 Hagman Road
Winthrop, MA 02152

N Brian Johnson
MassMedic
PO Box 177
Brookline, MA 02446

N Monica Tibbits-Nutt
128 Business Council
395 Totten Pond Road, Suite 302
Waltham, MA 02451

N Greg Torres
MassINC
11 Beacon Street, Suite 500
Boston, MA 02108

N Greater Boston Visitors and Convention Bureau
139 Tremont Street
Boston, MA 02111

Commenters on the *2018/2019 EDR*		
N Representative Adrian Madaro State House, Room 134 Boston, MA 02133-1054	* Department of Energy Resources 100 Cambridge Street, Suite 1020 Boston, MA 02114	* Town of Milton Office of Select Board 525 Canton Avenue Milton, MA 02186
N Staci Rubin Conservation Law Foundation 62 Summer Street Boston, MA 02110	N Air, Inc. 395 Maverick Street East Boston, MA 02128	N Air Partners Franklin W. Olin College of Engineering 1000 Olin Way Needham, MA 02492
N Sonja Tengblad 63B Maverick Square, Apt 2 East Boston, MA 02128	N Stephen H. Kaiser 191 Hamilton Street Cambridge, MA 02139	E Emma Uppal Uppal.emma@gmail.com
E Sheila Mooney shebamoon@hotmail.com	N Nancy S. Timmerman, P.E. 25 Upton Street Boston, MA 02118-1609	E Eleanor Kebabian eleanor.kebabian@gmail.com
N Teresa Doyle 11 Robeson Street Jamaica Plain, MA 02130	N Alyssa Vangeli 198 Everett Street East Boston, MA 02128	E Carla Ceruzzi ceruzzi@gmail.com
N Carrie Van Horn 3 Hooten Court East Boston, MA 02128	N David Matheu 59 Everett Street Arlington, MA 02474	E Tania Castro-Daunais tania.gomes.castro@gmail.com
E Carol Walker carwalker58@gmail.com	E Frederick Salvucci salvucci@mit.edu	

*Indicates that the contact is referenced in previous section.

This Page Intentionally Left Blank.