

*In the opinion of Foley & Lardner LLP, Bond Counsel, based upon an analysis of existing laws, regulations, rulings, and court decisions and assuming, among other matters, the accuracy of certain representations and compliance with certain covenants, interest on the 2017 Bonds is excluded from gross income for federal income tax purposes under Section 103 of the Internal Revenue Code of 1986, as amended (the "Code"), except for interest on any 2017 Bond for any period during which such 2017 Bond is held by a person who is a "substantial user" of facilities financed with the proceeds of the 2017 Bonds or a "related person" of such a substantial user (within the meaning of Section 147(a) of the Code). In addition, interest on the 2017 Bonds is a specific preference item for purposes of the federal individual and corporate alternative minimum taxes. In the opinion of Bond Counsel, the 2017 Bonds, their transfer and the income therefrom (including any profit made from their sale) will be exempt from taxation within The Commonwealth of Massachusetts. Bond Counsel expresses no opinion as to whether the 2017 Bonds or the interest thereon will be included in the measure of Massachusetts estate and inheritance taxes and certain Massachusetts corporation excise and franchise taxes. Bond Counsel expresses no opinion regarding any other federal or Massachusetts tax consequences, or regarding tax consequences of states other than The Commonwealth of Massachusetts. See "TAX MATTERS" herein.*



**\$169,500,000**  
**MASSACHUSETTS PORT AUTHORITY**  
**Revenue Bonds, Series 2017-A (AMT)**

**Dated: Date of Delivery**

**Due: July 1, as shown on page (i) hereof**

The Massachusetts Port Authority Revenue Bonds, Series 2017-A (referred to herein as the "2017 Bonds") are being issued to finance certain capital improvements and related costs of the Massachusetts Port Authority (the "Authority") and to refund certain previously issued Bonds, as described herein. The 2017 Bonds will be secured on a parity basis with the Authority's outstanding senior revenue bonds, as more fully described herein. **The 2017 Bonds will be payable solely from Revenues of the Authority which are pledged under the 1978 Trust Agreement and from certain funds and accounts held by the Trustee, all as described herein. The Authority has no taxing power. The 2017 Bonds will not constitute a debt, or a pledge of the faith and credit of The Commonwealth of Massachusetts or of any political subdivision thereof.**

The 2017 Bonds will be issued as fully registered bonds and, when issued, will be registered in the name of Cede & Co., as registered owner and nominee for The Depository Trust Company, New York, New York ("DTC"). Purchasers will acquire beneficial ownership interests in the 2017 Bonds in denominations of \$5,000 or integral multiples thereof and will not receive physical delivery of bond certificates. So long as Cede & Co. is the registered owner of the 2017 Bonds, principal, premium, if any, and interest will be payable by U.S. Bank National Association, Boston, Massachusetts, as Trustee (the "Trustee"), to Cede & Co., as nominee for DTC. See "THE 2017 BONDS – Book-Entry Only Method."

The 2017 Bonds will bear interest from their date of original delivery, payable each January 1 and July 1, commencing January 1, 2018.

The 2017 Bonds are subject to optional and mandatory redemption prior to maturity as described herein.

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**See page (i) hereof for maturities, principal amounts, interest rates and yields.**


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*The 2017 Bonds are offered when, as and if issued by the Authority and received by the Underwriters, subject to the receipt of an unqualified approving opinion as to legality of Foley & Lardner LLP, Boston, Massachusetts, Bond Counsel, and certain other conditions. Certain legal matters will be passed upon for the Authority by its Disclosure Counsel, Locke Lord LLP, Boston, Massachusetts, and for the Underwriters by their counsel, Hinckley, Allen & Snyder LLP, Boston, Massachusetts. PFM Financial Advisors LLC, San Francisco, California, serves as Financial Advisor to the Authority. Delivery of the 2017 Bonds to DTC or its custodial agent is expected in New York, New York on or about July 19, 2017.*

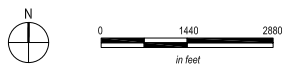
**Barclays**  
**Loop Capital Markets** **Piper Jaffray & Co.**



**massport** Massachusetts Port Authority  
 Capital Programs Department  
 July 2017

 Approximate Massport Property

# Massport Facilities



Notes:  
 This drawing is intended for informational purposes only and no use may be made of the same without the express written permission of the Massachusetts Port Authority ("Massport"). Massport does not certify the accuracy, information or title to the properties contained in this plan nor make any warranties of any kind, express or implied, in fact or by law, with respect to any boundaries, easements, restrictions, claims, overlaps or other encumbrances affecting such properties.  
 Image Source: April, 2008 - Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Energy and Environmental Affairs

# Massachusetts Port Authority

**\$169,500,000**

## Revenue Bonds, Series 2017-A (AMT)

Maturity (July 1)	Amount	Interest Rate	Yield	CUSIP <sup>†</sup>	Maturity (July 1)	Amount	Interest Rate	Yield	CUSIP <sup>†</sup>
2018	\$5,565,000	5.00%	1.20%	575896RT4	2028	\$8,960,000	5.00%	2.62%*	575896SD8
2019	6,095,000	5.00	1.24	575896RU1	2029	3,770,000	5.00	2.75*	575896SE6
2020	6,880,000	5.00	1.39	575896RV9	2030	2,560,000	5.00	2.84*	575896SF3
2021	9,205,000	5.00	1.51	575896RW7	2031	2,685,000	5.00	2.91*	575896SG1
2022	9,970,000	5.00	1.70	575896RX5	2032	2,820,000	5.00	2.96*	575896SH9
2023	8,225,000	5.00	1.88	575896RY3	2033	2,960,000	5.00	3.01*	575896SJ5
2024	8,795,000	5.00	2.02	575896RZ0	2034	3,110,000	5.00	3.06*	575896SK2
2025	9,380,000	5.00	2.20	575896SA4	2035	3,265,000	5.00	3.10*	575896SL0
2026	10,010,000	5.00	2.35	575896SB2	2036	3,430,000	5.00	3.13*	575896SM8
2027	10,670,000	5.00	2.49	575896SC0	2037	3,600,000	5.00	3.15*	575896SN6

\$20,885,000 5.00% Term Bonds due July 1, 2042; Yield 3.25%\*; CUSIP<sup>†</sup>: 575896SP1

\$26,660,000 5.00% Term Bonds due July 1, 2047; Yield 3.30%\*; CUSIP<sup>†</sup>: 575896SQ9

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<sup>†</sup> Copyright, American Bankers Association. CUSIP data herein are provided by CUSIP Global Services, managed by S&P Capital IQ on behalf of The American Bankers Association. The CUSIP numbers listed above are being provided solely for the convenience of Bondholders only at the time of issuance of the 2017 Bonds and the Authority does not make any representation with respect to such numbers or undertake any responsibility for their accuracy now or at any time in the future.

\* Priced at the stated yield to the July 1, 2027 optional redemption date at a redemption price of 100%.

No dealer, broker, salesperson or other person has been authorized by the Authority or any of its agents or the Underwriters to give any information or to make any representations other than those contained in this Official Statement, and, if given or made, such other information or representations must not be relied upon as having been authorized by any of the foregoing. This Official Statement does not constitute an offer to sell or the solicitation of an offer to buy nor shall there be any sale of the 2017 Bonds by any person in any jurisdiction in which it is unlawful for such person to make such offer, solicitation or sale. The information set forth herein has been furnished by the Authority and The Depository Trust Company and includes information from other sources that are believed to be reliable but, as to information from sources other than the Authority, is not to be construed as a representation of the Authority. The information and expressions of opinion contained herein are subject to change without notice and neither the delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in the affairs of the Authority since the date hereof.

The Underwriters have provided the following sentence for inclusion in this Official Statement. The Underwriters have reviewed the information in this Official Statement in accordance with, and as part of, their responsibilities to investors under the federal securities laws as applied to the facts and circumstances of this transaction, but the Underwriters do not guarantee the accuracy or completeness of such information.

This Official Statement contains forecasts, projections and estimates that are based on current expectations. In light of the important factors that may materially affect the financial condition of the Authority and the aviation industry generally and other economic and financial matters, the inclusion in this Official Statement of such forecasts, projections and estimates should not be regarded as a representation by the Authority or the Underwriters that such forecasts, projections and estimates will occur. Such forecasts, projections and estimates are not intended as representations of fact or guarantees of results.

**IN CONNECTION WITH THIS OFFERING, THE UNDERWRITERS MAY OVER-ALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE 2017 BONDS AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.**

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# MASSACHUSETTS PORT AUTHORITY

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**OFFICIAL STATEMENT**  
**of the**  
**MASSACHUSETTS PORT AUTHORITY**  
**Relating to its**  
**\$169,500,000 Revenue Bonds, Series 2017-A (AMT)**

**INTRODUCTION**

**General**

This Official Statement of the Massachusetts Port Authority (the “*Authority*”) sets forth certain information concerning the Authority and its \$169,500,000 Revenue Bonds, Series 2017-A (the “*2017 Bonds*”).

**The Authority**

The Authority, created pursuant to Chapter 465 of the Massachusetts Acts of 1956, as amended to date (the “*Enabling Act*”), is a body politic and corporate and a public instrumentality of The Commonwealth of Massachusetts (the “*Commonwealth*” or “*Massachusetts*”). The Authority owns, operates and manages the “*Airport Properties*,” consisting of Boston-Logan International Airport (the “*Airport*” or “*Logan Airport*”), Laurence G. Hanscom Field (“*Hanscom Field*”) and Worcester Regional Airport (“*Worcester Regional Airport*”); and the “*Port Properties*,” consisting of certain facilities in the Port of Boston (the “*Port*”) and other properties. APPENDIX A – Information Statement of the Authority sets forth additional information concerning the Authority, the Airport Properties, the Port Properties, other activities of the Authority, its capital program, revenues and selected financial data of the Authority.

**The 2017 Bonds**

The 2017 Bonds are to be issued under and pursuant to the Enabling Act, a Trust Agreement by and between the Authority and U.S. Bank National Association, as trustee (the “*Trustee*”), dated as of August 1, 1978, as amended and supplemented (the “*1978 Trust Agreement*”), and a resolution of the Authority pertaining to the issuance of the 2017 Bonds (the “*Bond Resolution*”) adopted by the Authority on June 15, 2017. The 2017 Bonds are being issued (i) to finance certain capital improvements and related costs, including capitalized interest thereon, (ii) to refund certain previously issued Bonds (collectively, the “*Refunded Bonds*”), (iii) to finance a portion of the Reserve Account requirement applicable to the 2017 Bonds, if any, and (iv) to finance costs of issuing the 2017 Bonds. See “PLAN OF FINANCE,” “SECURITY FOR THE 2017 BONDS – Reserve Account” and APPENDIX A – Information Statement of the Authority – Capital Program – Funding Sources.

The 2017 Bonds and the outstanding Bonds that have been previously issued by the Authority under the 1978 Trust Agreement on a parity therewith, and any additional parity Bonds that may be issued hereafter under the 1978 Trust Agreement are collectively referred to herein as the “*Bonds*.” For a description of the outstanding Bonds of the Authority and the pledge of Revenues of the Authority under the 1978 Trust Agreement, see “SECURITY FOR THE 2017 BONDS.”

**Additional Information**

This Official Statement includes a description of the Authority, its facilities and certain financial and operational factors relating to the Authority, and a description of the 2017 Bonds and the security therefor. Except where noted, all information presented in this Official Statement has been provided by the Authority. The following appendices are included as part of this Official Statement: APPENDIX A – Information Statement of the Authority; APPENDIX B – Financial Statements of the Authority for the fiscal years ended June 30, 2016 and 2015; APPENDIX C – Boston Logan International Airport Market Analysis (the “*Airport Market Analysis*”) of ICF

International, Cambridge, Massachusetts (“ICF”) dated June 15, 2017; APPENDIX D – Review of Airport Properties Net Revenues Forecasts (the “*Review of Revenue Forecasts*”) of LeighFisher Inc., Burlingame, California (“*LeighFisher*”) dated June 15, 2017; APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement; APPENDIX F – Authority Request for Written Consent to Proposed Amendments; APPENDIX G – Form of Continuing Disclosure Certificate; and APPENDIX H – Form of Opinion of Bond Counsel. APPENDIX A has been provided by the Authority. APPENDICES E, F and H have been prepared by Foley & Lardner LLP, Bond Counsel to the Authority. APPENDIX G has been prepared by Locke Lord LLP, Disclosure Counsel to the Authority.

Certain defined terms that are capitalized but not defined herein are defined in the 1978 Trust Agreement. See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Certain Definitions. All references in this Official Statement to the 1978 Trust Agreement, the Bond Resolution, the 2017 Bonds, the Continuing Disclosure Certificate and all other agreements, statutes and instruments are qualified by reference to the complete document. Copies of the 1978 Trust Agreement and the Bond Resolution are available for examination at the offices of the Authority and the Trustee.

The Authority’s principal office is located at One Harborside Drive, Suite 200S, East Boston, Massachusetts 02128-2909. Its telephone number is (617) 568-5000. Questions may be directed to Anna M. Tenaglia, Director of Treasury, at [atenaglia@massport.com](mailto:atenaglia@massport.com). Copies of certain documents, including the Authority’s Comprehensive Annual Financial Report for fiscal year 2016, which has been awarded the Certificate of Achievement for Excellence in Financial Reporting by the Government Finance Officers Association, are available electronically at the investors’ page of the Authority’s website at:

<http://www.massport.com/about-massport/investor-relations>

However, no information on the Authority’s website is a part of or incorporated into this Official Statement, except to the extent such information is expressly disclosed herein.

## THE 2017 BONDS

### General Provisions

The 2017 Bonds will be issued as fully registered bonds in the aggregate principal amounts as set forth on page (i) hereof, will be dated their date of initial delivery and will bear interest from that date to their respective maturities as set forth on page (i) hereof, subject to optional and mandatory sinking fund redemption prior to maturity as described below. Ownership interests in the 2017 Bonds will be available in denominations of \$5,000 and integral multiples thereof. Interest on the 2017 Bonds will be payable on January 1, 2018 and on each July 1 and January 1 thereafter.

So long as Cede & Co. is the registered owner of the 2017 Bonds, all payments of principal, premium, if any, and interest on the 2017 Bonds are payable by wire transfer by the Trustee to Cede & Co., as nominee for DTC, which will, in turn, remit such amounts to the DTC Participants (as defined herein) for subsequent disposition to Beneficial Owners (as defined herein). See “Book-Entry Only Method” below.

### Redemption

**Sinking Fund Installments.** The 2017 Bonds described below will be subject to redemption from sinking fund installments on the dates and in the amounts set forth below, which may be satisfied (i) by purchase and immediate subsequent cancellation by May 15 in each year at not more than 100% (unless another price is set by the Authority) of the principal amount, or (ii) by redemption on July 1 in each year by lot at 100% of the principal amount to be redeemed, in each case together with accrued interest to the purchase or redemption date.



**Sinking Fund Installments  
2017 Bonds Maturing July 1, 2042**

<u>Year</u>	<u>Principal Amount</u>
2038	\$3,780,000
2039	3,970,000
2040	4,165,000
2041	4,375,000
2042 <sup>†</sup>	4,595,000

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<sup>†</sup> Maturity

**Sinking Fund Installments  
2017 Bonds Maturing July 1, 2047**

<u>Year</u>	<u>Principal Amount</u>
2043	\$4,825,000
2044	5,065,000
2045	5,320,000
2046	5,585,000
2047 <sup>†</sup>	5,865,000

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<sup>†</sup> Maturity

**Optional Redemption.** The 2017 Bonds maturing on or prior to July 1, 2027 will not be subject to optional redemption prior to their respective maturity dates. The 2017 Bonds maturing after July 1, 2027 will be redeemable at the option of the Authority, in the order of maturity or sinking fund installments as directed by the Authority, on or after July 1, 2027, in whole or in part on any date, by lot within any single maturity or sinking fund installment, at 100% of the principal amount to be redeemed, together with accrued interest to the purchase or redemption date.

**Selection of 2017 Bonds to Be Redeemed.** If fewer than all the 2017 Bonds of any maturity or sinking fund installment are to be redeemed, the Trustee will select the 2017 Bonds of such maturity or sinking fund installment to be redeemed by lot; provided, however, that so long as DTC or its nominee is the Bondholder, the particular portions of the 2017 Bonds to be redeemed within a maturity or sinking fund installment shall be selected by DTC in such manner as DTC may determine. For this purpose, the Trustee will consider each 2017 Bond in a denomination larger than the minimum Authorized Denomination permitted by the Bond Resolution at the time to be separate 2017 Bonds each in the minimum Authorized Denomination.

**Notice of Redemption.** During the period that DTC or DTC's partnership nominee is the registered owner of the 2017 Bonds, the Trustee shall not be responsible for mailing notices of redemption to the Beneficial Owners (as defined herein) of the 2017 Bonds. See "Book-Entry Only Method" below. Not less than 30 nor more than 60 days before any redemption date, notice of the redemption will be filed with the Paying Agents of the 2017 Bonds and mailed to the holders of the 2017 Bonds (DTC or DTC's partnership nominee, as long as the 2017 Bonds are so registered) to be redeemed in whole or in part at their address as shown on the registration books of the Trustee. Failure to mail any notice of redemption, however, will not affect the validity of the proceedings for such redemption. If at the time of notice of any optional redemption of 2017 Bonds moneys sufficient to redeem all of such 2017 Bonds shall not have been deposited or set aside as provided in the 1978 Trust Agreement, then the notice of redemption may state that it is conditional on the deposit of sufficient moneys by not later than one business day prior to the redemption date, and if the deposit is not timely made the notice shall be of no effect. The Trustee may make other arrangements with respect to the manner of giving notices of redemption to Bondholders of record or Beneficial Owners of the 2017 Bonds, as provided in the Bond Resolution.

## Book-Entry Only Method

The Depository Trust Company (“DTC”), New York, New York, will act as securities depository for the 2017 Bonds. The 2017 Bonds will be issued in fully-registered form registered in the name of Cede & Co. (DTC’s partnership nominee) or such other name as may be requested by an authorized representative of DTC. One fully-registered certificate will be issued for each maturity of the 2017 Bonds, each in the aggregate principal amount of such maturity, and each such certificate will be deposited with DTC.

DTC, the world’s largest securities depository, is a limited-purpose trust company organized under the New York Banking Law, a “banking organization” within the meaning of the New York Banking Law, a member of the Federal Reserve System, a “clearing corporation” within the meaning of the New York Uniform Commercial Code, and a “clearing agency” registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds and provides asset servicing for over 3.5 million issues of U.S. and non-U.S. equity issues, corporate and municipal debt issues, and money market instruments (from over 100 countries) that DTC’s participants (“*Direct Participants*”) deposit with DTC. DTC also facilitates the post-trade settlement among Direct Participants of sales and other securities transactions in deposited securities, through electronic computerized book-entry transfers and pledges between Direct Participants’ accounts. This eliminates the need for physical movement of securities certificates. Direct Participants include both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations. DTC is a wholly-owned subsidiary of The Depository Trust & Clearing Corporation (“DTCC”). DTCC is the holding company for DTC, National Securities Clearing Corporation and Fixed Income Clearing Corporation, all of which are registered clearing agencies. DTCC is owned by the users of its regulated subsidiaries. Access to the DTC system is also available to others such as both U.S. and non-U.S. securities brokers and dealers, banks, trust companies, and clearing corporations that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly (“*Indirect Participants*”). The DTC Rules applicable to its Participants are on file with the Securities and Exchange Commission. More information about DTC can be found at [www.dtcc.com](http://www.dtcc.com).

Purchases of 2017 Bonds deposited with DTC must be made by or through Direct Participants, which will receive a credit for such 2017 Bonds on DTC’s records. The ownership interest of each actual purchaser of each 2017 Bond deposited with DTC (“*Beneficial Owner*”) is in turn to be recorded on the Direct and Indirect Participants’ records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in 2017 Bonds deposited with DTC are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in 2017 Bonds deposited with DTC, except in the event that use of the book-entry system for such 2017 Bonds is discontinued.

To facilitate subsequent transfers, all 2017 Bonds deposited by Direct Participants with DTC are registered in the name of DTC’s partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of 2017 Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the 2017 Bonds deposited with it; DTC’s records reflect only the identity of the Direct Participants to whose accounts such 2017 Bonds are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time.

Redemption notices shall be sent to DTC. If less than all of a maturity of 2017 Bonds is being redeemed, DTC’s practice is to determine by lot the amount of the interest of each Direct Participant in such maturity to be redeemed.

Neither DTC nor Cede & Co. (nor such other DTC nominee) will consent or vote with respect to 2017 Bonds deposited with it unless authorized by a Direct Participant in accordance with DTC's MMI Procedures. Under its usual procedures, DTC mails an Omnibus Proxy to the Authority or the Trustee as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts the 2017 Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Principal and interest payments on 2017 Bonds deposited with DTC will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit Direct Participants' accounts upon DTC's receipt of funds and corresponding detail information from the Authority or the Trustee, on the payable date in accordance with their respective holdings shown on DTC's records. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with 2017 Bonds held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participant and not of DTC (nor its nominee), the Authority or the Trustee, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of principal and interest to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of the Authority or the Trustee, disbursement of such payments to Direct Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners will be the responsibility of Direct and Indirect Participants.

DTC may discontinue providing its services as depository with respect to 2017 Bonds held by it at any time by giving reasonable notice to the Authority or the Trustee. Under such circumstances, in the event that a successor depository is not obtained, physical certificates are required to be printed and delivered to Beneficial Owners.

The Authority may decide to discontinue use of the system of book-entry transfers through DTC (or a successor securities depository). In that event, 2017 Bond certificates will be printed and delivered to DTC.

The information in this section concerning DTC and DTC's book-entry system has been obtained from sources that the Authority believes to be reliable, but the Authority takes no responsibility for the accuracy thereof.

So long as Cede & Co. is the registered owner of the 2017 Bonds as nominee of DTC, references herein to the holders or registered owners of the 2017 Bonds shall mean Cede & Co. and shall not mean the Beneficial Owners of the 2017 Bonds.

Neither of the Authority or the Trustee will have any responsibility or obligation to the Participants of DTC or the persons for whom they act as nominees with respect to (i) the accuracy of any records maintained by DTC or by any Participant of DTC, (ii) payments or the providing of notice to the Direct Participants, the Indirect Participants or the Beneficial Owners, (iii) the selection by DTC or by any Participant of DTC of any Beneficial Owner to receive payment in the event of a partial redemption of the 2017 Bonds or (iv) any other action taken by DTC or its partnership nominee as owner of the 2017 Bonds.

### **Transfer of 2017 Bonds**

So long as Cede & Co., as nominee for DTC (or other nominee of DTC), is the Bondholder of record of the 2017 Bonds, beneficial ownership interests in the 2017 Bonds may be transferred only through a Direct Participant or Indirect Participant and recorded on the book-entry system operated by DTC. In the event the book-entry-only system is discontinued, 2017 Bond certificates will be delivered to the Beneficial Owners as described in the Bond Resolution. Thereafter, the 2017 Bonds, upon surrender thereof at the principal office of the Trustee with a written instrument of transfer satisfactory to the Trustee, duly executed by the holder thereof or such holder's duly authorized attorney, may be exchanged for an equal aggregate principal amount of 2017 Bonds of the same maturity and of any Authorized Denominations.

In all cases in which the privilege of exchanging or transferring 2017 Bonds is exercised, the Authority shall execute and the Trustee shall authenticate and deliver the 2017 Bonds in accordance with the provisions of the 1978 Trust Agreement. For every such exchange or transfer of 2017 Bonds, the Authority or the Trustee may make

a charge sufficient to reimburse it for any tax, fee or other governmental charge required to be paid with respect to such exchange or transfer but may impose no other charge therefor. Neither the Authority nor the Trustee shall be required to make any such exchange or transfer of 2017 Bonds during the 15 days next preceding an Interest Payment Date or, in the case of any proposed redemption, during the 15 days next preceding the first publication or mailing of notice of redemption.

### ESTIMATED SOURCES AND USES OF FUNDS

The estimated sources and uses of funds in connection with the issuance of the 2017 Bonds are summarized below:

**Sources of Funds**

Principal of the 2017 Bonds	\$169,500,000.00
Plus: Original Issue Premium	27,248,054.70
Amounts Available under the 1978 Trust Agreement	<u>3,534,559.01</u>
Total	\$200,282,613.71

**Uses of Funds**

Deposit to Construction Fund for Project Costs	\$91,009,097.51
Deposit to Construction Fund for Capitalized Interest	11,325,730.80
Deposit to Reserve Account	1,499,607.76
Refund Refunded Bonds	94,950,884.76
Costs of Issuance <sup>1</sup>	903,950.00
Underwriters' Discount	<u>593,342.88</u>
Total	\$200,282,613.71

<sup>1</sup> Includes Trustee fees, the Authority's legal fees, rating agency fees, printing expenses and other miscellaneous fees and expenses.

### PLAN OF FINANCE

The 2017 Bonds are being issued to finance a portion of the Authority's FY17-FY21 Capital Program. See APPENDIX A – Information Statement of the Authority – Capital Program.

In addition, a portion of the proceeds of the 2017 Bonds, plus available funds held under the 1978 Trust Agreement, will be used to refund (i) all of the Authority's currently outstanding Revenue Refunding Bonds, Series 2007-C (the "*Refunded 2007-C Bonds*") on a current basis and (ii) all of the Authority's currently outstanding Multi-Modal Revenue Refunding Bonds, Series 2010-D (the "*Refunded 2010-D Bonds*," and together with the Refunded 2007-C Bonds, the "*Refunded Bonds*") on a current basis, each as described in more detail in the table captioned "Refunded Bonds" below. The proceeds of the 2017 Bonds being used to current refund the Refunded Bonds will be deposited in the Redemption Account established under the 1978 Trust Agreement and will be applied to the payment of the principal or redemption price of and interest on the Refunded Bonds on the first business day after the issuance of the 2017 Bonds as may be permissible under the 1978 Trust Agreement.

### Refunded Bonds

<u>Series</u>	<u>Original Maturity</u> <u>July 1</u>	<u>CUSIP</u> <sup>†</sup>	<u>Amount to</u> <u>Be Refunded</u>	<u>Redemption</u> <u>Date</u>	<u>Redemption</u> <u>Price</u>
2007-C	2022	575896 DR3	\$9,640,000	7/20/2017	100%
	2027	575896 DS1	<u>12,315,000</u>	7/20/2017	100
			<b>\$21,955,000</b>		
2010-D	2029	575896 JD8	<u>\$72,900,000</u>	7/20/2017	100%
			<b>\$72,900,000</b>		

<sup>†</sup> The CUSIP numbers listed above are being provided solely for the convenience of Bondholders. The Authority does not make any representation with respect to such numbers or undertake any responsibility for their accuracy now or at any time in the future.

### SECURITY FOR THE 2017 BONDS

#### General

The principal of, premium, if any, and interest on the 2017 Bonds and each of the 2007 Bonds, the 2008 Bonds, the 2010 Bonds, the 2012 Bonds, the 2014 Bonds, the 2015 Bonds and the 2016 Bonds (each as described in the table below, some of which series of Bonds are expected to be refunded in whole or in part by the 2017 Bonds, as described in the table below and in “PLAN OF FINANCE” above), and any additional Bonds that may be issued hereafter under the 1978 Trust Agreement, are payable from, and secured by a pledge of, the Authority’s Revenues, which include all tolls, rates, fees, rentals and other charges from its Projects (subject to limited exclusions) and certain investment income and other revenues, all as more fully described in APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement. For information about historical Revenues, see APPENDIX A – Information Statement of the Authority – Selected Financial Data. The pledge of the Revenues is subject to the provisions of the 1978 Trust Agreement regarding the application of Revenues. See “Flow of Funds” below. Exclusions from Revenues pledged to secure the Bonds include (i) passenger facility charges (“PFCs”) assessed by the Authority on eligible enplaning passengers at the Airport, (ii) customer facility charges (“CFCs”) charged to rental car patrons and (iii) certain revenues derived from facilities financed by debt that has limited recourse to the Authority. See below under “– Passenger Facility Charges” and “– Customer Facility Charges” and APPENDIX A – Other Obligations – PFC Revenue Bonds, – CFC Revenue Bonds and – Special Facilities Revenue Bonds.

As of the date of this Official Statement, before giving effect to the issuance of the 2017 Bonds and the refunding of the Refunded Bonds, the Authority has outstanding under the 1978 Trust Agreement 16 Series of Bonds in the aggregate principal amount of \$1,340,755,000, consisting of the Series listed in the following table.

**BONDS OUTSTANDING UNDER THE 1978 TRUST AGREEMENT  
BEFORE GIVING EFFECT TO THE ISSUANCE OF THE 2017 BONDS AND  
THE REFUNDING OF THE REFUNDED BONDS**

<u>Series</u>	<u>Issued</u>	<u>Amount Outstanding</u>
Revenue Refunding Bonds, Series 2007-C (AMT) *	June 2007	\$21,955,000
Revenue Refunding Bonds, Series 2008-C (Non-AMT)	July 2008	7,830,000
Revenue Bonds, Series 2010-A (Non-AMT)	August 2010	88,025,000
Revenue Refunding Bonds, Series 2010-B (Non-AMT)	August 2010	126,310,000
Revenue Refunding Bonds, Series 2010-C (AMT)	August 2010	3,810,000
Multi-Modal Revenue Refunding Bonds, Series 2010-D (AMT) *	August 2010	72,900,000
Revenue Bonds, Series 2012-A (AMT)	July 2012	90,330,000
Revenue Refunding Bonds, Series 2012-B (Non-AMT)	July 2012	156,405,000
Revenue Bonds, Series 2014-A (Non-AMT)	July 2014	44,630,000
Revenue Bonds, Series 2014-B (AMT)	July 2014	47,375,000
Revenue Refunding Bonds, Series 2014-C (Non-AMT)	July 2014	136,840,000
Revenue Bonds, Series 2015-A (Non-AMT)	July 2015	104,480,000
Revenue Bonds, Series 2015-B (AMT)	July 2015	67,005,000
Revenue Refunding Bonds, Series 2015-C (Non-AMT)	June 2015	142,895,000
Revenue Refunding Bonds, Series 2016-A (Non-AMT)	July 2016	49,680,000
Revenue Bonds, Series 2016-B (AMT)	July 2016	<u>180,285,000</u>
Total		<u>\$1,340,755,000</u>

\* All the 2007-C Bonds and the 2010-D Bonds constitute the Refunded Bonds. See “PLAN OF FINANCE” herein.

The Bonds on the foregoing list are the only Bonds currently outstanding under the 1978 Trust Agreement. All of the Bonds on the foregoing list are fixed rate bonds except for the 2010-D Bonds, which are variable rate bonds supported by an irrevocable letter of credit issued by a bank. See Note 5 to the Authority’s financial statements attached hereto as APPENDIX B. For a description of the Authority’s subordinated obligations, also issued under the 1978 Trust Agreement but not on parity with the Bonds, see APPENDIX A – Information Statement of the Authority – Other Obligations – Subordinated Revenue Bonds. For a description of other obligations of the Authority not issued on a parity with the Bonds, see APPENDIX A – Information Statement of the Authority – Other Obligations.

The Authority has no power to levy any taxes or pledge the credit or create any debt of the Commonwealth or any political subdivision thereof. The Authority’s Bonds and certain other obligations are payable only out of Revenues of the Authority as described herein or the proceeds of Bonds subsequently issued, and are not debts of the Commonwealth or of any such subdivision, nor are they guaranteed by any of them. Under the Enabling Act and the 1978 Trust Agreement, the Authority does not have the power to mortgage the Airport Properties or the Port Properties, or any additional revenue-producing facilities hereafter acquired or constructed by the Authority or extensions, enlargements and improvements of the foregoing. Under its Enabling Act, the Authority has the power to acquire improvements to its Projects and, in certain instances, to sell property included in the Projects. Acquisitions of new facilities unrelated to the Projects and sales of all or substantially all of any existing Project would require authorizing legislation.

**Flow of Funds**

The Authority’s pledge of its Revenues to secure the Bonds is subject to the provisions of the 1978 Trust Agreement regarding the application of Revenues. A brief description of the flow of funds of the Revenues is presented below. For a more detailed summary, see APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Application of Revenues.

The 1978 Trust Agreement provides that all Revenues are deposited daily in the Revenue Fund and are then transferred to the credit of the Operating Fund as soon and as often as practicable. The Authority shall pay when due all Operating Expenses from the Operating Fund and, once each month, shall transfer from the Operating Fund amounts, if any, to be deposited to its pension, post-retirement health benefits and self-insurance accounts. Any amounts deposited in the pension and post-retirement health benefit accounts will, upon the occurrence of an event of default under the 1978 Trust Agreement, first be applied to present and accrued pension benefits and post-retirement health benefits of the Authority's employees. See APPENDIX A – Information Statement of the Authority – General Operational Factors – Financial Considerations – Authority Pension Funding and APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Pledge Effected by the 1978 Trust Agreement.

The Authority retains in the Operating Fund as working capital such amounts as the Authority may determine necessary, provided that the balance therein shall not exceed 15% of the annual Operating Expenses established in the Authority's current annual budget. The balance of the Operating Fund is transferred monthly to the Trustee and applied as follows:

(a) First, to deposit to the credit of the Bond Service Account of the Interest and Sinking Fund, the amount required to make the balance of the Bond Service Account equal to the sum of the interest accrued and to accrue until the first day of the next month on all outstanding Bonds and the principal accrued and to accrue until the first day of the ensuing month of all serial Bonds, if any, which will become payable within the next twelve (12) months.

(b) Second, to deposit to the credit of the Redemption Account of the Interest and Sinking Fund, the amount, if any, required to make the amounts deposited in the Redemption Account for the current fiscal year equal to the portion of the Amortization Requirement, if any, for such fiscal year for the outstanding term Bonds of each Series, accrued and to accrue until the first day of the next month.

(c) Third, to deposit to the credit of the Reserve Account of the Interest and Sinking Fund (i) an amount, if any, equal to one-sixtieth (1/60th) of the difference, if any, between (x) the maximum annual Principal and Interest Requirements for all Bonds then outstanding at the time of issuance of each Series of additional Bonds, less (y) the amount deposited into the Reserve Account as of the issuance of such Series of Bonds until the balance in the Reserve Account is equal to the maximum annual Principal and Interest Requirements for all outstanding Bonds, (ii) any amount which may have been withdrawn from the Reserve Account for paying interest, maturing principal or meeting Amortization Requirements or deposits to any Term Bond Investment Account and not theretofore replenished and (iii) any outstanding deficiency in deposits to the Reserve Account.

(d) Fourth, to deposit to the credit of the Maintenance Reserve Fund, the amount required to make the deposit in the Fund during such month equal to one-twelfth (1/12) of one percent (1%) of the Replacement Cost of all Projects of the Authority as determined by the Consulting Engineer for the then-current fiscal year, or a greater amount as may have been specified by the Authority in its annual budget for the fiscal year (not to exceed in any fiscal year five percent (5%) of the Replacement Cost of all Projects).

(e) Fifth, to deposit to the credit of the Payment in Lieu of Taxes Fund, the amount, if any, required to make the balance of the Payment in Lieu of Taxes Fund equal to the amount that should be on deposit therein, assuming that the amounts payable on the respective next following payment dates pursuant to the in-lieu-of tax agreements referred to in the 1978 Trust Agreement were paid in equal monthly installments from each respective preceding payment date.

(f) Sixth, to deposit to the credit of the Capital Budget Fund, the amount, if any, required to make the balance of the Capital Budget Fund equal to the sum of the remaining portion of the Capital Budget for the then-current fiscal year budgeted to be paid from the Capital Budget Fund plus all amounts in the Capital Budget Fund obligated with respect to prior fiscal years but not yet expended; provided, that the Authority by resolution may increase or reduce the amount otherwise required to be deposited in the Capital Budget Fund.

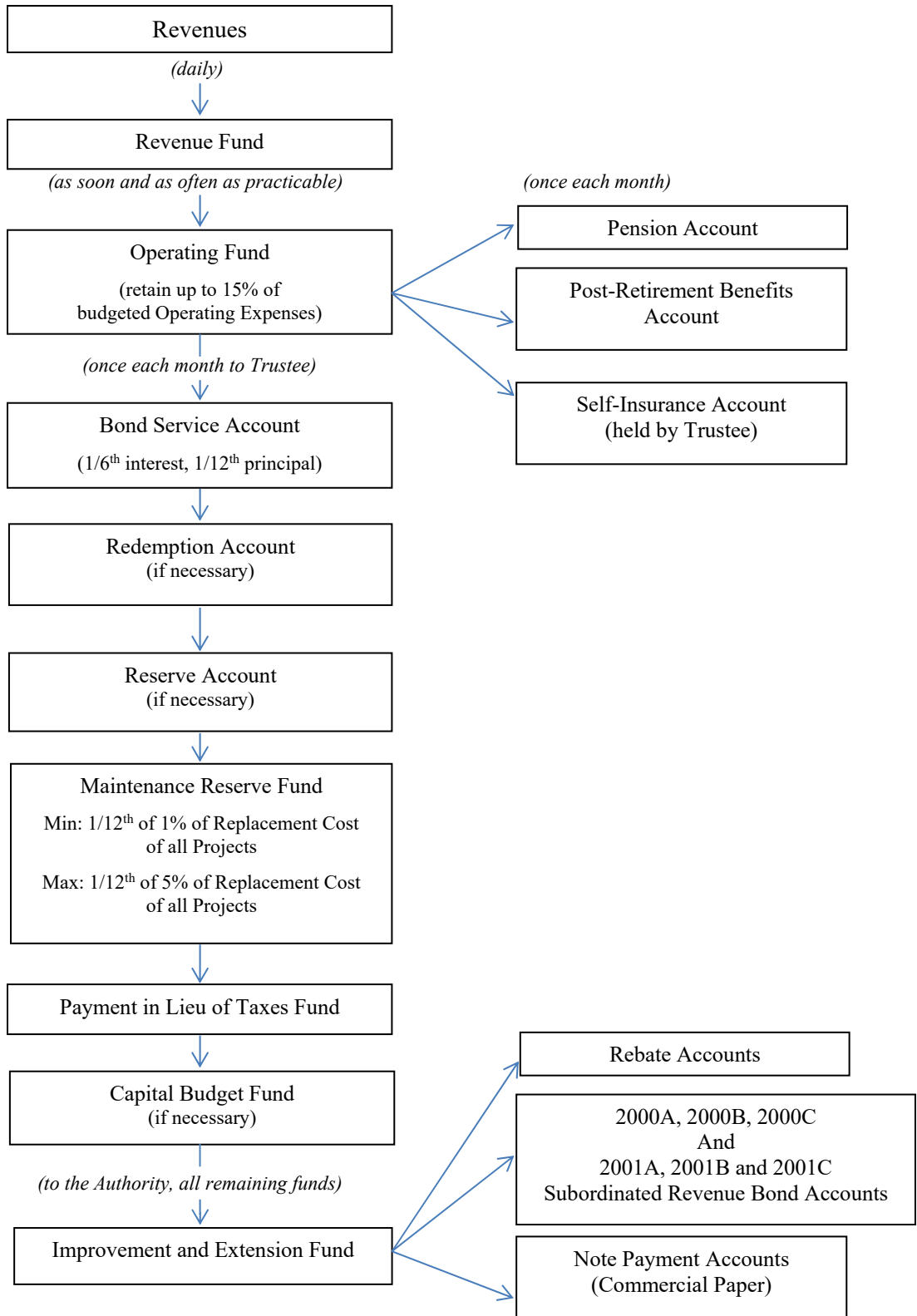
(g) Seventh, to the Authority for deposit to the credit of the Improvement and Extension Fund any amounts remaining in the Operating Fund after compliance with the above provisions. The 1978 Trust Agreement provides that moneys held in the Improvement and Extension Fund may be used for any lawful purpose of the Authority.

A chart summarizing the foregoing flow of funds is set forth on the following page.

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**APPLICATION OF REVENUES**



## **Covenants as to Fees and Charges**

The Authority covenants under the 1978 Trust Agreement to fix and revise as necessary the tolls, rates, fees, rentals and other charges for use of its Projects. The 1978 Trust Agreement requires that in each fiscal year Revenues be at least equal to the greater of (i) Operating Expenses plus 125% of debt service requirements for such year on all outstanding Bonds, and (ii) the sum of (A) Operating Expenses and debt service and reserve requirements on all outstanding Bonds, plus (B) amounts, if any, required to be deposited to the Maintenance Reserve Fund, the Payment in Lieu of Taxes Fund and the Capital Budget Fund, plus (C) amounts required to be deposited to the credit of the Improvement and Extension Fund pursuant to the Twelfth Supplemental Agreement between the Authority and the Trustee (which was entered into in connection with the issuance of the Subordinate Bonds), made pursuant to the 1978 Trust Agreement. See APPENDIX A – Information Statement of the Authority – Other Obligations – Subordinated Revenue Bonds. In addition, the Authority has covenanted to set tolls, rates, fees, rentals and other charges sufficient to reimburse the letter of credit provider under the Authority’s commercial paper program. If in any year Revenues are less than the amount required, the Authority is required to cause recognized experts to recommend revised schedules of rates and charges and, if the Authority shall comply with all such recommendations, the failure of Revenues to equal the amount specified will not, of itself, constitute a default under the 1978 Trust Agreement. See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Covenants as to Fees and Charges. See “SECURITY FOR THE 2017 BONDS – Modifications of the 1978 Trust Agreement” for certain proposed amendments to the 1978 Trust Agreement affecting the calculation of the debt service requirements on all outstanding Bonds.

## **Reserve Account**

The 1978 Trust Agreement establishes a Reserve Account within the Interest and Sinking Fund that secures all Bonds on a parity basis. Such Reserve Account shall be used to pay debt service on the Bonds secured thereby to the extent of deficiencies in the applicable Bond Service Account. As a result of the deposits previously made to the Reserve Account upon the issuance of Bonds under the 1978 Trust Agreement, plus subsequent monthly deposits, the balance in such Reserve Account as of March 31, 2017 was approximately \$114.3 million. The balance in the Reserve Account is currently held in cash and Investment Securities (as that term is defined in the 1978 Trust Agreement). It is the Authority’s policy to fund its reserve funds with cash and cash equivalents; the Authority has not used any surety policies to fund the debt service reserve funds for any of its Bonds. Upon issuance of any additional Bonds (other than certain refunding Bonds), the 1978 Trust Agreement requires that there be deposited to the Reserve Account an amount at least equal to one-half of the difference between (a) the amount of the increase in the maximum annual debt service requirement on such Bonds and all then-outstanding Bonds and (b) the amount, if any, in the Reserve Account in excess of the maximum annual debt service requirement on all then-outstanding Bonds.

A portion of the Reserve Account requirement applicable to the 2017 Bonds will be funded with proceeds of the 2017 Bonds. At the time of issuance of the 2017 Bonds, the Reserve Account is expected to be fully funded with respect to all outstanding Bonds (including the 2017 Bonds and after giving effect to the refunding of the Refunded Bonds). See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Application of Revenues.

See “SECURITY FOR THE 2017 BONDS – Modifications of the 1978 Trust Agreement” for certain proposed amendments to the 1978 Trust Agreement affecting the Reserve Account.

## **Permitted Investments**

Moneys held for the credit of the funds and accounts established under the 1978 Trust Agreement may, with certain exceptions, be invested only in “Investment Securities” as defined in the 1978 Trust Agreement. See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Certain Definitions. The exceptions are that moneys held for the credit of any special separate pension account in the Operating Fund may be invested in such manner as provided in the resolution of the Authority establishing such account, and that moneys held for the credit of certain other accounts may be invested solely in Government Obligations. See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Investments in Funds and Accounts. For a

description of the Authority's investment policy, see APPENDIX A – Information Statement of the Authority – General Operational Factors – Investment Policy.

### **Additional Bonds**

Under the 1978 Trust Agreement the Authority may, on the fulfillment of certain conditions, issue additional Bonds. The Enabling Act does not limit the amount of additional Bonds that may be issued by the Authority. Bonds may be issued under provisions of the 1978 Trust Agreement to finance, among other things, the cost of acquiring and constructing Additional Facilities and Additional Improvements and to refund outstanding Bonds. These provisions of the 1978 Trust Agreement permit the issuance of a series of additional Bonds if, among other conditions, the Authority complies with one or more tests based on historical or projected Net Revenues and debt service requirements. See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Issuance of Additional Bonds.

In connection with the issuance of the 2017 Bonds, the following test will be applicable: that the Net Revenues of the Authority (the excess of Revenues over Operating Expenses during the applicable period) for any 12 consecutive months of the last 18 months have been at least 125% of the maximum annual Principal and Interest Requirements on all outstanding Bonds, after giving effect to the issuance of the 2017 Bonds and the refunding of the Refunded Bonds (and any subsequent additional Bonds estimated to be issued under the 1978 Trust Agreement to complete Additional Improvements or Additional Facilities partially financed by Bonds then outstanding). For the purpose of this calculation, annual Principal and Interest Requirements on outstanding Bonds means, for any fiscal year of the Authority, interest accrued on such Bonds during such fiscal year, excluding interest for such period paid or to be paid from the Construction Fund, and maturing principal and mandatory amortization requirements due and payable on the July 1 immediately following such fiscal year. In the case of Bonds that bear interest at a variable rate, the interest component of maximum annual Principal and Interest Requirements is computed at the rate estimated by a nationally known investment banking firm selected by the Authority as the rate at which such Bonds would bear interest if issued at par with a fixed rate of interest and the same maturity. See “SECURITY FOR THE 2017 BONDS – Modifications of the 1978 Trust Agreement” for certain proposed amendments to the 1978 Trust Agreement affecting the calculation of Principal and Interest Requirements on all outstanding Bonds.

Coverage for purposes of the additional Bonds test described in the preceding paragraph was 293%, based upon (i) Net Revenues for the 12 months ended March 31, 2017 of \$331.7 million and (ii) maximum annual Principal and Interest Requirements of approximately \$113.3 million, determined as described above, after giving effect to the issuance of the 2017 Bonds, the anticipated refunding of the Refunded Bonds and the expected issuance of additional Bonds to complete Additional Improvements partially funded with the 2017 Bonds.

### **Other Revenues of the Authority Not Pledged as Security for the Bonds**

***Passenger Facility Charges.*** Under the 1978 Trust Agreement, PFCs assessed by the Authority on eligible enplaning passengers at the Airport have been excluded from Revenues at the election of the Authority, and the proceeds of PFCs are collected, held and expended outside the Funds and Accounts established under the 1978 Trust Agreement, and are not security for the Bonds. See APPENDIX A – Information Statement of the Authority – Capital Program – Funding Sources. For a description of certain revenue bonds issued by the Authority and secured by PFCs (collectively, the “PFC Revenue Bonds”), none of which are expected to remain outstanding after July 1, 2017, see APPENDIX A – Information Statement of the Authority – Other Obligations – PFC Revenue Bonds. The PFC Revenue Bonds are not issued under or secured by the 1978 Trust Agreement. The Authority plans to continue to leverage its PFC revenue stream after July 1, 2017 and is currently studying alternatives for accomplishing this objective in the most efficient and effective way. The current capital program assumes that the Authority will issue additional debt that will be paid from PFC revenues to finance \$171.3 million of project costs. See APPENDIX A – Information Statement of the Authority – Capital Program – Funding Sources – Passenger Facility Charges. See “SECURITY FOR THE 2017 BONDS – Modifications of the 1978 Trust Agreement” for certain proposed amendments to the 1978 Trust Agreement affecting application of PFCs to pay Bonds issued under the 1978 Trust Agreement.

**Customer Facility Charges.** In December 2008, the Authority instituted a CFC for each transaction day that a car is rented at Logan Airport. The purpose of the CFC is to fund the evaluation, design, financing and development of the Rental Car Center (“RCC”) and related facilities at the Airport, which opened in September 2013. On June 8, 2011, the Authority issued its first series of special facilities revenue bonds (the “CFC Revenue Bonds”) under a Trust Agreement dated as of May 18, 2011 (the “CFC Trust Agreement”) by and between the Authority and U.S. Bank National Association, as trustee, for the purpose of providing funds sufficient, together with other available funds, to finance the development and construction of the RCC and related improvements. Pursuant to the CFC Trust Agreement, the CFC revenues are pledged as security for the CFC Revenue Bonds, and the CFC revenues are not included in Revenues securing the 2017 Bonds and other Bonds issued under the 1978 Trust Agreement. For a further description of the RCC and the CFC Revenue Bonds, see (i) APPENDIX A – Information Statement of the Authority – Airport Properties – Airport Facilities – Service and Support Facilities and (ii) APPENDIX A – Information Statement of the Authority – Other Obligations – CFC Revenue Bonds. The CFC Revenue Bonds are not issued under or secured by the 1978 Trust Agreement. See “SECURITY FOR THE 2017 BONDS – Modifications of the 1978 Trust Agreement” for certain proposed amendments to the 1978 Trust Agreement affecting application of CFCs to pay Bonds issued under the 1978 Trust Agreement.

**Other Obligations and Commitments.** The Authority is permitted by the 1978 Trust Agreement to incur borrowings or issue other obligations, including bond anticipation notes issued in the form of commercial paper, that are generally subordinate to the rights of holders of the Bonds and are payable solely from moneys in the Improvement and Extension Fund, proceeds of borrowings or obligations subsequently incurred or issued and, in certain circumstances, Bonds subsequently issued. For a description of such borrowings, including the Authority’s commercial paper program, see APPENDIX A – Information Statement of the Authority – Other Obligations. The Authority has also issued special facilities revenue bonds for various capital projects on a non-recourse basis. The principal of and interest on the special facilities revenue bonds issued by the Authority are special obligations of the Authority, payable solely from the sources provided; none of such special facilities revenue bonds is secured by the Revenues of the Authority. For a description of these bonds, see APPENDIX A – Information Statement of the Authority – Other Obligations – Special Facilities Revenue Bonds.

**Additional Facilities.** The Authority may acquire or construct revenue-producing facilities (in addition to Additional Improvements to the Airport Properties or the Port Properties) that serve a public purpose as may hereafter be authorized by the Legislature of the Commonwealth. Under the 1978 Trust Agreement, the Authority may not construct, acquire or operate any other building, structure or other facility financed other than by additional Bonds, unless the Consulting Engineer files a statement to the effect that in their opinion the operation of such facility will not materially adversely affect the Net Revenues or impair the operating efficiency of the Projects taken as a whole. Such a statement was delivered by the Consulting Engineer in connection with the issuance of each series of non-recourse bonds issued by the Authority. See “Other Obligations and Commitments” above and APPENDIX A – Information Statement of the Authority – Other Obligations.

Separately, the 1978 Trust Agreement permits the Authority to contract with any municipality or political subdivision of the Commonwealth, or with any public agency or instrumentality thereof or of the United States of America or the Commonwealth, to provide for the construction, operation and maintenance and/or administration of any facility or improvement, whether or not connected with or made a part of the Airport Properties or the Port Properties, if permitted by law. The Authority may expend or contribute moneys for such purpose from the Improvement and Extension Fund, but only, in the case of construction, if the construction of such facility or improvement (i) will result in increasing the average annual Net Revenues of the Authority, during the period of sixty (60) months immediately following the placing of such facility or improvement in operation, by an amount not less than 5% of the amount of moneys to be so expended or contributed by the Authority, and (ii) will not impair the operating efficiency or materially adversely affect the Revenues of any Project.

### **Modifications of the 1978 Trust Agreement**

On several occasions commencing in 1988, the Authority has approved modifications to the 1978 Trust Agreement, which modifications either (i) were permissible under the terms of the 1978 Trust Agreement without Bondholder consent or (ii) took effect when approved by the holders of the requisite percentages of the outstanding Bonds. With respect to the modifications requiring Bondholder consent, the requisite percentage, in the case of most modifications, is 51% of the outstanding Bonds or, if fewer than all Series of Bonds are affected, 51% of the

outstanding Bonds of each affected Series. See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Modifications of the 1978 Trust Agreement.

By resolution adopted June 23, 2016, the Authority approved the Twenty-first Supplemental Agreement, which provides for certain additional modifications to the 1978 Trust Agreement (the “*Consent Amendments*”), which will take effect when approved by the holders of 51% of the outstanding Bonds of the Authority. Each initial purchaser of the 2017 Bonds will be required to execute a written consent to the adoption of the Consent Amendments, the form of which is attached to this Official Statement as APPENDIX F – Authority Request for Written Consent to Proposed Amendments. Such consent is irrevocable and shall be binding on the initial purchaser and all successors in interest to such initial purchaser. Upon receipt by the Authority and the Trustee of the written consent to the Consent Amendments by the holders of at least 51% in aggregate principal amount of the Outstanding Bonds, the Consent Amendments will be deemed to be adopted and will become effective. As of the date hereof, approximately 17.15% in aggregate principal amount of Outstanding Bonds have consented to the Consent Amendments. The Authority currently projects, based upon its current schedule for the issuance of Additional Bonds, receiving the consent of the requisite percentage of holders of Outstanding Bonds of the Authority to the Consent Amendments no earlier than calendar year 2018. However, it is not possible to predict the actual timing for receipt of the consent of the necessary percentage of holders, which could occur earlier than or subsequent to the currently anticipated timing.

The modifications to the 1978 Trust Agreement set forth in the Twenty-first Supplemental Agreement consist of the following:

- Allowing the Authority to determine that a Series of Bonds issued on or after the date the Twenty-first Supplemental Agreement becomes effective (the “*Effective Date*”) (i) shall be secured by the “Pooled Reserve Subaccount” within the Reserve Account on a parity with all Bonds outstanding on the Effective Date and all other Bonds so secured, or (ii) shall be secured by another subaccount within the Reserve Account and the amount required to be held within such subaccount to secure such additional Series of Bonds, or (iii) shall not be secured by a reserve subaccount.
- Providing that “Bullet Maturities” shall be deemed to be amortized over a period of up to 30 years for purposes of calculating “Principal and Interest Requirements” unless such maturity is within 12 months of the date of calculation. “Bullet Maturities” is defined as that portion of any Series of Bonds, 25% or more of the principal of which matures on the same date or within a fiscal year (other than Term Bonds), that matures on a single date or within such fiscal year. If such maturity is within 12 months of the date of calculation, then either (1) such maturity shall be taken into account in such calculation, or (2) upon receipt of a certificate of an authorized officer of the Authority (i) stating that the Authority intends to refinance such maturity, (ii) setting forth the probable terms of such refinancing and (iii) certifying that the debt capacity of the Authority is sufficient to successfully complete such refinancing, such Bullet Maturities shall be assumed to be refinanced in accordance with the probable terms set out in such certificate and such terms shall be used for purposes of calculating Principal and Interest Requirements, provided that such assumption shall be amortized over a term of not more than thirty (30) years from the date of refinancing.
- Providing that if PFCs, CFCs or other revenues of the Authority that do not constitute Revenues (collectively, “*Available Funds*”) shall be pledged or irrevocably committed or are held by the Trustee or another fiduciary and are to be set aside exclusively to be used to pay principal of, interest or premium, if any, on specified Bonds pursuant to a resolution of the Authority (and are not otherwise required for payment of another Series of Bonds), then the principal, interest and/or premium to be paid from such Available Funds or from earnings thereon shall be disregarded and not included in calculating Principal and Interest Requirements.
- Allows the Authority, by adoption of a resolution, to designate as “Revenues” Available Funds in an amount, for the period and subject to such conditions as may be provided by such resolution.

- Creating a new category of Consultant to the Authority and allowing such Consultant to perform certain duties currently delegated to the Authority’s Accountants, Consulting Engineers or Airport Consultants. The “Consultant” is defined as any Independent consultant, consulting firm (including the Airport Consultants), engineer (including the Consulting Engineers), architect, engineering firm, architectural firm, accountant or accounting firm (including the Accountants), financial advisory or investment banking firm, or other expert recognized to be well-qualified for work of the character required and retained by the Authority to perform acts and carry out the duties provided for such consultant in the Agreement, where “Independent” means a firm or individual (a) that does not have any direct financial interest or any material indirect financial interest in the operations of the Authority, other than the payment to be received under a contract for services to be performed, and (b) is not connected with the Authority as an official, officer or employee.
- Substituting notice posted on EMMA for publishing notice of redemption, defeasance, amendment of the 1978 Trust Agreement and resignation or replacement of the Trustee.
- Allowing notice to the Authority or Trustee to be delivered by courier or by hand.
- Permitting payments from the Construction Fund to be made by wire or ACH transfer.

By their acceptance of the 2017 Bonds, the owners thereof agree to all of the terms of the 1978 Trust Agreement as currently in effect and shall be required to execute a written consent to the adoption of the Consent Amendments. Copies of the 1978 Trust Agreement, marked to show the Consent Amendments authorized by the Twenty-first Supplemental Agreement are available on the Municipal Securities Rulemaking Board’s Electronic Municipal Market Access (“EMMA”) system or from the Authority’s Director of Treasury and from the Trustee. See “INTRODUCTION – Additional Information” above.

No proposed but unapproved modifications of the 1978 Trust Agreement other than the Consent Amendments are pending. The descriptions of provisions of the 1978 Trust Agreement contained in this Official Statement, including APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement, are inclusive of all modifications and amendments that have taken effect to date and the amendments described above.

## **TAX MATTERS**

In the opinion of Foley & Lardner LLP, Bond Counsel, based on existing laws, regulations, rulings and court decisions, and assuming, among other matters, compliance with certain covenants, as described herein, interest on the 2017 Bonds is excluded from gross income for federal income tax purposes under Section 103 of the Internal Revenue Code of 1986, as amended (the “Code”), except for interest on any 2017 Bond for any period during which such 2017 Bond is held by a person who is a “substantial user” of facilities financed with the proceeds of the 2017 Bonds or a “related person” of such a substantial user (within the meaning of Section 147(a) of the Code). In addition, interest on the 2017 Bonds is a specific preference item for purposes of the federal individual and corporate alternative minimum taxes. A copy of the proposed form of the opinion of Foley & Lardner LLP, as Bond Counsel, is set forth in APPENDIX H.

The Code imposes various restrictions, conditions and requirements relating to the exclusion from gross income for federal income tax purposes of interest on obligations such as the 2017 Bonds. The Authority has covenanted to comply with certain restrictions and requirements designed to assure that the interest on the 2017 Bonds will not be included in gross income for federal income tax purposes. Failure to comply with these covenants may result in such interest being included in gross income for federal income tax purposes, possibly from the original issuance date of the 2017 Bonds. The opinion of Foley & Lardner LLP, as Bond Counsel, assumes compliance with these covenants. Bond Counsel has not undertaken to determine (or to inform any person) whether any actions taken (or not taken) or events occurring (or not occurring) after the issuance of the 2017 Bonds may adversely affect the tax status of the interest on the 2017 Bonds. Accordingly, the opinion of Bond Counsel is not intended to, and may not, be relied upon in connection with any such actions, events or matters.

The opinion of Bond Counsel relies on factual representations made by the Authority and other persons. These factual representations include but are not limited to certifications by the Authority regarding its reasonable expectations regarding the use and investment of bond proceeds. Bond Counsel has not verified these representations by independent investigation. Bond Counsel does not purport to be an expert in asset valuation and appraisal, financial analysis, financial projections or similar disciplines. Failure of any of these factual representations to be correct may result in interest on the 2017 Bonds being included in gross income for federal income tax purposes, possibly from the original issuance dates of such 2017 Bonds.

Although Bond Counsel is of the opinion that interest on the 2017 Bonds is excluded from gross income for federal income tax purposes, the ownership or disposition of, or the accrual or receipt of interest on, the 2017 Bonds may otherwise affect a Beneficial Owner's federal tax liability. The nature and extent of these other tax consequences will depend upon the particular tax status of the Beneficial Owner or the Beneficial Owner's other items of income or deduction. Bond Counsel expresses no opinion regarding any such other tax consequences.

Current and future legislative proposals, if enacted into law, clarification of the Code or court decisions may cause interest on the 2017 Bonds to be subject, directly or indirectly, to federal income taxation or otherwise prevent the Beneficial Owners from realizing the full current benefit of the tax status of such interest. For example, from time to time, legislative proposals have been advanced which generally would limit the exclusion from gross income of interest on obligations like the 2017 Bonds to some extent for taxpayers who are individuals and whose income is subject to higher marginal tax rates. Other proposals have been made that could significantly reduce the benefit of, or otherwise affect, the exclusion from gross income of interest on obligations like the 2017 Bonds. The introduction or enactment of any such legislative proposals, clarification of the Code or court decisions may also affect, perhaps significantly, the market price for, or marketability of, the 2017 Bonds. Such future legislation, if enacted, possibly could apply to obligations issued before such legislation is enacted and some or all of the 2017 Bonds possibly could be treated for purposes of such future legislation as issued on one or more dates after the dates of original issuance of the 2017 Bonds. Prospective purchasers of the 2017 Bonds should consult their own tax advisors regarding any pending or proposed federal or state legislation, regulations or litigation, and regarding the impact of future legislation, regulations or litigations, as to which Bond Counsel expresses no opinion.

The opinion of Bond Counsel speaks only as of its date and is based on current legal authorities, covers certain matters not directly addressed by such authorities, and represents Bond Counsel's judgment regarding the proper treatment of the 2017 Bonds for federal income tax purposes. It is not binding on the Internal Revenue Service (the "IRS") or the courts, and it is not a guarantee of result. Furthermore, Bond Counsel cannot give and has not given any opinion or assurance about the future activities of the Authority or about the effect of changes to the Code, the applicable regulations, the interpretation thereof or the enforcement thereof by the IRS. The Authority has covenanted, however, to comply with the applicable requirements of the Code.

Bond Counsel is not obligated to defend the Authority regarding the tax-exempt status of the 2017 Bonds in the event of an examination by the IRS. Under current IRS procedures, the Beneficial Owners and parties other than the Authority would have little, if any, right to participate in an IRS examination of the 2017 Bonds. Moreover, because obtaining judicial review in connection with an IRS examination of tax-exempt bonds is difficult, obtaining independent review of IRS positions with which the Authority legitimately disagrees may not be practicable. Any action of the IRS, including but not limited to selection of the 2017 Bonds for examination, or the course or result of such an examination, or an examination of bonds presenting similar tax issues may affect the market price, or the marketability, of the 2017 Bonds, and may cause the Authority or the Beneficial Owners to incur significant expense.

Payments of interest on tax-exempt obligations, including the 2017 Bonds, are generally subject to IRS Form 1099-INT information reporting requirements. If a Beneficial Owner of a 2017 Bond is subject to backup withholding under those requirements, then payments of interest will also be subject to backup withholding. Those requirements do not affect the exclusion of such interest from gross income for federal income tax purposes.

*Premium.* 2017 Bonds purchased, whether at original issuance or otherwise, for an amount greater than their principal amount payable at maturity (or, in some cases, at their earlier call date) ("*Tax-Exempt Premium Bonds*") will be treated as having amortizable bond premium. No deduction is allowable for the amortizable bond premium in the case of bonds, like the Tax-Exempt Premium Bonds, the interest on which is excluded from gross

income for federal income tax purposes. However, the amount of tax exempt interest received, and a Beneficial Owner's basis in a Tax-Exempt Premium Bond, will be reduced by the amount of amortizable bond premium properly allocable to such Beneficial Owner. Beneficial Owners of Tax-Exempt Premium Bonds should consult their own tax advisors with respect to the proper treatment of amortizable bond premium in their particular circumstances.

### **State Tax Exemption**

In the opinion of Foley & Lardner LLP, Bond Counsel, under existing Massachusetts law, the 2017 Bonds, their transfer and the income therefrom (including any profit made on the sale thereof) are exempt from taxation within the Commonwealth. Bond Counsel expresses no opinion as to whether the 2017 Bonds or the interest thereon will be included in the measure of Massachusetts estate and inheritance taxes and certain Massachusetts tax consequences, or regarding tax consequences of states other than The Commonwealth of Massachusetts.

### **ELIGIBILITY FOR INVESTMENT**

The Enabling Act provides that the 2017 Bonds are eligible for investment by all Massachusetts insurance companies, trust companies in their commercial departments, banking associations, executors, trustees and other fiduciaries.

### **RATINGS**

The 2017 Bonds have been assigned ratings of "AA" (outlook: stable) by Fitch, Inc. ("*Fitch*"), "Aa2" (outlook: stable) by Moody's Investors Service ("*Moody's*") and "AA" (outlook: stable) by S&P Global Ratings ("*S&P*"), respectively. Such ratings reflect only the respective views of Fitch, Moody's and S&P, and an explanation of the significance of such ratings may be obtained from the rating agency furnishing the same. There is no assurance that such ratings will continue for any given period of time or that they will not be revised or withdrawn entirely by any or all of such rating agencies if, in its or their judgment, circumstances so warrant. Any such downward revision or withdrawal of such ratings may have an adverse effect on the market price of the 2017 Bonds.

### **FORWARD-LOOKING STATEMENTS**

If and when included in this Official Statement, the words "expects," "forecasts," "projects," "intends," "anticipates," "estimates" and analogous expressions are intended to identify forward-looking statements as defined in the Securities Act of 1933, as amended, and any such statements inherently are subject to a variety of risks and uncertainties that could cause actual results to differ materially from those projected. Such risks and uncertainties include, among others, general economic and business conditions, changes in political, social and economic conditions, regulatory initiatives and compliance with governmental regulations, litigation and various other events, conditions and circumstances affecting airports and the airline industry, seaports, maritime and commercial real estate, many of which are beyond the control of the Authority. These forward-looking statements speak only as of the date of this Official Statement. The Authority disclaims any obligation or undertaking to release publicly any updates or revisions to any forward-looking statement contained herein to reflect any change in the Authority's expectations with regard thereto or any change in events, conditions or circumstances on which any such statement is based.

### **CERTAIN LEGAL MATTERS**

The unqualified approving opinion of Foley & Lardner LLP, Boston, Massachusetts, Bond Counsel to the Authority, will be furnished upon delivery of the 2017 Bonds; the proposed form of such opinion is set forth in APPENDIX H. Certain legal matters will be passed on for the Authority by Catherine M. McDonald, Esquire, its Chief Legal Counsel, and by Locke Lord LLP, Boston, Massachusetts, its Disclosure Counsel. Certain legal matters will be passed on for the Underwriters by their counsel, Hinckley, Allen & Snyder, LLP, Boston, Massachusetts.



## INDEPENDENT AUDITORS

The financial statements of the Authority as of and for the years ended June 30, 2016 and 2015 included in APPENDIX B of this Official Statement have been audited by Ernst & Young LLP, independent auditors, as stated in their report appearing therein.

The prospective financial information (forecasted Operating Results and Debt Service Coverage) included within this Official Statement and the appendices hereto was prepared by the Authority in accordance with accounting principles required by the 1978 Trust Agreement in order to show forecasted debt service coverage and ability to meet other required fund deposits; such information was not prepared with a view toward compliance with the guidelines established by the American Institute of Certified Public Accountants for preparation and presentation of prospective financial information. The prospective financial information included in this Official Statement has been prepared by and is the responsibility of the Authority's management. Neither Ernst & Young LLP nor any other independent auditor has examined, compiled, reviewed, audited or performed any procedures with respect to the accompanying forecast, and accordingly, neither Ernst & Young LLP nor any other independent auditor expresses an opinion or any other form of assurance with respect thereto.

## MARKET ANALYSIS AND REVIEW OF AIRPORT PROPERTIES NET REVENUES

The Airport Market Analysis set forth in APPENDIX C was prepared by ICF in connection with the issuance of the 2017 Bonds. Such report is set forth herein in reliance upon the knowledge and experience of such firm as airport consultants. ICF has consented to the inclusion of their report herein.

The Review of Airport Properties Net Revenues Forecasts set forth in APPENDIX D was prepared by LeighFisher in connection with the issuance of the 2017 Bonds. The review should be read in its entirety for an understanding of the forecasts and the key assumptions therein. Such review is set forth herein in reliance upon the knowledge and experience of such firm as airport financial consultants. LeighFisher has consented to the inclusion of their report herein.

## UNDERWRITING

The 2017 Bonds are being purchased by the underwriters listed on the cover page hereof (collectively, the "Underwriters"), for whom Barclays Capital Inc. is acting as representative. The Underwriters have agreed, subject to certain conditions, to purchase all of the 2017 Bonds from the Authority at an aggregate underwriters' discount from the initial public offering prices or yields set forth on page (i) hereof equal to \$593,342.88 and to reoffer such 2017 Bonds at public offering prices not higher than or at yields not lower than those set forth on page (i) hereof. The Underwriters are obligated to purchase all such 2017 Bonds if any are purchased. The obligation of the Underwriters to make each such purchase and any such reoffering will be subject to certain terms and conditions set forth in the purchase contract relating to the 2017 Bonds (the "Purchase Contract"), the approval of certain legal matters by counsel and certain other conditions.

The 2017 Bonds may be offered and sold by the Underwriters to certain dealers (including dealers depositing such 2017 Bonds in unit investment trusts or mutual funds, some of which may be managed by the Underwriters) and certain dealer banks and banks acting as agents at prices lower (or yields higher) than the public offering prices (or yields) set forth on page (i) of this Official Statement. Subsequent to such initial public offering, subject to the Purchase Contract, the Underwriters may change the public offering prices (or yields) as they may deem necessary in connection with the offering of such 2017 Bonds.

*The following language has been provided by the Underwriters named therein. The Authority takes no responsibility as to the accuracy or completeness thereof.*

Loop Capital Markets LLC, one of the Underwriters of the 2017 Bonds, has entered into a distribution agreement with UBS Financial Services, LLC ("UBS") for the retail distribution of certain securities offerings at the original issue prices. Pursuant to the distribution agreement, UBS will purchase 2017 Bonds from Loop Capital

Markets LLC at the original issue prices less a negotiated portion of the selling concession applicable to any 2017 Bonds that it sells.

Each of the Underwriters and their respective affiliates are full service financial institutions engaged in various activities, which may include securities trading, commercial and investment banking, financial advisory, investment management, principal investment, hedging, financing and brokerage activities. Certain of the Underwriters and their respective affiliates have, from time to time, performed, and may in the future perform, various investment banking services for the Authority for which they received or will receive customary fees and expenses. In the ordinary course of their various business activities, each of the Underwriters and their respective affiliates may make or hold a broad array of investments and actively trade debt and equity securities (or related derivative securities) and financial instruments (which may include bank loans and/or credit default swaps) for their own account and for the accounts of their customers and may at any time hold long and short positions in such securities and instruments. Such investment and securities activities may involve securities and instruments of the Authority.

One or more of the Underwriters may have from time to time entered into, and may in the future enter into, distribution agreements with other broker-dealers (that have not been designated by the Authority as Underwriters) for the distribution of the 2017 Bonds at the original issue prices. Such agreements generally provide that the relevant Underwriter will share a portion of its underwriting compensation or selling concession with such broker-dealers.

#### **FINANCIAL ADVISOR**

PFM Financial Advisors LLC (“*PFM*”) is serving as financial advisor to the Authority for the issuance of the 2017 Bonds. PFM is not obligated to undertake, and has not undertaken, either to make an independent verification of or to assume responsibility for, the accuracy, completeness, or fairness of the information contained in this Official Statement. PFM is an independent financial advisory firm and is not engaged in the business of underwriting, trading or distributing securities. PFM is a registered municipal advisor with the Securities and Exchange Commission and the Municipal Securities Rulemaking Board under the Dodd-Frank Act of 2010.

#### **CONTINUING DISCLOSURE**

##### **1978 Trust Agreement Information**

The Authority is required by the 1978 Trust Agreement to prepare, file with the Trustee and mail to all Bondholders of Record (DTC or DTC’s partnership nominee, as long as the 2017 Bonds are so registered), within 60 days of the end of each fiscal year, a report setting forth, among other things, the status of all funds and accounts created under the 1978 Trust Agreement, and to prepare, file with the Trustee and mail to all such Bondholders of Record within three months of the end of each fiscal year a report on the audit of the books and accounts of the Authority by the Authority’s independent public accountants. The Authority is also required by the 1978 Trust Agreement to send certain documents and reports to all Bondholders of Record. The Director of Administration and Finance of the Authority, or his or her designee from time to time, shall be the contact person on behalf of the Authority from whom the foregoing information, data and notices may be obtained. The name, address and telephone number of the initial contact person are John P. Prankevicius, Director of Administration and Finance and Secretary-Treasurer, Massachusetts Port Authority, One Harborside Drive, Suite 200S, East Boston, Massachusetts 02128-2909, Tel: (617) 568-5000.

##### **Continuing Disclosure Undertakings**

The Authority has undertaken for the benefit of the owners of the 2017 Bonds to provide certain continuing disclosure pursuant to the provisions of Rule 15c2-12(b)(5) under the Securities Exchange Act of 1934 (as amended, the “*Rule*”). Specifically, the Authority executed and delivered a Continuing Disclosure Certificate dated as of July 19, 2012 (the “*Continuing Disclosure Certificate*”) for the benefit of the owners of all Bonds (including the 2017 Bonds) issued by or on behalf of the Authority that are designated by the Authority as subject to and having the benefits of the Continuing Disclosure Certificate. The Continuing Disclosure Certificate requires the Authority to

provide, or cause to be provided, annual financial information and operating data and event notices with respect to the 2017 Bonds in accordance with the Rule. See APPENDIX G – Form of Continuing Disclosure Certificate.

In connection with the issuance of its PFC Revenue Bonds and its CFC Revenue Bonds, the Authority has agreed to provide annual updated data with respect to certain other information regarding the Authority and the Airport pursuant to a Continuing Disclosure Agreement dated as of May 6, 1999 between the Authority and The Bank of New York with respect to the PFC Revenue Bonds (the “*PFC CDA*”) and a Continuing Disclosure Certificate dated as of June 15, 2011 with respect to the CFC Revenue Bonds (the “*CFC Disclosure Certificate*”). The Authority has also previously undertaken for the benefit of the owners of its Bonds issued prior to the 2017 Bonds certain continuing disclosure pursuant to a Continuing Disclosure Agreement dated as of August 1, 1997 (the “*1997 CDA*”) between the Authority and U.S. Bank National Association (as successor-in-interest to State Street Bank and Trust Company).

In order to provide certain continuing disclosure with respect to its Bonds previously issued under the 1978 Trust Agreement, its PFC Revenue Bonds and CFC Revenue Bonds, the Authority entered into a Disclosure Dissemination Agent Agreement with Digital Assurance Certification, L.L.C. (“*DAC*”), dated as of January 8, 2010. The Authority shall amend the Disclosure Dissemination Agreement to include coverage of the 2017 Bonds by this agreement.

For fiscal year 2015, when the Annual Filing was filed as part of the Authority’s Comprehensive Annual Financial Report (“*CAFR*”), fiscal year 2015 data in one of the appendices pertaining to the CFC Revenue Bonds was available only from July 2014 through March 2015. The Authority supplemented such appendix when the information became available to include data from July 2014 through June 2015, which supplemental information was filed on April 22, 2016. Similarly, for fiscal year 2016, when the Annual Filing was filed as part of the *CAFR*, fiscal year 2016 data in one of the appendices pertaining to the CFC Revenue Bonds was available only from July 2015 through March 2016. The Authority supplemented such appendix when the information became available to include data from July 2015 through June 2016, which supplemental information was filed on April 10, 2017.

In addition, during the last five years, certain notices regarding changes in short-term ratings on its outstanding variable rate Bonds due to changes in the respective credit provider ratings were not filed; and certain notices regarding changes in ratings on certain of the insured Bonds with respect to bond insurer rating downgrades either were not filed or were not timely filed. In the case of the bond insurer rating downgrades, in each instance the downgrade resulted in the rating on the insured Bonds being identical to the underlying rating of the Authority. The Authority has put in place policies and procedures designed to help ensure compliance with its continuing disclosure obligations.

The execution and delivery of this Official Statement have been duly authorized by the Authority.

**MASSACHUSETTS PORT AUTHORITY**

By: /s/ Michael P. Angelini  
Michael P. Angelini, Chairman

By: /s/ Thomas P. Glynn  
Thomas P. Glynn, Chief Executive Officer and Executive Director

APPENDIX A

INFORMATION STATEMENT OF THE AUTHORITY

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## THE AUTHORITY

### Purpose

This Information Statement provides certain information concerning the Massachusetts Port Authority (the “*Authority*”) in connection with the sale by the Authority of its Revenue Bonds, Series 2017-A (AMT) (the “*2017 Bonds*”). Capitalized terms not defined in this Appendix A are used as defined in the Official Statement, except as otherwise noted herein. The 2017 Bonds are being issued under the 1978 Trust Agreement and are secured solely by the Revenues pledged thereunder.

### The Authority

The Authority, created pursuant to Chapter 465 of the Massachusetts Acts of 1956, as amended to date (the “*Enabling Act*”), is a body politic and corporate and a public instrumentality of The Commonwealth of Massachusetts (the “*Commonwealth*” or “*Massachusetts*”). The Authority owns, operates and manages the following two Projects (as defined in the Enabling Act): the “*Airport Properties*,” which consist of Boston-Logan International Airport (the “*Airport*,” “*Logan*” or “*Logan Airport*”), Laurence G. Hanscom Field (“*Hanscom Field*”) and Worcester Regional Airport (“*Worcester Regional Airport*”); and the “*Port Properties*,” which consist of certain facilities in the Port of Boston (the “*Port*”) and other properties further described herein.

### Powers and Facilities

Under the Enabling Act, the Authority has general power, *inter alia* (a) to issue its revenue bonds and to borrow money in anticipation thereof, (b) to fix, revise, charge and collect tolls, rates, fees, rentals and charges for use of the Projects, (c) to maintain, repair and operate and to extend, enlarge and improve the Projects, and (d) to construct or acquire Additional Facilities (as defined in the Enabling Act) within the Commonwealth when authorized by the Legislature of the Commonwealth. The Authority has the power to acquire property by purchase or through the exercise of the right of eminent domain in certain circumstances. The Authority has no taxing power and generally receives no money from the Commonwealth’s budget.

The Authority’s facilities include the Airport Properties, consisting of the Airport, Hanscom Field and Worcester Regional Airport and the Port Properties, consisting of Moran Terminal, Hoosac Pier (site of Constitution Center), Mystic Piers 1, 48, 49 and 50 and the Medford Street Terminal, all of which are located in Charlestown; Conley Terminal, the North Jetty and Fargo Street Terminals, the former Army Base (including Cruiseport Boston), the Boston Fish Pier, Commonwealth Pier (site of World Trade Center Boston) and a portion of Commonwealth Flats, all of which are located in South Boston; and the East Boston Piers and the Boston Marine Works, both located in East Boston.

### Members and Management

The Enabling Act provides that the Authority shall consist of seven Members (collectively, the “*Board*”). Six Members are appointed by the Governor of the Commonwealth, including the Secretary of Transportation of the Commonwealth; the seventh member is appointed by the Massachusetts Port Authority Community Advisory Committee. Four Members of the Board constitute a quorum and the affirmative vote of four Members is necessary for any action taken by the Board. With the exception of the Secretary of Transportation, the Members are appointed for staggered seven-year terms. Members completing a term in office are eligible for reappointment and remain in office until their successors are appointed, except that any Member appointed to fill a vacancy shall serve only for the unexpired term. The Members of the Board serve without compensation, although they are reimbursed for expenses they incur in carrying out their duties.

The Chairman of the Board is elected annually by the Members. The Members also annually elect a Vice Chairman and a Secretary-Treasurer (who need not be a Member of the Board), both of whom serve at the pleasure of the Members. The current Members of the Board and the expiration dates of their terms are as follows:

**Members of the Board**

**Expiration of Term (June 30)**

Stephanie Pollack Secretary of Transportation and Chief Executive Officer of the Massachusetts Department of Transportation (“ <i>MassDOT</i> ”), Commonwealth of Massachusetts	*
Michael P. Angelini, Chairman Chairman, Bowditch & Dewey	2017 <sup>†</sup>
L. Duane Jackson, Vice Chairman Managing Partner, Alinea Capital Partners, LLC	2018
Lewis Evangelidis Worcester County Sheriff	2020
Patricia A. Jacobs President, AT&T New England	2023
John A. Nucci Senior Vice President for External Affairs, Suffolk University	2022
Sean M. O’Brien President, Teamsters Local 25	2019

\* The Secretary of Transportation is an *ex officio* Member of the Board.

<sup>†</sup> Will continue to serve until a successor is appointed and qualified.

The management of the Authority and its operations is carried out by a staff headed by the Chief Executive Officer and Executive Director, who is appointed by and reports directly to the Board.

The Authority has two operating Departments – Aviation and Maritime – each of which is charged with profit and loss responsibility. The staff members overseeing the operation of the Authority’s facilities are charged with balancing financial performance with operational demands, customer service and community impacts, as well as forecasting the implications of any proposed capital programs or operating initiatives, and for the collection of accounts receivable.

The senior staff of the Authority currently includes the following persons, who are each aided by administrative, operating and maintenance personnel:

Thomas P. Glynn, Chief Executive Officer and Executive Director, joined the Authority in November 2012. In June 2017, the Board voted to extend Mr. Glynn’s contract for two years, through October 2019. Prior to coming to the Authority, he served for 14 years as Chief Operating Officer of Partners HealthCare, a network of teaching hospitals and neighborhood health centers, including Massachusetts General Hospital and Brigham and Women’s Hospital (both affiliated with Harvard Medical School), with over \$8.0 billion in annual operating revenues. Before that he served as Deputy Secretary of Labor during the Clinton Administration (from 1993 to 1996) and General Manager of the Massachusetts Bay Transportation Authority (“*MBTA*”) from 1989 to 1991. Mr. Glynn earned a B.A. in Economics from Tufts University and a Ph.D. from the Heller School at Brandeis University. He has served as a trustee at Brandeis University and a director at the John Hancock Company.

John P. Prankevicius, Director of Administration & Finance and Secretary-Treasurer, joined the Authority in May 2007. He oversees the Authority’s financial responsibilities including treasury, budgeting, accounting, debt and investment management and administration, and serves as Treasurer-Custodian of the Massachusetts Port Authority Employees’ Retirement System and Chair of the Authority’s Retiree Benefits Trust. Prior to joining the Authority, he served as the Chief Financial Officer for the City of Worcester, Massachusetts. Mr. Prankevicius is licensed in the Commonwealth as a Certified Public Accountant, and holds a B.A. degree and a Masters in Public Administration from the University of Maine and an M.S. in Accountancy from Bentley University.



Francis X. Anglin, Chief Information Officer, joined the Authority in September 1984 and was appointed to his current position in October 1994. He oversees the Authority's Information and Telecommunications systems for employees and members of the public who use the Authority's facilities and systems. Prior to joining the Authority, Mr. Anglin's private sector work included: food manufacturing—wholesale and retail; and education—computer design and curriculum. He holds a B.S. in Transportation Logistics from Northeastern University and an M.B.A. from Babson College.

Elizabeth Dello Russo Becker, Director of Community Relations & Government Affairs joined the Authority's Legal Department in September 2014, and was appointed to her current position in March 2017 after serving as Acting Director of Community Relations and Government Affairs since September 2016. She is responsible for directing the development and implementation of community and government relations and charitable giving initiatives designed to lessen the impact the Authority's facilities have on its neighbors. Prior to joining the Authority, Ms. Becker was the Director of the Office of Gaming Accountability for the City of Boston under former Mayor Thomas M. Menino and Mayor Martin J. Walsh. Ms. Becker has a J.D. from Suffolk University Law School and is a graduate of Mount Holyoke College.

Matthew Brelis, Director of Public Affairs, joined the Authority in 2007. He works closely with Strategic Communications, Media Relations and Community Relations to proactively shape the public perception of the Authority. Prior to coming to the Authority, Mr. Brelis spent 27 years at major metropolitan newspapers, and his work was honored with a Pulitzer Prize. He received a bachelor's degree from Vassar College and is a Nieman Fellow at Harvard University.

James P. Doolin, Chief Development Officer, joined the Authority in 1995 as Deputy Director for Planning and Development. Mr. Doolin was appointed Chief Development Officer in March 2013, and also served as Acting Chief Development Officer from March 2012 to March 2013. Prior to joining the Authority, Mr. Doolin was a Senior Associate at Sasaki Associates, a multidisciplinary consulting firm with services in planning, urban design, architecture and landscape architecture. Mr. Doolin has a B.S. from the University of Connecticut and a Masters in Regional Planning from the University of Pennsylvania.

Edward C. Freni, Director of Aviation, joined the Aviation Division of the Authority in 2000 as the Deputy Director of Aviation Operations at Logan Airport, Hanscom Field and Worcester Regional Airport and was appointed to his current position in 2007. He is responsible for administering, coordinating and managing all airside and landside activities and operations at all three airports. Prior to joining the Authority, Mr. Freni worked for 23 years at American Airlines. He holds a B.S. degree from the University of New Hampshire.

David M. Gambone, Chief Human Resources Officer, joined the Authority in March 2004. He oversees all core functions of Human Resources, including recruitment, compensation, benefits, training and development, performance management, employee relations, health and wellness, leave management and human resources management systems. Mr. Gambone has over 25 years of human resources management experience having worked in the private sector as the head of human resources for consulting firms and training organizations focused on executive leadership development. He holds a B.A. in Philosophy from Boston College. He is also certified as a Senior Professional in Human Resources (SPHR).

Joris M. Jabouin, Director of Internal Audit, joined the Authority in October 2012. He assists the Members of the Authority with their oversight responsibilities through audits, investigations and evaluations of the Authority's activities. Mr. Jabouin has over 20 years of auditing experience as a regulator, external auditor and internal auditor reviewing the business and operations of governmental entities, publicly-traded companies, private organizations and trusts. Prior to joining the Authority, he served as the chief auditor for Burger King Corporation, BankUnited and Dresdner Bank in Miami, Florida. Mr. Jabouin is a Certified Public Accountant and holds Master of Business Administration and Bachelor of Business Administration degrees from the University of Miami.

Danny T. Levy, Director of Strategic Communications & Marketing, joined the Authority in 2004. She oversees the Authority's external and internal communications and marketing strategies, branding, promotional campaigns and event planning both for the Authority and its facilities. Ms. Levy was appointed to her current position in 2007 after three years as the Authority's Director of Communications overseeing media relations, during which time she implemented the business practices and corporate communications experience she gained in

financial services (Bank of America formerly FleetBoston Financial Corporation) and certain of Boston's leading non-profits—the United Way of Mass Bay and the Boys & Girls Clubs of Boston. She has a B.A. from Boston College and an M.B.A. from Simmons School of Management.

José C. Massó, III, Director of Policy, joined the Authority in March 2013 and works closely with the Chief Executive Officer on establishing policies and procedures for innovative transportation-related technology devices. Mr. Massó has a long and distinguished career in government, community affairs, communications and consulting. He began his public service career in 1983 in the Governor's Office of Community Services and has held key posts at the MBTA, Northeastern University and the Puerto Rico Federal Affairs Administration. He is fluent in Spanish and skilled in cross-cultural communications, with a B.A. degree from Antioch College.

Joseph F. McCann, Comptroller, joined the Authority in 2010 and is responsible for coordinating all accounting activities throughout the Authority and administering the Authority's internal controls and financial reporting efforts. Prior to joining the Authority, Mr. McCann was the Chief Financial Officer for the Massachusetts Turnpike Authority. Mr. McCann is licensed in the Commonwealth as a Certified Public Accountant, and holds a B.S. degree from Northeastern University.

Catherine M. McDonald, Chief Legal Counsel, joined the Authority in 1999 and was appointed to her current position in January 2016, having served as Acting Chief Legal Counsel since July 2015. She oversees legal activity in all functional areas including real estate, construction, litigation, employment and ethics, maritime, aviation, security and public finance. Prior to joining the Authority, Ms. McDonald was an Assistant Chief of Staff in the Governor's Office, an Associate at McDermott, Will and Emery and a law clerk to the Honorable A. David Mazzone of the United States District Court for Massachusetts. Ms. McDonald holds degrees from Northeastern University and Suffolk University School of Law.

Jennifer B. Mehigan, Acting Director of Media Relations, joined the Authority in June 2014 as the Assistant Director of Media Relations. Prior to joining the Authority, Ms. Mehigan was the Director of Media Relations for Boston EMS, and Deputy Press Secretary under former Mayor Thomas Menino. Ms. Mehigan has a master's degree in Journalism from American University in Washington, D.C. and a bachelor's degree from Wheaton College, Norton, Massachusetts.

Elizabeth S. Morse, Chief of Staff, joined the Authority in August 2015. Before joining the Authority, Ms. Morse worked for 12 years in healthcare, most recently as a Senior Director for Health System Strategies at CVS Health. She also held various positions in state government with the Executive Office of Health & Human Services, the Executive Office of Communities and Development and the Office of the Governor. Ms. Morse received a B.A. in government from Colby College.

George Naccara, Chief Security Officer, joined the Authority in January 2014. He oversees the implementation, management and administration of all security and emergency management activities for all Authority physical assets. Previously, he served as the Federal Security Director at Logan Airport, working for the Transportation Security Administration ("TSA") under the U.S. Department of Homeland Security. He had responsibility for all airports in Massachusetts and for security associated with mass transit, commuter rail, maritime and pipeline issues in the Commonwealth. Prior to TSA, he served in the U.S. Coast Guard for over 37 years, retiring as a Rear Admiral. A Harvard University Fellow, he also holds a master's degree from Central Michigan University and a bachelor's degree from the U.S. Coast Guard Academy.

Houssam H. Sleiman, Director of Capital Programs and Environmental Affairs, joined the Authority in October 1993 and was appointed to his current position in May 2006. He directs the overall management of the Authority's capital improvement program, safety program, utilities management, in-house design and environmental permitting and management. He also served as the Authority's Director of Aviation Administration and Development. Prior to joining the Authority, he worked for the Town of Lexington, Massachusetts. He is a licensed registered Professional Engineer in the Commonwealth. He holds a M.S. degree in Civil Engineering and a B.S. degree in Civil Engineering from Northeastern University.

Kelly B. Strong, Director of Labor Relations/Labor Counsel, joined the Authority in April 2004. He is responsible for all matters related to each of the Authority's union collective bargaining agreements and all other

union related matters affecting the Authority's mission and its tenants, customers, employees and the public. Mr. Strong is responsible for negotiating and properly administrating the Authority's union collective agreements, as well as overseeing the resolution of all union labor disputes. Prior to joining the Authority, he was a Senior Labor Relations Representative for the MBTA and prior to that was a labor and employment attorney with a Boston law firm. He has a B.A. in Criminal Justice from the Military College of Vermont at Norwich University and received his J.D. from Suffolk University Law School.

Anna M. Tenaglia, Director of Treasury, joined the Authority in June 2008 and was appointed to her current position in March 2015. She is responsible for defining and implementing the Authority's financial policies including debt financing, investment of the Authority's cash and development of the strategy for the use of passenger facility charge ("*PFC*") applications, and she manages all aspects of the Treasury department. Prior to joining the Authority, Ms. Tenaglia was the Chief Financial Officer for the City of Gloucester, the Treasurer/Assistant Finance Director for the City of Chelsea and was also a former Vice President at State Street Bank's Institutional Investor Services Division. She holds a B.S. in finance from Suffolk University and an M.B.A. with a concentration in finance from Southern New Hampshire University. Her designations include Certified Treasury Professional (CTP) and Certified Energy Procurement Professional (CEP).

Kenneth L. Turner, Director of Diversity & Inclusion/Compliance, joined the Authority in June 2013. He oversees and manages the Authority's multiple diversity programs, including business and supplier diversity, workforce diversity and airport concessions, as well as all compliance initiatives associated with the Authority's Disadvantaged/Minority/Women Business Enterprise programs. Prior to joining the Authority, Mr. Turner served as Deputy Secretary for Administration & Finance for the Commonwealth of Massachusetts Department of Veterans' Services. He also has over 20 years of general management and executive experience in various Fortune 100 companies, including having served as a Senior Vice President at AOL Time Warner and as Vice President of Marketing for Simmons College. A retired U.S. Navy Captain with 26 years of service, Mr. Turner holds a B.S. degree in Liberal Arts from Southern University and A&M College.

Lisa S. Wieland, Port Director, joined the Authority in 2006 and was appointed to her current position in January 2016, having served as Acting Port Director since March 2015. In her current role, and previously as Maritime's Chief Administrative Officer, she leads all financial management, business planning, strategic initiatives, process improvement, special projects, and the day-to-day management of the Maritime division. Before joining the Maritime team, Ms. Wieland served in several roles at the Authority, including the Director of HR Strategy & Employment and the Director of Corporate Planning and Analysis. Prior to joining the Authority, Ms. Wieland worked as a Consultant for Bain & Company, serving health care and consumer products clients, and previous to that, for CNN in various news and political assignments. Ms. Wieland received a B.A. degree in Political Science from UCLA and an M.B.A. from Harvard Business School.

## **AIRPORT PROPERTIES**

### **Boston-Logan International Airport**

The Airport is the principal source of the Authority's Revenues, Operating Expenses and Net Revenues and is the dominant factor in the determination of the Authority's financial condition. In fiscal year 2016, the Airport Properties accounted for approximately 85.2% of the Authority's Revenues and approximately 92.7% of the Authority's Net Revenues (as defined in the 1978 Trust Agreement). The Airport is situated principally in East Boston (with a small portion situated in the Town of Winthrop), approximately three miles from downtown Boston and adjacent to Boston Harbor. The total land area of the Airport is approximately 2,400 acres.

**Air Service Region.** The Airport serves the greater Boston area and plays the leading role in New England's air service infrastructure. Based upon information provided by the United States Department of Transportation ("*USDOT*") for calendar year 2016, approximately 94.5% of total passengers at the Airport begin or end their air travel ("*origin-destination*" travel) at Logan Airport. See APPENDIX C – Boston Logan International Airport Market Analysis.

The high percentage of origin-destination passengers in both the business and leisure markets is in contrast to many other major airports that are used in large part by airlines as connecting hubs for passengers en route to another point as their final destination. As a result of this traffic base, overall activity levels at Logan Airport are less vulnerable to fluctuations in connecting traffic resulting from route restructuring by individual airlines or other factors affecting particular airlines. Rather, Airport activity levels tend to reflect general economic conditions, regional economic and demographic trends and the economics of the airline industry. See APPENDIX C – Boston Logan International Airport Market Analysis.

The Boston metropolitan area was the 10<sup>th</sup> largest metropolitan area in the United States in terms of population as of March 2017, and it ranked 9<sup>th</sup> in the nation with 2.7 million employees as of March 2017. It had an unemployment rate of 3.4% in March 2017, below the national average of 4.5%, and 6.4 percentage points lower than the peak of 9.8% in January 2010. The unemployment rate in the Boston metropolitan area was the 3<sup>rd</sup> lowest among the nation's large metropolitan areas (*i.e.*, those with populations of larger than one million) as of March 2017. In the greater Boston area, the following six major sectors have contributed to the Boston region's economic growth since the early 1990s and currently account for approximately one half of the Boston area employment base: high technology, biotechnology, health care, financial services, higher education and tourism. The Boston metropolitan area's average per capita personal income in calendar year 2015 was 30.4% above the national average and 4.2% above the New England average. During the period 2000 to 2015, Massachusetts per capita income grew slightly faster than in the U.S. as a whole. It is projected to grow at a rate of 1.5% annually from 2015 to 2030, as compared to the national U.S. projected growth of 1.4% annually. See APPENDIX C – Boston Logan International Airport Market Analysis.

**Airport Traffic Levels.** The following table summarizes Airport operations and passenger traffic statistics for the most recent five fiscal years and the nine-month periods ended March 31, 2016 and 2017. Both operations and passengers are grouped by origin and destination regardless of whether the carrier was a U.S. air carrier or a foreign flag carrier.

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**SELECTED BOSTON-LOGAN INTERNATIONAL AIRPORT TRAFFIC STATISTICS**  
(Fiscal Year Ended June 30, except as noted)

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>Nine Months Ending 3/31/2016</u>	<u>Nine Months Ending 3/31/2017</u>
<b>Aircraft Operations (1)</b>							
Domestic (2)	210,309	206,541	219,534	224,928	237,479	174,675	180,119
International (3)	37,956	38,400	38,059	41,084	46,687	33,148	37,656
Regional	87,895	79,634	79,983	71,233	72,416	55,167	50,934
General Aviation	29,062	26,924	26,286	26,114	30,026	21,836	23,126
<b>Total Operations</b>	<b>365,222</b>	<b>351,499</b>	<b>363,862</b>	<b>363,359</b>	<b>386,608</b>	<b>284,826</b>	<b>291,835</b>
<b>Aircraft Landed Weights (1,000 pounds) (4)</b>							
	<u>19,858,768</u>	<u>19,494,836</u>	<u>20,297,245</u>	<u>20,784,046</u>	<u>22,652,895</u>	<u>16,487,645</u>	<u>17,605,093</u>
<b>Passengers Traffic</b>							
Domestic (2)							
Enplaned	11,296,136	11,374,807	11,990,184	12,551,985	13,368,762	9,722,300	10,435,709
Deplaned	11,308,598	11,409,669	12,045,512	12,591,542	13,466,887	9,718,440	10,398,529
International (3)							
Enplaned	2,146,491	2,216,937	2,337,269	2,611,642	3,004,322	2,110,260	2,482,585
Deplaned	2,182,472	2,255,775	2,348,399	2,634,590	3,034,210	2,168,483	2,526,425
Regional							
Enplaned	1,114,704	1,029,877	1,011,299	903,180	962,163	732,660	630,799
Deplaned	1,117,810	1,024,898	1,021,968	910,348	952,308	725,349	622,650
Subtotal	<u>29,166,211</u>	<u>29,311,963</u>	<u>30,754,631</u>	<u>32,203,287</u>	<u>34,788,652</u>	<u>25,177,492</u>	<u>27,096,697</u>
General Aviation ("GA")							
Total Passengers	<u>117,798</u>	<u>96,942</u>	<u>95,632</u>	<u>95,934</u>	<u>109,766</u>	<u>80,812</u>	<u>82,064</u>
<b>Total Passengers</b>	<b>29,284,009</b>	<b>29,408,905</b>	<b>30,850,263</b>	<b>32,299,221</b>	<b>34,898,418</b>	<b>25,258,304</b>	<b>27,178,761</b>
<b>Total Enplaned Passengers (excluding GA)</b>	<b>14,557,331</b>	<b>14,621,621</b>	<b>15,338,752</b>	<b>16,066,807</b>	<b>17,335,247</b>	<b>12,565,220</b>	<b>13,549,093</b>
<b>Average Passengers Per Flight</b>							
Domestic (2)	107.5	110.3	109.5	111.8	113.0	111.3	115.7
International (3)	114.1	116.5	123.1	127.7	129.3	129.1	133.0
Regional	25.4	25.8	25.4	25.5	26.4	26.4	24.6
<b>Air Carrier and Passenger Metrics</b>							
Primary carrier	JetBlue	JetBlue	JetBlue	JetBlue	JetBlue	JetBlue	JetBlue
Primary carrier market share (5)	23.8%	26.2%	26.5%	26.9%	26.5%	26.8%	27.4%
Two top carriers market share	35.0%	37.6%	37.7%	39.2%	40.7%	47.7%	45.5%
Origination & destination share (6)	95.5%	95.0%	94.5%	94.5%	94.5%	NA	NA
Compensatory airline payments to							
Massport per enplaned passenger (7)	\$13.20	\$13.16	\$13.55	\$13.78	\$13.45	\$13.63	\$14.24
Logan Airport revenue per enplaned passenger (8)	\$32.75	\$33.00	\$34.07	\$34.76	\$33.85	\$34.29	\$35.01
<b>Total Cargo &amp; Mail (1,000 pounds)</b>	<b>546,243</b>	<b>552,378</b>	<b>572,226</b>	<b>625,749</b>	<b>606,101</b>	<b>445,632</b>	<b>497,765</b>

(1) Includes all-cargo flights.

(2) Includes domestic flights on jets and charters.

(3) Includes international flights on jet, charter and commuter carriers.

(4) Excludes general aviation and non-tenant.

(5) Data consists of mainline activity only.

(6) The source of this statistic is the Massachusetts Port Authority and U.S. DOT, Air Passenger Origin-Destination Survey, reconciled to Schedules T1 and 298C T1, as reported in Appendix CFC-1 to the Authority's CAFR; this statistic is calculated based on outbound passengers only as of fiscal year end.

(7) Consists of landing fees, terminal rents, certain non-PFC passenger fees and aircraft parking fees

(8) Consists of landing fees, terminal rents, parking, utilities, non-terminal and ground rent, concessions and baggage fees.

Source: Authority reports.

Passenger traffic at the Airport totaled 34.9 million passengers for fiscal year 2016 (including general aviation), an 8.0% increase from the 32.3 million passengers who used the Airport in the prior year. Passenger traffic increased 4.7% in fiscal year 2015 and 4.9% in fiscal year 2014. For the nine-month period ending March 31, 2017 passenger traffic was 7.6% greater than the nine-month period ending March 31, 2016. Landed weights for fiscal year 2016 were 9.0% higher than fiscal year 2015, and in the nine-month period ending March 31, 2017, were 6.8% greater than for the same nine-month period ending in 2016. See “AUTHORITY REVENUES – Airport Properties Revenues” and “MANAGEMENT’S DISCUSSION OF HISTORICAL OPERATING RESULTS.”

On a calendar year basis, passenger traffic at the Airport totaled approximately 36.3 million passengers in 2016 (including general aviation). This represented a 8.5% increase in passenger traffic over calendar year 2015, following calendar year passenger traffic increases of 5.7% and 4.7% in calendar years 2015 and 2014, respectively.

According to preliminary data from the Airports Council International (“ACI”), Logan Airport was the most active airport in New England and the 17<sup>th</sup> most active airport in North America in reporting year 2016 (the most recent data available), based upon total passenger volume. In reporting year 2015 (the most recent year for which data is available), Logan Airport was the 51<sup>st</sup> most active in the world according to data from the ACI.

The following tables summarize regional, international and domestic passenger traffic statistics (including general aviation) for Logan Airport for most recent three years on both a fiscal year basis and a calendar year basis.

### Passengers by Traffic Type

Fiscal Year					Calendar Year				
Period	Regional	International	Domestic	Total	Period	Regional	International	Domestic	Total
FY2014	2,033,267	4,685,668	24,131,328	30,850,263	CY2014	2,035,735	4,992,225	24,606,485	31,634,445
FY2015	1,813,528	5,246,232	25,239,461	32,299,221	CY2015	1,835,803	5,534,176	26,079,601	33,449,580
FY2016	1,914,471	6,038,532	26,945,415	34,898,418	CY2016	1,724,617	6,587,473	27,975,952	36,288,042

### Market Share by Traffic Type

Fiscal Year				Calendar Year			
Period	Regional	International	Domestic	Period	Regional	International	Domestic
FY2014	6.6%	15.2%	78.2%	CY2014	6.4%	15.8%	77.8%
FY2015	5.6	16.2	78.1	CY2015	5.5	16.5	78.0
FY2016	5.5	17.3	77.2	CY2016	4.8	18.2	77.1

### Year over Year Variances by Traffic Type

Fiscal Year					Calendar Year				
Period	Regional	International	Domestic	Total	Period	Regional	International	Domestic	Total
FY2014	(1.0%)	4.8%	5.5%	4.9%	CY2014	1.1%	9.8%	4.0%	4.7%
FY2015	(10.8)	12.0	4.6	4.7	CY2015	(9.8)	10.9	6.0	5.7
FY2016	5.6	15.1	6.8	8.0	CY2016	(6.1)	19.0	7.3	8.5

Source: Authority.

Domestic jet passengers (including charters) accounted for 77.1% of passenger traffic in calendar year 2016 and 78.0% of passenger traffic in calendar year 2015. The Airport’s domestic jet passenger traffic reached 28.0 million in calendar year 2016, surpassing the Airport’s previous record for domestic jet passengers of 26.1 million in calendar year 2015. This represents a 7.3% increase for calendar year 2016 as compared to the previous increase for calendar year 2015 of 6.0%.

In calendar years 2016 and 2015, passengers traveling domestically on regional airlines accounted for approximately 4.8% and 5.5% of total passenger traffic at the Airport, respectively, or approximately 1.7 and 1.8

million passengers each calendar year, respectively. The number of regional passengers (excluding passengers traveling internationally) decreased by 6.1% in calendar year 2016, decreased by 9.8% in calendar year 2015 and increased by 1.1% in calendar year 2014.

International passengers, including those traveling on foreign flag and U.S. flag carriers (including U.S. regional carriers) accounted for 18.2% of passenger traffic in calendar year 2016, or approximately 6.6 million passengers. This segment increased by 19.0% in calendar year 2016, following increases of 10.9% and 9.8% in calendar years 2015 and 2014, respectively. Of the 18.2% of passengers traveling internationally in calendar year 2016, 52.2% traveled to or from Europe, 15.7% to or from Bermuda and the Caribbean, 13.3% to or from Canada, 10.0% to or from Middle East, 6.3% to or from the Trans-Pacific and 2.5% to or from Central and South America.

In calendar year 2016, there were approximately 391,222 airline operations (including both commercial and general aviation) at the Airport, an increase of 4.9% from calendar year 2015. While airline operations at the Airport decreased more than 2.1% between calendar year 2007 and 2016, the Airport's total passengers (including both commercial and general aviation) increased by 25.0% over the same period. This was due, in part, to the airlines' use of larger-sized aircraft and their achievement of higher capacity utilization during this period.

The following table shows monthly growth in enplaned passengers (including general aviation) for the 12 months ended March 31, 2016 and 2017. As shown on the table below, for the 12 months ending March 31, 2017, the number of enplaned passengers at the Airport was 7.7% higher than for the same period in 2016.

**BOSTON-LOGAN INTERNATIONAL AIRPORT  
MONTHLY GROWTH IN ENPLANED PASSENGER (Year over Year)  
12 Months ended 3/31/2016 and 3/31/2017**

	12 Mos. Ended <u>3/31/2016</u>	12 Mos. Ended <u>3/31/2017</u>	<u>Growth %</u>
April	1,423,654	1,490,345	4.7%
May	1,484,952	1,603,195	8.0
June	1,542,523	1,690,964	9.6
July	1,658,761	1,764,236	6.4
August	1,657,722	1,769,202	6.7
September	1,398,153	1,527,557	9.3
October	1,533,495	1,616,212	5.4
November	1,325,158	1,464,794	10.5
December	1,325,958	1,450,361	9.4
January	1,141,223	1,274,961	11.7
February*	1,158,100	1,212,045	4.7
March	1,407,056	1,510,757	7.4
<b>Total 12 months</b>	<b>17,056,755</b>	<b>18,374,629</b>	<b>7.7%</b>

Source: Authority.

\* Lower year-over-year growth in February was primarily due to February 2016 leap day.

**Airline Passenger Services.** As primarily an origin-destination airport, Logan Airport is served today, as it has been in the past, by a wide variety of carriers. As of July 1, 2017, airline service at the Airport, both scheduled and non-scheduled, will be provided by 48 airlines, as listed in the table below, including nine domestic large jet carriers, 30 non-U.S. flag (“foreign flag”) carriers and nine domestic regional and commuter airlines (“regional airlines” or “regional carriers”).

**BOSTON-LOGAN INTERNATIONAL AIRPORT  
AIRLINES SERVING THE AIRPORT\*  
(Scheduled as of July 1, 2017)**

**U.S. Domestic Large Jet Carriers**

Alaska <sup>2</sup>  
American  
Delta  
JetBlue  
Southwest  
Spirit  
Sun Country  
United  
Virgin America <sup>2</sup>

**U.S. Domestic Regional Carriers<sup>1</sup>**

<i>Independent:</i> Cape Air PenAir	<i>Affiliated:</i> Air Wisconsin (American Eagle) Endeavor Air (Delta Connection) ExpressJet (Delta Connection and United Express) GoJet (Delta Connection) Piedmont (American Eagle) Republic Airlines (American Eagle and United Express) <sup>3</sup> SkyWest (Delta Connection and United Express)
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**Foreign Flag Carriers**

Aer Lingus Aeroméxico Air Berlin Air Canada <sup>4</sup> Air Europa Air France Alitalia Avianca British Airways Cathay Pacific	Copa Airlines El Al Emirates Hainan Airlines Iberia Icelandair Japan Airlines Lufthansa Norwegian Air Shuttle Porter Airlines	Qatar SATA Scandinavian Swiss International TAP Portugal Thomas Cook Turkish Airlines Virgin Atlantic Airways WestJet Wow Air
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\* In calendar year 2016 Logan Airport was also served by 22 different charter-only airlines.

<sup>1</sup> The independent U.S. domestic regional carriers operate their own routes. The affiliated U.S. domestic regional carriers serving Logan are either wholly owned by a network carrier or operate under joint marketing agreements with network carriers. Three affiliated U.S. domestic regional carriers—ExpressJet, Republic and SkyWest—operate at the Airport for more than one network carrier.

<sup>2</sup> In December 2016, Alaska Airlines acquired Virgin America; a single operating certificate for the combined entity is expected to be issued in 2018.

<sup>3</sup> Effective February 1, 2017, Shuttle America merged into Republic Airlines.

<sup>4</sup> Includes regional carriers Jazz Air and Sky Regional Airlines, both of which operate as part of Air Canada Express.

The Authority maintains separate statistical data for regional airlines. For purposes of the Authority’s data compilation, regional airlines are defined as domestic commuter carriers that exclusively operate smaller regional jet and turbo-prop aircraft with fewer than 100 seats. Most of these carriers are generally subsidiaries or affiliates of major domestic carriers, as noted above, with the exception of Cape Air and PenAir, which operate their own routes. As of June 30, 2016, the top five regional airlines were Endeavor Air with 26.2% of domestic regional passengers, followed by Shuttle America Corporation with 20.1% (which merged with Republic Airlines effective February 1, 2017), Express Jet with 10.8%, Republic Airlines with 10.7%, and Cape Air with 10.0% of domestic regional passengers.

In response to competitive pressures, the U.S. airline industry has consolidated over the past decade. In October 2008, Delta Air Lines (“*Delta*”) and Northwest Airlines merged and consolidated under the Delta name. In November 2010, United Airlines (“*United*”) and Continental Airlines completed a merger transaction and in March 2012 consolidated all activity under the United name. In May 2011, Southwest Airlines (“*Southwest*”) and AirTran Airways completed a merger transaction and as of the end of calendar year 2014 consolidated all operations under the Southwest name. In December 2013, American Airlines (“*American*”) and US Airways merged and as of October 1, 2015 all operations were integrated under the American name, creating the world’s largest airline. As a result of the above-described mergers, the four largest U.S. air carrier airlines now consist of American, Delta, Southwest and United. Most recently, in December 2016, Alaska Airlines acquired Virgin America, making Alaska Airlines the fifth largest domestic carrier in terms of seat capacity. A single operating certificate for the combined entity, which will operate under the Alaska Airlines name, is expected to be issued in 2018.



The following table shows passenger traffic for the carriers providing service from Logan Airport for the past five fiscal years and for the nine months ended March 31, 2017. For the nine months ended March 31, 2017, the Airport experienced an aggregate 7.6% increase in passenger traffic, compared to the nine months ended March 31, 2016.

**BOSTON-LOGAN INTERNATIONAL AIRPORT**  
**ANNUAL PASSENGERS BY CARRIER**  
(Fiscal Year Ended June 30, except as noted)

<u>Air Carrier</u> <sup>(1)</sup>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	Nine Months Ended 3/31/16	Nine Months Ended 3/31/17	Growth %
American <sup>(2)</sup>	<b>7,117,928</b>	<b>6,868,539</b>	<b>6,941,775</b>	<b>7,054,759</b>	<b>7,130,681</b>	<b>5,264,924</b>	<b>4,912,154</b>	<b>(6.7)%</b>
<i>American</i>	3,262,121	3,173,727	3,082,718	3,030,967	5,079,473	3,213,716	4,912,154	*
<i>US Airways</i>	3,855,807	3,694,812	3,859,057	4,023,792	2,051,208	2,051,208	-	*
Delta <sup>(3)</sup>	<b>4,372,566</b>	<b>4,215,879</b>	<b>4,374,313</b>	<b>4,756,868</b>	<b>5,102,225</b>	<b>3,700,713</b>	<b>3,945,445</b>	<b>6.6</b>
JetBlue	<b>6,970,516</b>	<b>7,719,513</b>	<b>8,181,523</b>	<b>8,680,357</b>	<b>9,253,087</b>	<b>6,737,279</b>	<b>7,412,647</b>	<b>10.0</b>
Southwest <sup>(4)</sup>	<b>2,749,065</b>	<b>2,384,502</b>	<b>2,540,146</b>	<b>2,455,713</b>	<b>2,827,355</b>	<b>2,018,157</b>	<b>2,223,889</b>	<b>10.2</b>
<i>AirTran Airways</i>	1,137,054	863,013	599,766	100,691	-	-	-	*
<i>Southwest</i>	1,612,011	1,521,489	1,940,380	2,355,022	-	-	-	*
United <sup>(5)</sup>	<b>3,636,617</b>	<b>3,611,244</b>	<b>3,749,091</b>	<b>3,614,914</b>	<b>3,822,367</b>	<b>2,794,170</b>	<b>2,894,529</b>	<b>3.6</b>
<i>Continental Airlines</i>	834,484	-	-	-	-	-	-	*
<i>United</i>	2,802,133	-	-	-	-	-	-	*
Foreign Flag	<b>2,822,066</b>	<b>3,034,958</b>	<b>3,359,482</b>	<b>3,878,971</b>	<b>4,539,853</b>	<b>3,193,789</b>	<b>3,905,582</b>	<b>22.3</b>
Regional U.S. Carriers <sup>(6)</sup>	<b>208,271</b>	<b>248,051</b>	<b>265,274</b>	<b>239,607</b>	<b>241,021</b>	<b>185,319</b>	<b>178,697</b>	<b>(3.6)</b>
Other U.S. Carriers <sup>(7)</sup>	<b><u>1,289,182</u></b>	<b><u>1,229,277</u></b>	<b><u>1,343,027</u></b>	<b><u>1,522,098</u></b>	<b><u>1,872,063</u></b>	<b><u>1,283,141</u></b>	<b><u>1,623,754</u></b>	<b>26.5</b>
<b>Total<sup>(8)</sup></b>	<b>29,166,211</b>	<b>29,311,963</b>	<b>30,754,631</b>	<b>32,203,287</b>	<b>34,788,652</b>	<b>25,177,492</b>	<b>27,096,697</b>	<b>7.6%</b>

- (1) For purposes of comparison, data for consolidated air carriers (American, Southwest and United) is presented for all fiscal years. In the case of each such consolidated air carrier, the data provided for each period occurring prior to the consolidation is estimated based on a summation of the individual carrier information for such period. The data provided for period(s) occurring after the consolidation reflects actual data for such period(s). To the extent individual merged carriers continue to operate separately, individual carrier information is also shown for the periods occurring post-merger, which information may not add to the consolidated figure.
- (2) Includes American Eagle (through November 2011), US Airways Shuttle (American Eagle as of October 2015) and associated regional carriers. In December 2013, American merged with US Airways, and effective October 1, 2015, the two airlines are fully integrated under the American name.
- (3) Includes Delta Shuttle and associated regional carriers.
- (4) In May 2011, Southwest merged with AirTran Airways, and effective January 1, 2015, the two airlines were fully integrated under the Southwest name.
- (5) Includes United Express, Continental Express and associated regional carriers. In March 2012, Continental merged into United and discontinued service as an independent entity.
- (6) Includes PenAir and Cape Air.
- (7) Includes Alaska Airlines, Spirit Airlines, Sun Country, Virgin America and charter/non-scheduled domestic service.
- (8) Excludes general aviation figures.
- \* Not meaningful.
- Source: Authority.

The relative share of various carriers at the Airport has fluctuated with no individual carrier having a market share of over 26.9% in any of the past ten fiscal years (excluding regional partners). The following table presents the relative shares of the U.S. air carrier airlines carrying the highest shares of total passenger traffic at the Airport, as well as the relative shares of the independent regional airlines and foreign flag carriers, during the last five fiscal years and the nine-month periods ended March 31, 2016 and 2017. Since commencing service at Logan in 2004, JetBlue Airways (“*JetBlue*”) has made Logan Airport its second largest focus city after New York-JFK. As a result, as reflected in the table below, in fiscal year 2016, JetBlue had the largest market share with 26.6% of all passengers, and for the nine months ended March 31, 2017, JetBlue also had the largest share with 27.4%. The

carriers with the highest market shares—American, Delta Air Lines, JetBlue, Southwest and United Airlines—carried an aggregate of 78.9% of all passengers traveling through the Airport during the nine months ended March 31, 2017. For additional information regarding airline market shares at Logan (reported on a calendar year basis), see Section 4.3 of APPENDIX C – Boston Logan International Airport Market Analysis.

**BOSTON-LOGAN INTERNATIONAL AIRPORT  
MARKET SHARES OF TOTAL PASSENGER TRAFFIC**  
(Fiscal Year Ended June 30, except as noted)

<u>Air Carrier<sup>(1)</sup></u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>Nine Months Ended 3/31/16</u>	<u>Nine Months Ended 3/31/17</u>
American <sup>(2)</sup>	<b>24.5%</b>	<b>23.6%</b>	<b>22.5%</b>	<b>21.9%</b>	<b>20.5%</b>	<b>20.9%</b>	<b>18.1%</b>
<i>American</i>	11.2	10.9	10.0	9.4	14.6	12.8	18.1
<i>US Airways</i>	13.3	12.7	12.5	12.5	5.9	8.1	--
Delta <sup>(3)</sup>	<b>14.9</b>	<b>14.3</b>	<b>14.2</b>	<b>14.7</b>	<b>14.7</b>	<b>14.7</b>	<b>14.6</b>
JetBlue	<b>23.9</b>	<b>26.3</b>	<b>26.5</b>	<b>26.9</b>	<b>26.6</b>	<b>26.8</b>	<b>27.4</b>
Southwest <sup>(4)</sup>	<b>9.4</b>	<b>8.1</b>	<b>8.2</b>	<b>7.6</b>	<b>8.1</b>	<b>8.0</b>	<b>8.2</b>
<i>AirTran Airways</i>	3.9	2.9	1.9	0.3	--	--	--
<i>Southwest</i>	5.5	5.2	6.3	7.3	--	--	--
United <sup>(5)</sup>	<b>12.5</b>	<b>12.3</b>	<b>12.2</b>	<b>11.2</b>	<b>11.0</b>	<b>11.1</b>	<b>10.7</b>
<i>Continental Airlines</i>	2.8	--	--	--	--	--	--
<i>United</i>	9.7	--	--	--	--	--	--
Foreign Flag	<b>9.6</b>	<b>10.3</b>	<b>10.9</b>	<b>12.0</b>	<b>13.0</b>	<b>12.7</b>	<b>14.4</b>
Regional U.S. Carriers <sup>(6)</sup>	<b>0.7</b>	<b>0.7</b>	<b>0.9</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>	<b>0.7</b>
Other U.S. Carriers <sup>(7)</sup>	<b>4.4</b>	<b>4.3</b>	<b>4.7</b>	<b>4.7</b>	<b>5.4</b>	<b>5.1</b>	<b>6.0</b>
Total <sup>(8)</sup>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

- (1) For purposes of comparison, data for consolidated air carriers (American, Southwest and United) is presented for all fiscal years. In the case of each such consolidated air carrier, the data provided for each period occurring prior to the consolidation is estimated based on summation of the individual carrier information for such period. The data provided for period(s) occurring after the consolidation reflects actual data for such period(s). To the extent individual merged carriers continue to operate separately, individual carrier information is also shown for the periods occurring post-merger, which information may not add to the consolidated figures.
- (2) Includes American Eagle (through November 2011), US Airways Shuttle (American Eagle as of October 2015) and associated regional carriers. In December 2013, American merged with US Airways, and effective October 1, 2015, the two airlines are fully integrated under the American name.
- (3) Includes Delta Shuttle and associated regional carriers.
- (4) In May 2011, Southwest merged with AirTran Airways, and effective January 1, 2015, the two airlines were fully integrated under the Southwest name.
- (5) Includes United Express, Continental Express and associated regional carriers. In March 2012, Continental merged into United and discontinued service as an independent entity.
- (6) Includes PenAir and Cape Air.
- (7) Includes Alaska Airlines, Spirit Airlines, Sun Country, Virgin America and charter/non-scheduled domestic service.
- (8) Excludes general aviation figures.

Source: Authority.

The following table shows changes in passenger traffic for the largest carriers serving Logan Airport for the past five fiscal years and for the nine months ended March 31, 2016 and March 31, 2017.

**BOSTON-LOGAN INTERNATIONAL AIRPORT  
ANNUAL CHANGE IN PASSENGERS BY CARRIER**  
(Fiscal Year Ended June 30, except as noted)

<u>Air Carrier</u> <sup>(1)</sup>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	Nine Months Ended <u>3/31/16</u>	Nine Months Ended <u>3/31/17</u>	CAGR* <u>2012-16</u>
American <sup>(2)</sup>	<b>(2.8)%</b>	<b>(3.5)%</b>	<b>1.1%</b>	<b>1.6%</b>	<b>1.1%</b>	<b>2.2%</b>	<b>(6.7%)</b>	<b>0.0%</b>
<i>American</i>	(7.6)	(2.7)	(2.9)	(1.7)	--	--	--	--
<i>US Airways</i>	1.7	(4.2)	4.4	4.3	--	--	--	--
Delta <sup>(3)</sup>	<b>1.3</b>	<b>(3.6)</b>	<b>3.8</b>	<b>8.7</b>	<b>7.3</b>	<b>8.8</b>	<b>6.6</b>	<b>3.9</b>
JetBlue	<b>15.9</b>	<b>10.7</b>	<b>6.0</b>	<b>6.1</b>	<b>6.6</b>	<b>6.3</b>	<b>10.0</b>	<b>7.3</b>
Southwest <sup>(4)</sup>	<b>(4.8)</b>	<b>(13.3)</b>	<b>6.5</b>	<b>(3.3)</b>	<b>15.1</b>	<b>12.9</b>	<b>10.2</b>	<b>0.7</b>
<i>AirTran Airways</i>	(8.7)	(24.1)	(30.5)	(83.2)	--	--	--	--
<i>Southwest</i>	(1.9)	(5.6)	27.5	21.4	--	--	--	--
United <sup>(5)</sup>	<b>1.7</b>	<b>(0.7)</b>	<b>3.8</b>	<b>(3.6)</b>	<b>5.7</b>	<b>7.5</b>	<b>3.6</b>	<b>1.3</b>
<i>Continental Airlines</i>	(30.4)	--	--	--	--	--	--	--
<i>United</i>	18.0	--	--	--	--	--	--	--
Foreign Flag	<b>5.2</b>	<b>7.5</b>	<b>10.7</b>	<b>15.5</b>	<b>17.0</b>	<b>15.5</b>	<b>22.3</b>	<b>12.6</b>
Regional U.S. Carriers <sup>(6)</sup>	<b>14.5</b>	<b>19.1</b>	<b>6.9</b>	<b>(9.7)</b>	<b>0.6</b>	<b>1.3</b>	<b>(3.6)</b>	<b>3.7</b>
Other U.S. Carriers <sup>(7)</sup>	<b>(2.8)</b>	<b>(5.7)</b>	<b>8.5</b>	<b>12.5</b>	<b>23.0</b>	<b>22.4</b>	<b>26.5</b>	<b>9.8</b>
Total <sup>(8)</sup>	<b>3.0%</b>	<b>0.4%</b>	<b>4.9%</b>	<b>4.7%</b>	<b>8.0%</b>	<b>8.2%</b>	<b>7.6%</b>	<b>4.5%</b>

(1) For purposes of comparison, data for consolidated air carriers (American, Southwest and United) is presented for all fiscal years. In the case of each such consolidated air carrier, the data provided for each period occurring prior to the consolidation is estimated based on a summation of the individual carrier information for such period. The data provided for period(s) occurring after the consolidation reflects actual data for such period(s). To the extent individual merged carriers continue to operate separately, individual carrier information is also shown for the periods occurring post-merger, which information may not add to the consolidated figure.

(2) Includes American Eagle (through November 2011), US Airways Shuttle (American Eagle as of October 2015) and associated regional carriers. In December 2013, American merged with US Airways, and effective October 1, 2015, the two airlines are fully integrated under the American name.

(3) Includes Delta Shuttle and associated regional carriers.

(4) In May 2011, Southwest merged with AirTran Airways, and effective January 1, 2015, the two airlines were fully integrated under the Southwest name.

(5) Includes United Express, Continental Express and associated regional carriers. In March 2012, Continental merged into United and discontinued service as an independent entity.

(6) Includes PenAir and Cape Air.

(7) Includes Alaska Airlines, Spirit Airlines, Sun Country, Virgin America and charter/non-scheduled domestic service.

(8) Excludes general aviation figures.

\* CAGR stands for Compound Annual Growth Rate.

Source: Authority.

**International Passenger Services.** International passenger traffic grew by 15.1%, 12.0% and 4.8% in fiscal years 2016, 2015 and 2014, respectively, increasing by 39.5% from fiscal year 2012 to fiscal year 2016. The market share of foreign flag carriers serving the Airport has increased over the five years ending in fiscal year 2016, from 9.6% of passenger traffic in fiscal year 2012 to 13.0% in fiscal year 2016. The foreign flag carriers with the largest market shares in fiscal year 2016 were British Airways, Air Canada, Aer Lingus, Lufthansa German Airlines and Emirates, with 12.8%, 11.6%, 9.7%, 9.6% and 6.7% of international passenger traffic, respectively. For fiscal year 2016, the shares of international passengers at the Airport were 52.9% for Europe, 12.4% for Canada, 16.7% for Bermuda and the Caribbean, 9.1% for the Middle East and 6.3% for Trans-Pacific.

The following table shows passenger traffic for the carriers providing international service from Logan Airport for the past five fiscal years and for the nine months ended March 31, 2016 and March 31, 2017. For the nine months ended March 31, 2017, the Airport experienced an aggregate 17.6% increase in international passenger traffic.

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**BOSTON-LOGAN INTERNATIONAL AIRPORT**  
**ANNUAL ENPLANEMENTS BY INTERNATIONAL CARRIER**  
(Fiscal Year Ended June 30, except as noted)

<u>Air Carrier</u> <sup>(1)</sup>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>Nine Months Ended 3/31/16</u>	<u>Nine Months Ended 3/31/17</u>	<u>Growth %</u>
Aer Lingus	134,035	155,727	187,543	202,529	219,334	157,979	160,494	1.6%
Aeromexico	-	-	-	2,318	26,717	19,958	24,109	20.8
Air Berlin	-	-	-	-	5,256	-	13,913	*
Air Canada <sup>(2)</sup>	205,603	223,907	236,325	249,372	261,528	185,663	217,566	17.2
Air France	135,663	133,369	121,647	115,588	113,351	85,991	78,193	(9.1)
Alitalia	59,939	57,475	53,560	56,474	57,249	39,457	36,648	(7.1)
American Airlines	135,759	84,373	18,409	11,433	27,031	17,408	16,246	(6.7)
British Airways	247,310	264,342	307,669	304,353	286,570	210,976	207,351	(1.7)
Cathay Pacific	-	-	-	8,910	49,808	35,998	40,219	11.7
COPA Airlines	-	-	33,201	33,888	35,344	27,283	31,205	14.4
Delta Air Lines	257,595	244,191	259,683	256,581	273,143	191,686	191,651	(0.0)
El AL	-	-	-	363	25,539	19,338	19,100	(1.2)
Emirates	-	-	26,056	98,538	149,645	106,603	129,440	21.4
Hainan	-	-	1,401	49,903	80,791	57,814	82,023	41.9
IBERIA	47,180	46,168	31,521	33,193	37,245	22,859	27,670	21.0
Icelandair	73,012	78,691	91,109	104,089	108,816	75,846	83,654	10.3
Japan Airlines	9,537	50,876	58,028	59,052	59,191	44,235	45,520	2.9
JetBlue	338,468	369,288	371,912	398,551	444,256	328,947	343,902	4.5
Lufthansa German Airlines	214,692	212,508	221,380	218,181	214,114	153,668	154,479	0.5
Norwegian Air	-	-	-	-	31,993	9,060	68,381	*
Porter Airlines Inc.	66,627	71,275	81,277	88,691	95,658	68,041	74,144	9.0
Qatar Airway	-	-	-	-	19,377	2,126	52,987	*
SATA Internacional	36,431	40,486	45,114	51,202	61,601	42,481	42,616	0.3
Scandinavian	-	-	-	-	5,221	98	14,231	*
Swiss International	68,214	73,030	73,029	70,677	76,827	50,322	66,122	31.4
Thomas Cook	-	-	-	-	2,343	-	5,288	*
Transportes Aereos Portugeses S.A.	-	-	-	-	4,957	-	53,019	*
Turkish	-	-	10,760	78,945	75,592	56,085	39,793	(29.0)
US Airways, Inc.	8,308	9,694	11,299	12,608	3,212	3,212	-	*
Virgin Atlantic Airways, Ltd.	81,074	80,698	80,183	80,095	77,463	56,474	53,356	(5.5)
WestJet	-	-	-	-	19,142	2,250	56,126	*
WOW Air	-	-	-	11,571	53,553	37,225	48,179	29.4
Discontinued Service <sup>(3)</sup>	19,166	19,126	14,405	13,237	-	-	-	*
Non-Signatory/Charter <sup>(4)</sup>	<u>7,878</u>	<u>1,713</u>	<u>1,758</u>	<u>1,300</u>	<u>2,455</u>	<u>1,177</u>	<u>4,960</u>	*
<b>Total</b>	<b>2,146,491</b>	<b>2,216,937</b>	<b>2,337,269</b>	<b>2,611,642</b>	<b>3,004,322</b>	<b>2,110,260</b>	<b>2,482,585</b>	<b>17.6%</b>

<sup>(1)</sup> In addition to the carriers shown in this table, in June 2017, Avianca will commence service from Logan to Bogota, Air Europa will commence seasonal service from Logan to Madrid and Air Canada will commence service from Logan to Vancouver.

<sup>(2)</sup> Includes Jazz Air, which is a feeder operation for Air Canada.

<sup>(3)</sup> Includes (i) Frontier Airlines, which only provided service in fiscal year 2012, (ii) Virgin America, which only provided international service in fiscal year 2013, and (iii) TACV-Cabo Verde Airlines, which discontinued service in June 2015.

<sup>(4)</sup> Includes Eurowings, which commenced service in June 2016 and stopped service by September 2016.

\* Not meaningful.

Source: Authority.

**Passenger Markets.** As of May 1, 2017, scheduled non-stop service from the Airport was offered to 77 domestic and 54 international destinations (including seasonal activity). This represents one more domestic destination since May 1, 2016. Based on published preliminary airline schedules and consideration of historical performance of actual airline operations compared to preliminary airline schedules, the Authority expects an overall 5.3% increase in total scheduled seat capacity for the last six months of calendar year 2017 compared to the same period in the prior year. This is comprised of projected increases in scheduled seat capacity for domestic and international destinations of 5.2% and 5.7%, respectively. Southwest, Air Canada, Spirit, Delta and JetBlue are all expected to increase their scheduled seats.

The destinations chosen by passengers using the Airport have changed over the years, reflecting the impacts of domestic and international economic cycles, security screening and the relative cost of air travel. The percentage of passengers traveling by air between Boston and New York/Newark has declined while international traffic and long-haul domestic traffic have increased. The percentage of origin and destination passengers does not include passengers only connecting at an airport such as JFK (e.g., JetBlue). The New York market, which includes traffic to LaGuardia, JFK and Newark, had traditionally been the Airport's largest market, but since 2010 it has fluctuated and as of December 31, 2016 it is in third place behind the Chicago and Washington, D.C markets, respectively. Demand in the Boston-New York/Newark market has decreased by approximately 26.4% from 1.9 million passengers in the 12 months ended December 31, 2006 to 1.4 million passengers for the 12 months ended December 31, 2016. During that same period, the Southeast region (Georgia and Florida), which is dominated by the Florida markets, has become the Airport's largest market area, accounting for 19.1% of origin and destination passengers for the 12 months ended December 31, 2016.

In addition, international traffic as a percentage of overall traffic was 18.2% in calendar year 2016, up from 16.5% in calendar year 2015 and 15.8% in calendar year 2014. In calendar year 2016, the top five international markets served (by scheduled seats) were London, Toronto, Paris, Dublin and Dubai. New international service from the Airport to the following destinations commenced since 2012\*:

<u>Destination</u>	<u>Service Commencement Date</u>	<u>Carrier</u>
Tokyo	April 2012	Japan Airlines
Panama City	July 2013	Copa Airlines
Dubai	March 2014	Emirates
Istanbul	May 2014	Turkish Airlines
Beijing	June 2014	Hainan Airlines
Reykjavik	March 2015	WOW Air
Hong Kong	May 2015	Cathay Pacific
Tel Aviv	June 2015	El AL
Mexico City	June 2015	Aeroméxico
Shanghai	June 2015	Hainan Airlines
Fort De France	December 2015	Norwegian Air
Pointe A Pitre	December 2015	Norwegian Air
Doha	March 2016	Qatar Airlines
Copenhagen	March 2016/ May 2016	Scandinavian (SAS)/Norwegian Air
London Gatwick	March 2016	Norwegian Air
Toronto	March 2016	WestJet
Halifax	April 2016	WestJet
Oslo	April 2016	Norwegian Air
Dusseldorf	May 2016	Air Berlin
Manchester, England	May 2016/ March 2017	Thomas Cook Airlines/ Virgin Atlantic
Lisbon	June 2016	TAP-Portugal
Bogota	June 2017	Avianca
Madrid	June 2017	Air Europa
Vancouver	June 2017	Air Canada
Montreal	October 2017 <sup>†</sup>	WestJet

\* Note: Includes existing routes served by new carriers, new routes served by existing carriers and new routes served by new carriers.

<sup>†</sup> Expected.

The following table shows the percentage of origin and destination passengers traveling on U.S. air carriers between the Airport and other final domestic destinations for the twelve months ended December 31, 2016 (the most recent 12 month period for which data is available), as reported by USDOT. Passengers traveling on international flights are not included. It also shows the comparative rankings of the top 20 domestic destinations for calendar year 2006.

**BOSTON-LOGAN INTERNATIONAL AIRPORT**  
**TOP TWENTY DOMESTIC ORIGIN & DESTINATION PASSENGER MARKETS**  
**U.S. CERTIFICATED CARRIERS**  
(12 Months Ended December 31, 2006 and December 31, 2016)

Market	12 Months Ended 12/31/16 Percentage	12 Months Ended 12/31/16 Rank	12 Months Ended 12/31/06 Rank	Major U.S. Carriers Serving Market (2016)*
Chicago, IL (ORD, MDW) <sup>(1)</sup>	5.9%	1	6	AA, D, JB, SW, SP, U
Washington DC (IAD, DCA) <sup>(2)</sup>	5.6	2	2	AA, D, JB, SW, U, VA
New York Area (JFK, LGA, EWR) <sup>(3)</sup>	5.5	3	1	AA, D, JB, SW, U, VA
SFO : San Francisco, CA	5.2	4	5	AA, AK, D, JB, SW, SC, U, VA
LAX : Los Angeles, CA	5.2	5	3	AA, AK, D, JB, SW, SP, SC, U, VA
MCO : Orlando, FL	3.5	6	4	AA, D, JB, SW, SP, U
ATL : Atlanta, GA	3.3	7	7	AA, D, JB, SW, SP, U
BWI : Baltimore, MD	3.1	8	10	AA, D, JB, SW, SP, U
Dallas/Fort Worth, TX (DFW & DAL) <sup>(4)</sup>	2.9	9	14	AA, D, JB, SW, SP, U, VA
PHL : Philadelphia, PA	2.8	10	9	AA, D, JB, SW, U
FLL : Fort Lauderdale, FL	2.7	11	8	AA, D, JB, SW, SP, U
DEN : Denver, CO	2.6	12	15	AA, AK, D, JB, SW, SP, SC, U, VA
RSW : Fort Myers, FL	2.1	13	12	AA, D, JB, SW, SP, SC, U
Houston, TX (IAH & HOU) <sup>(5)</sup>	2.1	14	21	AA, D, JB, SW, SP, U
SEA : Seattle, WA	2.0	15	19	AA, AK, D, JB, SW, SP, SC, U, VA
RDU : Raleigh/Durham, NC	1.9	16	25	AA, D, JB, SW, U
MSP : Minneapolis/St. Paul, MN	1.9	17	17	AA, D, JB, SW, SP, SC, U
TPA : Tampa, FL	1.9	18	11	AA, D, JB, SW, SP, U
MIA : Miami, FL	1.9	19	18	AA, D, JB, U
LAS : Las Vegas, NV	1.9	20	13	AA, AK, D, JB, SW, SP, SC, U, VA
Total for Cities Listed	63.7%			

(1) Includes Chicago O'Hare Airport and Midway Airport.

(2) Includes Dulles Airport & National Airport.

(3) Includes JFK, La Guardia and Newark Liberty International Airports.

(4) Includes Dallas/Fort Worth Airport and Dallas Love Field Airport.

(5) Includes Houston Intercontinental Airport and Houston Hobby Airport.

Source: DiiO: USDOT, O&D Survey.

Note: The figures above may vary slightly from those reflected in Exhibit 4-19 of Appendix C – Boston Logan International Airport Market Analysis (the “ICF Report”) due to differences in the proprietary data processing methods used by DiiO (the source for the data above) and Database Products (the source for the data in the ICF Report) to scale-up the U.S. DOT O&D Survey data.

\* Reflects all carriers providing service to the listed market; includes those that do not provide direct point-to-point service to/from Logan.

Key: American/USAir (AA); Alaska (AK); Delta (D); JetBlue (JB); Southwest (SW); Spirit Airlines (SP); Sun Country (SC); United (U); Virgin America (VA).

There are two regional airports in New England—T.F. Green Airport in Providence, Rhode Island (“T.F. Green”) and Manchester-Boston Regional Airport in Manchester, New Hampshire (“Manchester”)—that compete with Logan Airport. Logan Airport is by far the largest airport in the region with the broadest range of direct service to Europe, the Caribbean, Japan, the Middle East, Central America, China, Canada and South America. In the late 1990s and early 2000s, these regional airports gained market share primarily as a result of increased service levels and competitive airfares (largely due to Southwest). In recent years, growth of low cost service at Logan, airline retrenchment from smaller, secondary markets (such as these regional airports) and expansion of direct international service from Logan has resulted in a shift in the market dynamics between the three airports, with Logan’s passenger

traffic growing and T.F. Green and Manchester experiencing stable or decreased passenger traffic. The following table shows passenger activity at T.F. Green, Manchester and Logan Airport for the five most recent calendar years.

**Airport Passengers  
(in millions)**

<b>Airport</b>	<b>2012</b>	<b>% of Total</b>	<b>2013</b>	<b>% of Total</b>	<b>2014</b>	<b>% of Total</b>	<b>2015</b>	<b>% of Total</b>	<b>2016</b>	<b>% of Total</b>	<b>(2015-16) % Change</b>
<b>Logan Airport</b>	29.2	82.7%	30.2	82.9%	31.6	84.8%	33.5	85.5%	36.3	86.5%	8.5%
<b>T.F. Green</b>	3.7	10.3	3.8	10.4	3.6	9.6	3.6	9.2	3.7	8.7	2.2
<b>Manchester</b>	2.4	7.0	2.4	6.6	2.1	5.6	2.1	5.3	2.0	4.8	(2.9)
<b>Total</b>	<b>35.3</b>		<b>36.4</b>		<b>37.3</b>		<b>39.2</b>		<b>42.0</b>		

Source: Authority, Manchester and T.F. Green reports

**Cargo Airline Services.** The Airport plays an important role as a center for processing domestic and international air cargo. According to ACI, in calendar year 2015 (the most recent year for which data is available), the Airport ranked 22<sup>nd</sup> in the nation in total air cargo volume. As of June 30, 2016, the Airport was served by eight all-cargo and small package/express carriers. All-cargo carriers carry only cargo and these companies include ABX Air, Atlas, Air Transport International, Federal Express, Icelandair Cargo, Mountain Air Cargo, United Parcel Service and Wiggins Airways. For fiscal year 2016, the companies with the largest shares of enplaned and deplaned cargo at the Airport, based upon cargo tonnage, were Federal Express, United Parcel Service, Air Transport International (DHL), Lufthansa German Airlines, British Airways and Delta Airlines. Together, these six carriers accounted for 72.9% of total cargo and mail handled at the Airport in fiscal year 2016.

**Cargo and Mail Traffic.** In fiscal year 2016, total combined cargo and mail volume was approximately 606.1 million pounds. Total volume consisted of 55.3% small package/express, 40.4% freight and 4.3% mail. The total volume of air cargo and mail handled at the Airport decreased in fiscal year 2016 by 3.1% compared to fiscal year 2015 and increased by 9.2% in fiscal year 2015 relative to fiscal year 2014. Fiscal year 2016 cargo and mail volume was 8.7% above that of fiscal year 2012. A large percentage of total cargo volume for these periods is attributable to integrated all-cargo companies and small package/express carriers. The integrated all-cargo companies, which include Federal Express and United Parcel Service, handled approximately 56.6% of the Airport's cargo in fiscal year 2016 and 58.5% in fiscal year 2015.

**Airport Facilities**

**Airside Facilities.** As reflected in the table below, the Airport has four major runways, all of which can accept Group V types of aircraft. The Airport's two longest runways—Runway 4R/22L and Runway 15R/33L—can also accommodate Group VI aircraft (the B747-800 and the A380). In addition, it has a 5,000 foot uni-directional runway, and a 2,557-foot runway used primarily by general aviation aircraft and some small commuter aircraft. In recent years, the Authority has undertaken a number of projects to enhance safety at the Airport. These include the construction of inclined safety over-run areas at the end of three of the Airport's runways and a fire and rescue access road at the approach end of two runways that provides emergency access in the event of a water rescue operation. In addition, the Airport has an Engineered Material Arresting System (“EMAS”) installed at the end of two of its runways. EMAS is an engineered bed of ultra-light, crushable concrete blocks, designed to slow an aircraft that has overrun the end of a runway. Further, the Airport has a Foreign Object Debris detection system on one runway (Runway 9-27) and has installed runway status lights at various locations on the airfield where runway incursions (areas where an aircraft, vehicle or person has entered the runway environment without authorization) have occurred. Takeoff Hold Lights (“THLs”) and Runway Intersection Lights (“RILs”) were installed on Runways 15R and 9; and Runway Entrance Lights (“RELS”) were installed at various taxiways intersecting runways at critical locations. Status lights provide the pilots with additional safety cues beyond verbal guidance from air traffic control and work in concert with Airport Surface Detection Equipment (“ASDE”). The table below provides an overview of the Airport's runways and certain of the above-described related safety features.



<u>Runway</u>	<u>Length (ft)</u>	<u>EMAS</u>	<u>Status Lights</u>	<u>Inclined Safety Area</u>	<u>Foreign Object Debris Detection System</u>
15R/33L	10,083	Yes – at 33L	Yes (THL, RIL, REL)	--	--
4R/22L	10,005	--	Yes (REL)	Yes – at 22L	--
4L/22R	7,860	Yes – at 22R	Yes (REL)	Yes – at 22R	--
9/27	7,000	--	Yes (THL, RIL, REL)	Yes – at 27	Yes
14/32	5,000	--	--	--	--
15L/33R	2,557	--	--	--	--

The Airport also has approximately 93 acres of concrete apron, 144 acres of asphalt apron and 16.3 miles of taxiway. The airfield is equipped with a 250-foot high control tower staffed by the FAA; high intensity runway edge and centerline lights; four approach light systems; threshold lights and touchdown zone lights; airport surveillance radar; aircraft radio communication facilities; radio navigation installations; and Category III Instrument Landing Systems (“*ILS*”) operational at two runway approaches and Category I ILS systems at two other runway approaches. Navigational equipment is operated and maintained by the FAA. The Airport has a fire and rescue facility and a satellite fire and rescue facility on the airfield.

The Airport is planning significant airside facility renovations and enhancements as part of the FY17-FY21 Capital Program. See “CAPITAL PROGRAM” herein.

**Terminal Facilities.** The airport has four commercial passenger terminals (the “*Terminals*”) that provide a total of 98 gates, consisting of 97 contact gates and one non-contact gate. The Airport also has general aviation facilities located in the North Cargo Area currently occupied by Signature Flight Support. As of May 1, 2017, the Terminals in operation included:

*Terminal A.* Terminal A, which has 21 gates, opened in March 2005, with 670,000 square feet of lobby and gate space, divided between an 11-gate main terminal building and a ten-gate satellite terminal. Terminal A is currently used by Southwest, Westjet and Delta (including Delta Shuttle and Delta Connection).

*Terminal B.* Terminal B is the largest terminal at Logan with 37 contact gates and one non-contact gate, or 37% of total Airport gates. Terminal B is used by Air Canada, American/American Eagle, PenAir, Spirit Airlines and United/United Express.

*Terminal C.* Terminal C is the second largest terminal at Logan with 27 contact gates. Terminal C is used by Aer Lingus, Cape Air, JetBlue, TAP, Alaska Air, Virgin America and Sun Country.

*Terminal E.* Terminal E, which has 12 gates, including three gates providing two-level jet bridges that can accommodate Group VI aircraft, is used for all arriving international flights requiring federal inspection services and most departures by foreign flag carriers. The majority of charter flights utilize Terminal E, although charter flights also operate from other Terminals.

See the inside back cover of this Official Statement for a map of the Airport’s terminal facilities. For information regarding recently completed, ongoing and planned improvements to terminal facilities, see “CAPITAL PROGRAM” herein.

**Lease Arrangements for Terminal Facilities.** The Authority exercises significant control over Terminal facilities at Logan Airport through the leasing arrangements it has entered into with the carriers operating at the Airport. The Authority uses a combination of short-term leases, preferential use provisions, recapture provisions and forced subletting provisions to allow it to allocate its gate resources effectively and accommodate new entrant carriers.

In general, the Authority prefers to lease space on a short term basis—either on a month-to-month or year-to-year basis. This provides the Authority the flexibility to allocate gates so that carriers will maximize usage of these facilities. The Authority also has adopted a preferential gate use policy applicable to all gates at Logan Airport. Under the conditions specified in the policy, the Authority may schedule arrivals and departures at a gate by carriers other than the tenant for any period that the tenant is not using the gate. The tenant carrier must permit

the carrier being accommodated under the policy to use the facilities required for the functional use of the gate, and may assess reasonable fees for such use. If a tenant carrier fails to accommodate a carrier under the terms of the preferential use policy, then the Authority may convert the gate to a common use gate.

The table below reflects the Authority’s current lease arrangements for contact gates at the Airport. In addition to those listed below, one gate in Terminal C and all of the gates in Terminal E are currently common use. Effective December 15, 2015, the Authority’s lease with US Airways was assigned to American in connection with the merger of the two airlines and consolidation of operations under the American name.

Terminal	Carrier	# of Contact Gates	Lease Term	Expiration Date
Terminal A	Delta	16	1 year	*
	Southwest	5	Monthly	n/a
Terminal B	American	7 <sup>†</sup>	20 years	June 13, 2021
		13 <sup>†</sup>	25 years	September 30, 2023
		7	Monthly	n/a
	Spirit	2	Monthly	n/a
	United	8	1 year	**
Terminal C	Alaska Airlines	1	Monthly	n/a
	Virgin America	1	Monthly	n/a
	JetBlue	24 <sup>‡</sup>	1 year	***
<b>Total:</b>		<b>84</b>		

\* The Delta lease was entered into on July 1, 2006, with an original term of ten years. Effective as of July 1, 2016, the lease was amended to extend the term with automatic one-year extensions, until terminated by either party. Delta subleases one gate to WestJet.

\*\* The United lease was entered into on May 1, 2014, with an original term of one year and automatic one-year extensions thereafter, until terminated by either party.

\*\*\* The JetBlue lease was entered into on March 18, 2005, with an effective date of May 1, 2005 and an original term of five years with 20 automatic one-year extensions thereafter, until terminated by either party.

† American subleases five gates to other airlines: three to Air Canada and two to the Authority. The Authority currently re-leases these two gates to United.

‡ JetBlue subleases one gate to Cape Air. It also allows Aer Lingus to operate out of three of its gates pursuant to a Facility Use Agreement and allows TAP to operate out of one of its gates pursuant to a Facility Use Agreement.

The leases with Delta, American, United and JetBlue provide for the “recapture” of gates by the Authority if the tenant carrier’s average usage (measured in the number of daily operations per gate) falls below a certain Airport-wide average for such usage. These leases also generally require that, at the request of the Authority, the tenant carrier sublease a certain number of gates, as specified in the lease. The monthly leases with Southwest, Spirit, Alaska Airlines and Virgin America do not contain “recapture” language, but rather provide the Authority with the right to terminate portions of the premises on 30-days’ notice.

The Authority’s preference is to lease space on a short-term basis. The only long-term lease arrangement currently in place is with American (previously US Airways), which lease arrangement was entered into in connection with the significant capital investments the carrier made in the Authority’s Terminal B facilities. Such terminal improvements were largely financed with special facilities revenue bonds issued by the Authority for the benefit of US Airways (now American) on a non-recourse basis. American has fully repaid its special facilities revenue bonds.

**Parking Facilities.** Private automobiles are one of the primary means of ground transportation to and from the Airport. Based upon a 2016 air passenger survey, the Authority estimates that approximately 34.5% of all air passengers arrive at Logan Airport in private automobiles, and of those, approximately 33.1% (or 11.4% of total passengers) use the Airport’s parking facilities for long-term duration parking. While overall demand for on-airport

parking continues to increase, there has been growth in the use of high occupancy vehicles (“HOV”) and transportation network companies (“TNCs”) and declines in Logan air passenger private vehicle use. A majority of the decline in air passenger private vehicle use is from the use of TNCs, limousines and HOVs, including private buses and Framingham and Braintree Logan Express park-and-ride services.

The number of on-airport commercial and employee parking spaces is currently limited to 21,088, of which 18,640 spaces are currently designated for commercial use and 2,448 spaces for employee parking. These limitations (the “SIP Parking Limitation”) are pursuant to the State Implementation Plan (“SIP”) filed by the Commonwealth in 1975 (and amended in 1990) with the United States Environmental Protection Agency (“EPA”) under the federal Clean Air Act. Under the Airport SIP Parking Limitation, the Authority may shift the location of on-Airport parking spaces or convert the use of spaces from employee use to commercial use. Once parking spaces have been converted from employee to commercial use, however, they cannot be converted back to employee use. There is no regulatory limit on the number of parking spaces that are available to the rental car industry at the Airport. In compliance with the terms of the Airport SIP Parking Limitation, in January 2016, the Authority completed construction of 2,050 additional parking spaces at the Airport including an expansion to the west side of the Central Parking Garage.

The Authority formally requested an amendment to the Airport SIP Parking Limitation in June 2016. In March 2017, the Department of Environmental Protection released an amended regulation adding an additional 5,000 spaces to the SIP Parking Limitation for public comment. The Authority anticipates that the amendment process with the Commonwealth will conclude in the summer of 2017. In addition to an amendment to the Airport SIP Parking Limitation, the Authority also plans to seek environmental approval from the Executive Office of Energy and Environmental Affairs to build additional parking capacity at Logan. It is anticipated that the Authority will receive environmental approval to start construction in the early fall of 2018. For information regarding the additional planned parking improvements, see “CAPITAL PROGRAM – Authority Funded Capital Projects – Logan Airport Improvements – *Improvements to Facilitate Airport Parking*” herein.

The Board has approved increases in parking rates through July 1, 2021 to support the operational and capital construction needs of the Airport, including, in particular, to support the new debt and increase in pay-as-you-go capital required under the FY17-FY21 Capital Program. See “CAPITAL PROGRAM” herein. In particular, the Board voted to increase Logan Airport parking rates by \$3.00 per day effective July 1 in each of the years 2016, 2017, 2019 and 2021. These increases impact all on-Airport commercial parking, including the Economy Parking Garage, as reflected below:

	<b>Logan Airport Maximum Daily Parking Rates (Effective July 1,)</b>					
	<u># of Spaces</u>	<u>2015</u>	<u>2016</u>	<u>2017</u>	<u>2019</u>	<u>2021</u>
Central Parking Garage	12,494	\$29.00	\$32.00	\$35.00	\$38.00	\$41.00
Terminal B Garage	2,212	29.00	32.00	35.00	38.00	41.00
Terminal E Lots	486	29.00	32.00	35.00	38.00	41.00
Economy Parking	3,448	20.00	23.00	26.00	29.00	32.00

The Authority’s current financial forecast assumes slight decreases in parking exits in each year in which a rate increase occurs, consistent with the Authority’s historic experience in connection with prior parking rate increases. See “MANAGEMENT’S DISCUSSION OF FORECAST ASSUMPTIONS – Airport Properties.” While the Authority cannot predict the impact the planned increase in Logan Airport parking rates will have on demand for parking at the Airport, management believes the planned increases will not result in a significant decrease in parking exits in the long term.

**Cargo Facilities.** As of March 31, 2017, Logan Airport’s cargo facilities include six buildings containing approximately 250,928 square feet of warehouse space. Tenants of cargo facilities at the Airport include Federal Express (occupying 99,564 square feet of warehouse space), American, United, Delta, Quantum Aviation Services,

United Parcel Service, Southwest and Swissport. The majority of the remaining cargo and passenger airlines contract services with the above listed cargo processing tenants in various areas of the Airport.

**Aircraft Fuel Systems.** Aircraft fuel is currently stored in and distributed through an integrated fuel storage and distribution system, which provides for a redundant underground distribution system for aircraft fuel to all gates at the Terminals. The fuel system, financed with special facilities revenue bonds of the Authority, is leased to BOSFUEL Corporation (“*BOSFUEL*”), a membership corporation whose members consist of the principal air carriers serving the Airport, and the system is operated by Swissport, Inc. See “OTHER OBLIGATIONS – Special Facilities Revenue Bonds.” The lease between the Authority and BOSFUEL requires BOSFUEL to pay ground rent and other fees for the use of the fuel system, including amounts sufficient to pay the debt service on the BOSFUEL Bonds (defined herein), and BOSFUEL is responsible for the operation and maintenance of the fuel system.

**Service and Support Facilities.** Airport service and support facilities currently include two facilities for preparation of in-flight meals, a Hilton hotel, a Hyatt conference center and hotel and five aircraft maintenance hangars. Recently constructed in the southwest service area (“*SWSA*”) of the Airport is the new Rental Car Center (“*RCC*”), which opened in September 2013. The RCC provides integrated airport-related rental car operations and facilities by consolidating at the RCC all 11 rental car brands serving the Airport. The RCC is a consolidated rental car facility, consisting of a four-level garage with ready/return spaces, a customer service center, seven acres of quick-turn-around (“*QTA*”) fueling and cleaning facilities and nine acres of on-site rental car storage. The RCC is served by a common bus fleet of clean fuel vehicles that also serves the MBTA Blue Line (Airport Station) riders. See “Ground Access to the Airport” below.

In addition, the Authority operates field maintenance facilities, a water pumping station, electrical substations and distribution system, and a plant that supplies steam, hot water and chilled water. The Authority currently has a long-term agreement with NStar, pursuant to which NStar provides wholesale electrical distribution services to the Authority. With respect to electric supply, the Authority currently has Master Power Agreements in place with five suppliers for a term of six years beginning on January 1, 2016, and currently has transaction agreements for base load supply in place with two of these suppliers, each for a term of three years effective January 1, 2016. Additionally, the Authority purchases ancillary services and a portion of its electricity needs from the Independent Systems Operator of New England (ISO-NE) managed energy markets.

The Authority has installed in excess of 900kw of renewable energy generation systems on its properties. In fiscal year 2016, these generation sites produced in excess of 1,995MWh of electricity, offsetting 840 metric tons of Carbon Dioxide (CO<sub>2</sub>) equivalent. The Authority’s renewable energy generation portfolio includes both wind and solar generation systems. These projects are funded internally as well as through long-term power purchase agreements generated through public/private partnerships.

**Ground Access to the Airport.** Access between the Airport and the central business district of Boston and the western and southern suburbs requires transportation under Boston Harbor. The Ted Williams Tunnel (“*Ted Williams Tunnel*”), which is owned and operated by the Massachusetts Department of Transportation (“*MassDOT*”), provides direct highway access between the Airport, the Massachusetts Turnpike/Interstate Route 90 (the “*Massachusetts Turnpike*” or “*I-90*”), the Southeast Expressway/Interstate Route 93 (“*I-93*”) and Boston’s South Station passenger rail and intercity bus terminal. The Sumner Tunnel (the “*Sumner Tunnel*”) and Lieutenant William F. Callahan Tunnel (the “*Callahan Tunnel*”) lie side-by-side and function as a single tunnel, with the Callahan Tunnel leading from downtown Boston to East Boston and the Airport, and the Sumner Tunnel leading from East Boston and the Airport to I-93 northbound, Storrow Drive and other points in downtown Boston. Route 1A/McClellan Highway, a major arterial roadway, provides access between the Airport and points northeast. Both the Ted Williams Tunnel westbound and the Sumner Tunnel are tolled facilities owned and maintained by MassDOT.

The Authority encourages the use of alternatives to private automobile transportation through public information and advertising campaigns and the development of reliable and innovative alternative transportation services. As part of its planning to enhance Airport roadway efficiency and terminal curbside utilization while protecting environmental quality, the Authority operates the “Logan Express” scheduled bus service between the Airport and four suburban park-and-ride locations: Framingham, Braintree, Woburn and Peabody. In April 2014, the Authority launched a new express shuttle bus service from Boston’s Back Bay area, providing another

alternative for passengers traveling to Logan Airport (although branded Back Bay Logan Express, this shuttle bus service does not serve a parking facility). To further encourage the use of its Logan Express service, the Authority has expanded the number of service hours at all four suburban park-and-ride locations, and added late night and early morning hours. The Authority continues to offer holiday promotions and to promote Logan Express service during peak vacation periods. The Authority has made significant improvements to its Framingham site, including the construction of a new garage, which was completed in April 2015 with 1,100 spaces. In addition, the Authority has spent a total of \$46.0 million to acquire and improve the Braintree Logan Express site, which it acquired through eminent domain on January 6, 2014.

In addition to Logan Express, the Authority has contracted for the operation of free shuttle bus service from the Terminals to the MBTA Airport Blue Line station and the RCC, and also to the Authority's on-Airport Economy Garage and remote employee parking lots. Similarly, the Authority provides free shuttle service between the Terminals and the Airport's Water Transportation Dock—an on-demand water taxi service to downtown Boston runs year round, weather permitting, from this location. The MBTA operates additional scheduled water shuttle service from the Commonwealth's South Shore communities to the Airport.

The MBTA also provides service to Logan Airport through the Silver Line, a bus rapid transit service that originates at South Station and also serves the South Boston Waterfront/Seaport District (the location of the Boston Convention & Exhibition Center). The shuttle service is free for Logan Airport customers boarding at the Airport, and allows for a free transfer to the MBTA's Red Line subway at South Station.

In February 2017, the Authority entered into operating agreements with two TNCs, Uber Technologies, Inc. ("*Uber*") and Lyft, Inc. ("*Lyft*"), pursuant to which such TNCs are now permitted to pick up passengers at the Airport, with a per-pick up fee being paid to the Authority. The Authority plans to monitor all modes of ground transportation to assess the potential impacts from TNCs, however, at this time, the Authority cannot predict what impact those operations will have on other ground transportation services and parking at the Airport. See "AVIATION INDUSTRY CONSIDERATIONS – Growth of TNCs."

In May 2017, the Authority announced additional commitments to increase ground access to Logan Airport and reduce emissions over the next ten years, including purchasing and maintaining additional Silver Line buses, increasing the capacity of the Logan Express service, increasing the HOV goal from 30.5% to 40%, electrification of the ground service equipment (GSE), increasing the number of electric vehicle charging stations in Logan Airport garages and promoting the use of electric vehicles among the TNC, taxi and livery pools.

## **Hanscom Field**

Hanscom Field is located principally in the Town of Bedford, Massachusetts, approximately 15 miles northwest of Boston. It encompasses approximately 1,300 acres, of which about 21 acres are occupied by the United States Air Force. Hanscom Field has two principal runways of 5,107 and 7,011 feet, respectively, hangars, a terminal building, taxiways and ramps. The Air Force owns approximately 872 acres adjacent to Hanscom Field. In July 1974, the Authority assumed full responsibility for operating and maintaining the airfield by agreement with the United States Air Force.

Hanscom Field is a corporate jet reliever for Logan Airport. It is anticipated that Hanscom Field will continue to develop as an alternative to the Airport for general aviation and may accommodate niche commercial passenger service. General aviation operations, including business-related activity, charters and light cargo, as well as flight training and recreational flying, currently represent 99% of the activity at Hanscom Field; military aircraft conduct about 1% of the operations. For fiscal year 2017, through March 31, 2017, Hanscom reported 86,768 total operations, of which 28,488 operations were local (Touch and Go), 25,835 were single engine operations and 19,836 were jet operations. The airfield is currently served by three full service fixed base operators, as well as several limited service fixed base operators. As of March 31, 2017, Hanscom Field had 324 aircraft based on site.

## **Worcester Regional Airport**

On July 1, 2010, the Authority purchased the Worcester Regional Airport, which is located approximately 53 miles west of Logan Airport, for approximately \$15.5 million, in accordance with the terms of Chapter 25 of the Acts of 2009, as amended (the “*Transportation Reform Act*”), and assumed responsibility for all capital and operating costs thereof.

As of March 31, 2017, Worcester Regional Airport had 61 aircraft based on site and a total of 36,021 operations were recorded for fiscal year 2016, ranging from small single-engine aircraft to large corporate business jets to one large commercial airline (JetBlue). The Authority continues to actively engage in recruiting additional commercial airlines to serve Worcester Regional Airport. In November 2012, Rectrix Commercial Aviation Services, Inc. (“*Rectrix*”) began operating as a full service fixed based operator at Worcester Regional Airport. Rectrix operates out of a 27,000 square foot facility that was newly constructed and completed in November 2015, providing full service fixed base operations as well as the base for the maintenance operation for its growing corporate fleet. Rectrix plans to commence commercial air service from Worcester Regional Airport by early 2018, with scheduled flights to Washington/Baltimore (BWI) and Sarasota, Florida.

On November 7, 2013, JetBlue began commercial service from Worcester Regional Airport. Since commencement of service, it has served over 385,000 passengers, including 119,072 passengers in calendar year 2015 and 116,627 passengers in calendar year 2016. JetBlue provides two daily flights to Florida and plans to add a daily flight to New York’s JFK airport by the end of 2017.

See “CAPITAL PROGRAM – Authority Funded Capital Projects – Worcester Airport and Hanscom Field Improvements” for information on planned improvements at Worcester Regional Airport and Hanscom Field.

## **PORT PROPERTIES**

The Authority owns, develops, operates and maintains Port Properties comprising certain waterfront properties transferred to it from the Commonwealth in 1959, as well as additional properties subsequently acquired. The Authority’s Maritime Department manages (i) a cargo terminal containing 1,850 feet of berthing space with a water depth ranging from 35 to 45 feet, which terminal is equipped with six low profile ship-to-shore (STS) cranes and (ii) a cruise ship passenger terminal. The Authority’s Real Estate and Asset Management Department plans, develops and manages related maritime properties in the Port, including real estate for maritime, industrial and commercial uses. The Authority believes that in the long-term, this diversified land use strategy will provide a non-maritime revenue stream to finance the continuing capital development of the Port’s cargo and passenger terminals, reducing the burden on the Authority’s other revenue sources. The Authority views the Port Properties as an important component of its goal to facilitate the participation of the Massachusetts economy in international trade and tourism.

In fiscal year 2016, the Port Properties accounted for approximately 14.0% of the Authority’s Revenues and approximately 5.4% of the Authority’s Net Revenues (as defined in the 1978 Trust Agreement).

### **Maritime Properties**

The Authority owns, manages, develops, operates and markets the public cargo and passenger terminals and related maritime properties of the Port. Boston is New England’s major port and the only port in the region providing a full range of container handling, cruise ship, bulk, breakbulk, automobile processing, petroleum, and ship repair services. The Authority’s maritime business activities include cargo handling (including containers, bulk materials and automobiles), serving as a home port and port of call for cruise ships, and leasing property for maritime industrial uses.

Cargo activity during fiscal years 2011 through 2016 and for the nine-month periods ending March 31, 2016 and March 31, 2017 is summarized in the table below. Declines in bulk tonnage for the nine-month periods ending March 31, 2016 and March 31, 2017 reflect increased competition from other ports and less suburban

residential construction. The decline in automobiles for the nine-month period ending March 31, 2017 is largely due to declines in West African demand for automobiles.

**PORT OF BOSTON CARGO ACTIVITY**  
(Fiscal Years Ended June 30, except as noted)

<u>Port Activity</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>Nine Months Ended 3/31/2016</u>	<u>Nine Months Ended 3/31/2017</u>
Containers <sup>(1)</sup>	107,477	110,163	116,800	125,809	140,967	106,556	107,840
Automobiles <sup>(2)</sup>	37,215	46,166	57,662	57,522	59,740	45,460	36,921
Bulk Tonnage	144,430	121,890	182,714	155,415	110,673	81,155	72,576

(1) Does not include over-the-road volumes.

(2) Does not include vehicles entered by over-the-road means.

Source: Authority reports.

All container operations are consolidated at Conley Terminal in South Boston with related chassis rental and repair services at Fargo Street Terminal North. The former Moran Terminal, Medford Street Terminal and Mystic Piers in Charlestown are now collectively leased to Boston Autoport LLC (“*Boston Autoport*”) and function as an automobile import, export, preparation, processing and distribution facility as well as a bulk cargo facility.

**Conley Terminal.** Conley Terminal, a 101-acre facility in South Boston, is served via direct call by 12 of the world’s top 15 ocean carriers, including APL, China COSCO Shipping Corporation Limited (“*COSCO Shipping*”), CMA CGM, Evergreen Line, Hapag-Lloyd, K Line, Maersk Line, Mediterranean Shipping Company, Mitsui O.S.K. Lines, NYK Line, OOCL and Yang Ming. Container volume is closely tied to overall economic conditions in Massachusetts, New England and international markets. The Port of Boston is currently ranked as the 12<sup>th</sup> largest container port on the Atlantic Coast of the U.S. by container volume.

The Authority is in the initial stages of modernizing Conley Terminal to better service the larger container vessels that are currently operating on the trade lanes that Conley Terminal serves. The modernization project includes both waterside and landside infrastructure improvements. On the waterside, the Authority is partnering with the Army Corps of Engineers (“*USACE*”) and the Commonwealth to deepen Boston Harbor to accommodate the larger container vessels. The so-called Boston Harbor Deep Draft Navigation Improvement Project (the “*Deep Draft Project*”) involves the deepening of the major entrance channel, the Main Ship Channel and the Reserved Channel of Boston Harbor, which will allow larger container ships to call Conley Terminal.

The Deep Draft Project is expected to cost approximately \$350.0 million. The federal government is expected to be responsible for approximately \$220.0 million of the total cost, which will be facilitated through an appropriation by the United States Congress to the USACE’s budget; the remaining \$130.0 million is expected to be funded by the Commonwealth’s MassDOT (\$75.0 million) and the Authority (\$55.0 million). The \$55.0 million expected to be financed with Authority funds is included in the FY17-FY21 Capital Program. See “CAPITAL PROGRAM – Authority Funded Capital Projects – Maritime Improvements.” The Authority is currently working with the Commonwealth to determine the timing of receipt of the Commonwealth’s MassDOT portion of the project funding. The Deep Draft Project was allocated a new construction start and appropriated \$18.2 million in federal funding in the USACE’s FY17 work plan. With this designation and funding, the Authority and MassDOT expect to enter into a Project Partnership Agreement (“*Deep Draft PPA*”). The Deep Draft PPA will be a legally-binding, tri-party agreement between the Authority, MassDOT, and the USACE that describes the project and the responsibilities of (i) the Federal government acting by and through the USACE, and (ii) the Authority and MassDOT, as the non-Federal sponsors, in the cost sharing and execution of work for the Deep Draft Project.

In addition to the Deep Draft Project, the Authority plans to expand Conley Terminal onto the adjacent property acquired by the Authority in December 2008 and build a new, deeper Berth 10 with larger cranes and deepen the existing Berth 11. It is expected that the Deep Draft PPA will require the Authority, at its sole cost, to dredge two (2) berths at the Conley Terminal to a depth of 50 feet each, and the FY17-FY21 Capital Program includes funding for the dredging of Berth 11 and the design and permitting of Berth 10 to such depth. Additional improvements include (i) the construction of a dedicated freight corridor (the Thomas Butler Bypass Road) to

service Conley Terminal, and (ii) critical infrastructure repairs and equipment upgrades to modernize Conley Terminal, including Berth 11 rehabilitation, Berth 12 fender repair, Berths 11 and 12 backland repairs, refrigerated container storage improvements, terminal technology and equipment upgrades, Berths 14-17 bulkhead rehabilitation and new gate processing facilities.

The planned improvements discussed in the preceding paragraph are currently expected to cost a total of approximately \$392.9 million, consisting of (i) \$75.0 million for the construction of the dedicated freight corridor and enabling projects, (ii) \$102.9 million for the Conley Terminal infrastructure repairs and equipment upgrades as well as the dredging of Berth 11, and (iii) \$215.0 million relating to the construction of Berth 10 and the purchase and installation of three new cranes large enough to serve the ships expected to call on Conley Terminal. The dedicated freight corridor has been funded by Authority internally generated funds, and is expected to be complete and in service by September 2017. With respect to the Conley Terminal infrastructure repairs, equipment upgrades and Berth 11 dredging, the Authority was recently awarded a \$42.0 million FASTLANE grant by the USDOT to pay for a portion of the \$102.9 million total project costs. The Authority expects to finance the remaining \$60.9 million of these project costs with a combination of Authority funds (\$60.3 million, of which \$46.0 million is included in the FY17-21 Capital Program and the remainder will be included in future capital programs), and EPA grant funds (\$0.6 million). See “CAPITAL PROGRAM – Authority Funded Capital Projects – Maritime Improvements.” In the summer of 2016, \$107.5 million was authorized in the Commonwealth’s Economic Development Bill to help fund the construction of Berth 10 and the procurement of three new cranes. The Authority is still evaluating available funding alternatives for the remaining project costs.

**Boston Autoport.** This 80-acre facility in Charlestown is leased to Boston Autoport LLC (“*Boston Autoport*”) through June 2051. Boston Autoport is the only automobile processing entity using the Port. Increased domestic production by foreign automakers has reduced vehicle imports into the United States by water. However, Boston Autoport continues to import and store Subarus and other automobiles as well as to export used automobiles, and to pursue other complementary marine industrial subtenants, while making base lease payments to the Authority and receiving other revenues from subleases on the site. Boston Autoport has a number of subtenants on its lease area, including Massachusetts Clean Energy Technology Center, which operates a 46,000 square foot facility to test wind blades to meet certification and investor requirements and support wind industry research and development activities. The Massachusetts Clean Energy Technology Center facility began operating in July 2011.

**Flynn Cruiseport Boston.** Formerly called the Black Falcon Cruise Terminal, this terminal at the former Boston Army Base in South Boston opened in 1986. In 2011, the Authority completed an \$11.0 million renovation of the terminal that included improvements in passenger amenities, safety and lighting. In 2015, a \$3.2 million renovation of the terminal warehouse area added new bathrooms and improved the ventilation, heating and lighting to facilitate ticketing and baggage functions at the terminal. In 2017, the entire exterior of Flynn Cruiseport Boston will be painted and new signage will be installed to enhance operational efficiencies and to formally acknowledge the 2016 renaming of the terminal for former City of Boston Mayor Raymond L. Flynn. The table below reflects total passenger volume at Flynn Cruiseport Boston for each of calendar years 2012 through 2016:

**FLYNN CRUISEPORT BOSTON VESSEL AND PASSENGER VOLUME**  
(Calendar Year Ended December 31)

	<u># of Calls</u>	<u>Total Passengers</u>
2012	117	380,054
2013	116	382,885
2014	113	315,030
2015	114	328,305
2016	114	309,027

The Atlantic coast cruise market is dominated by Florida ports, which handle over 79% of all cruise passengers. In calendar year 2016, the Port of Boston ranked as the 8<sup>th</sup> busiest cruise port on the U.S. Atlantic Coast with 2% of all cruise passengers. Cruise activity from the Port of Boston includes sailings to Bermuda, multiple locations in Canada and limited sailings to the Caribbean. The decrease in total passengers in calendar year 2014, was due to the loss of the Carnival Glory, which provided service from Boston to Nova Scotia in calendar years 2012 (85,059 total passengers) and 2013 (70,741 total passengers). In calendar year 2014, the Carnival Glory was repositioned to Miami to provide service to the Caribbean. The decrease in calendar year 2016 compared to calendar



year 2015 was a result of the Norwegian Dawn undergoing extensive renovation that delayed the first call and resulted in six missed turns.

## **Commercial and Maritime Real Estate Properties**

**South Boston Commercial and Residential Development.** The Authority owns approximately 65 acres of land in the South Boston Waterfront (the “*Waterfront*”), also known as Boston’s Innovation District, including approximately 5.6 million square feet of commercial development, including office, hotel, retail/restaurant, and meeting space. Development in the Waterfront has been experiencing rapid growth of commercial construction, building openings, major tenant relocations and land transactions. The Authority has actively redeveloped a portion of its land in the Waterfront as part of a larger mixed-used plan for approximately nine million square feet of office, hotel, restaurant/retail and residential development.

Since the mid-1980s, completed projects on Authority land that is ground leased to developers include the World Trade Center/Commonwealth Pier (250,000 square feet of exhibition and conference space and 600,000 square feet of office space), the Seaport Hotel (427 rooms), the East and West Office Buildings (490,000 square feet and 560,000 square feet, respectively), the John Hancock U.S. headquarters office building (471,000 square feet), the Boston Harbor Industrial Development leasehold (784,000 square feet), the Park Lane Seaport Apartments (465 apartment units), the Renaissance Boston Waterfront Hotel (471 rooms), and the construction of new roadways, utilities and the South Boston Maritime Park on D Street. Liberty Wharf, which opened in 2011, is a multi-use development containing five restaurants, boutique office space, a public harbor walk and water slips for transient vessels. Waterside Place Phase I, a residential development with 236 apartment units, opened in January 2014; Phase II of the project is in design and permitting and expected to commence construction in the second quarter of 2018. The development program includes 312 apartment units and ancillary parking and retail uses.

The Waterfront is home to the Boston Convention & Exhibition Center (“*BCEC*”), as well as major businesses, including but not limited to: AEW, Cabot Corporation, Fidelity Investments, General Electric, Goodwin Proctor, John Hancock, PricewaterhouseCoopers, and Vertex Pharmaceuticals. In addition, the MBTA’s Silver Line provides bus rapid transit service from South Station to the Waterfront (and on to Logan Airport), with two stations located on Authority-owned property in the Commonwealth Flats district.

As part of the FY17-FY21 Capital Program, the Authority is constructing the South Boston Waterfront Transportation Center that will provide approximately 1,550 parking spaces for the Waterfront. See “CAPITAL PROGRAM – Authority Funded Capital Projects – Real Estate Improvements” herein. In addition, the Authority continues to move forward with the development of an approximately 1,050-room luxury hotel located on Parcel D-2, which parcel is owned by the Authority and located on Summer Street opposite the BCEC. See “CAPITAL PROGRAM – Third Party Funded Capital Projects.”

**Fargo Street Terminal South.** In March 2010, the Authority and Boston Harbor Industrial Development LLC (“*BHID*”) entered into a 75-year ground lease for approximately 38 acres of land that abuts the Reserved Channel. The property contains approximately 761,000 square feet of building area in seven existing buildings that house a variety of industrial/warehousing tenants and other similar uses. A predecessor entity to BHID had been leasing this site since 1965 under a prior ground lease with the Authority. In addition to substantially increased ground rent to the Authority, the lease required BHID to make substantial investments in roadway and seawall infrastructure improvements, which were completed in 2014. BHID has proposed additional investments in the existing buildings and re-developing a portion of the site.

**Boston Fish Pier and South Boston Seafood Cluster.** The Boston Fish Pier provides approximately 100,000 square feet of fully leased seafood processing space and 60,000 square feet of office space, roughly half of which is occupied by Massport Maritime Department administrative and public safety functions and maritime-related tenants. The Fish Pier is the home of Boston’s commercial fishing fleet, and is expected to remain so for the foreseeable future. In 1996, the Authority designated a minimum of eight acres at the Massport Marine Terminal (“*MMT*”) in South Boston for state-of-the-art seafood-processing facilities. Harbor Seafood Center, the first phase of the new district, opened in 2001 and is fully occupied. The Legal Sea Foods Quality Control Center is also located within this district.

The Authority issued a Request for Proposals on February 1, 2016 to develop portions of the MMT for seafood, warehouse, bulk and other maritime industrial uses, awarding parcels within this district to Cape Cod Shellfish and Pilot Development to construct modern seafood-centric facilities. In addition, the Authority is working with Millennium Partners to construct a new headquarters and seafood processing facility for Stavis Seafoods at the site (See “Other Maritime Facilities” below).

**Other Maritime Facilities.** The Authority controls several facilities that are used for warehousing, or for importing, processing or distributing bulk and other waterborne commodities such as cement and seafood. These facilities include 88 Black Falcon (an intermodal cargo warehouse and office facility), MMT (40 acres) and the Fargo St. Terminal North (13 acres). The MMT site is home to the corporate headquarters of Legal Sea Foods and the Harbor Seafood Center, a 68,000 square foot multi-tenant facility. In addition, MMT is the location of several planned seafood facilities and the Authority uses portions of the site to meet cruise and other operational needs. (See “Boston Fish Pier and South Boston Seafood Cluster”).

**Constitution Center.** Constitution Center is a multi-tenant, low-rise office property located in the Gateway area of Charlestown. The property consists of three buildings containing approximately 179,000 aggregate square feet located on approximately 8.4 acres of land. The property also has approximately 470 surface parking spaces. The property is leased from Massport under two ground leases, both of which run through 2082, including all option terms.

**Constitution Marina.** Constitution Marina is located adjacent to Constitution Center and its leasehold consists primarily of the water sheet (approximately 4.6 acres in area). Constitution Marina has approximately 260 vessel slips and a clubhouse, and operates 12 months a year. The Constitution Marina’s lease expires in 2024.

**East Boston Waterfront Properties.** The Authority has entered into agreements with Roseland Property Company (“*Roseland*”) to redevelop East Boston Pier One and adjacent shore parcels into a multi-phase residential development that will include parking, retail, amenity space and community space. Site work commenced in 2006, however development of this project was delayed due to the economic downturn in 2007. Construction resumed in 2013, and the first building opened in December 2014. Construction on the next two buildings commenced in October 2015 and is due to be complete by the second quarter of 2018. In the meantime, Roseland and the Authority are studying the feasibility of the third and final phase of residential development on the Pier itself, in light of significant structural costs associated with the Pier.

The Authority also designed and constructed a park on Pier 4 known as “East Boston Piers Park.” Phase I of the park opened to the public in 1995. The Authority is now considering development of Phase II of the Park on adjacent shore parcels. The Authority also has entered into a long-term ground lease with Coastal Marine Management to operate, maintain and improve the East Boston Shipyard and Marina. Within the terms of the ground lease, the tenant is required to undertake significant capital improvements to the properties.

## STRATEGIC PLAN

During fiscal year 2013, the Members of the Authority voted to undertake the “*Massport 2022*” strategic planning initiative to help guide the future of the Authority in the coming decade and beyond. This initiative involved Authority staff, the surrounding community, MassDOT and the Authority’s other stakeholders in the cooperative, community discussion about how the Authority can best achieve its mission of promoting economic prosperity in a dynamic, highly competitive and ever-changing and expanding global environment. The strategic planning initiative constituted a comprehensive review of all of the Authority’s aviation, maritime, real estate and employee assets and outlines concrete actions that benefit the Authority’s customers and the community in the fairest and most effective way possible, balancing the Authority’s specific goals with the larger objectives of the City of Boston, the Commonwealth and the entire New England region.

Pursuant to the Massport 2022 strategic initiative, during fiscal years 2013 and 2014, the Authority engaged in a 24-month effort to prepare a unified Strategic Plan (the “*Plan*”) for all of its facilities, which Plan was adopted by Members of the Authority in November 2014. The goal of the Plan was to support and allow Logan Airport to serve the needs of its rapidly growing passenger base and to enable the Conley Terminal to prepare for the larger ships and consolidated shipping lines that are expected to appear after the opening of the expanded locks in the

Panama Canal. The Plan also examines how best to position the Authority’s real estate holdings in East Boston and South Boston that are not required for aviation or maritime uses. The Plan identifies the following key opportunities aimed at achieving these goals, among others:

Investing in the Authority’s Airports:

- Accommodating the rapid passenger growth at Logan Airport through (i) further development of the Airport terminal complex for domestic and international passengers and (ii) continued improvements to ground access to the Airport through the further promotion of high occupancy vehicle (HOV) initiatives and continued management of the on-Airport parking supply in order to meet the growth in air passengers;
- Enhancing security at Logan Airport through the construction of a consolidated vendor delivery inspection station and joint operations center;
- Improving technology to improve the passenger experience at Logan Airport;
- Building the commercial passenger market at Worcester Airport (Worcester being New England’s second largest city); and
- Continuing Hanscom Field’s role as a premier corporate and business aviation facility for the Boston and New England region and an important commercial/general aviation facility.

Revitalizing the Maritime Mission

- Making Conley Terminal “big ship ready” through (i) the Boston Harbor dredging project (the Deep Draft Project), and (ii) investment in new berths, container gantry cranes, backlands and landside transport access, including a new dedicated freight corridor;
- Improving Flynn Cruiseport Boston to accommodate the growth in cruise passenger activity, including (i) terminal improvements and (ii) securing control of Black Falcon Avenue and (iii) providing adequate cruise parking; and
- Optimizing maritime use of Fish Pier and assessing the seafood industry’s future needs.

Developing and Protecting Massport’s Real Estate Assets

- Constructing the South Boston Waterfront Transportation Center in South Boston;
- Maximizing real estate revenue to support maritime investments; and
- Implementing the recommendations from the Disaster and Infrastructure Resiliency Plan (DIRP) study, which identified improvements designed to make the Authority’s buildings, facilities and infrastructure more resilient to withstanding threats and hazards.

The Plan provides a framework for prioritizing the Authority’s strategies and investments moving forward; the specifics have been and continue to be adjusted as necessary to respond to the rapidly changing environment in which the Authority operates. Since the Plan was approved, staff has been working and continues to work to develop specific business plans designed to address and implement the strategic initiatives. The Plan has helped shape each capital program since fiscal year 2015, including the FY17-FY21 Capital Program (defined below), and the more detailed business plans will shape subsequent capital plans.

## **CAPITAL PROGRAM**

The Authority utilizes a rolling, five-year capital program as its comprehensive and coordinated capital improvement and financial master plan for all Authority facilities. The capital program, which is amended and approved by the Board annually, sets forth the planned capital projects and expected sources of funding therefor for the next succeeding five-year period. While the Board annually approves a five-year capital program as a whole, each individual project within the capital plan is its own “module,” the scope of and budget for which must be approved separately by the Board before work on such module is commenced.

Many of the commitments within the Authority’s capital plan, such as renovations and enhancements to Terminal E contained in the current capital program (discussed further below), have already been authorized by the Authority and extend over several years. The modular design of the capital plan, however, allows the Authority to continually monitor and make adjustments to the overall program, even after work on individual projects has

commenced. If significant changes were to occur in available amounts from expected funding sources, or if the costs of certain projects were to increase significantly, the Authority would adjust the timing or reduce the scope of individual proposed projects or the overall program, or both, to accommodate such changed circumstances.

The modular design of the capital plan also allows the Authority to react quickly to external factors that affect Authority operations. For example, in October 2001, as part of its financial recovery plan in response to the financial and operational implications of the events of September 11, 2001, the Authority successfully postponed projects and reduced the capital program for fiscal years 2001 through 2006 from a six-year plan to a two-year plan. More recently, passenger growth at the Airport continues to outpace expectations, and the modular design of the capital plan has allowed the Authority to accelerate certain projects that are most important for accommodating the increase in passengers. The Authority believes that the modular design of the capital program significantly increases its ability to make adjustments in capital spending levels, if necessary.

On February 16, 2017, the Authority approved the Fiscal Year 2017-2021 Capital Program (the “*FY17-FY21 Capital Program*”). The FY17-FY21 Capital Program represents a comprehensive and coordinated capital improvement and financial master plan for all Authority facilities. The program was developed to be consistent with the Plan and the Authority’s strategic goals of meeting growing demand at Logan, protecting the future of the Maritime container and cruise lines of business and defining the role of the commercial real estate properties, while maintaining strong financial management and competitive rate structures, being a good neighbor, planning for increased resiliency, prioritizing security and improving customer service levels in the face of rising demand. Specifically, the FY17-FY21 Capital Program funds major initiatives that support the Authority’s strategic goals such as:

Supporting Logan’s Ability to Handle Increased Passengers:

- Completing programmed airfield improvements and HVAC equipment upgrades;
- Aiding the expansion of low cost carriers at Logan by expanding and relocating airlines to achieve consolidation;
- Renovating and enhancing Terminal E to serve the international market needs and accommodate the A380 aircraft;
- Improving traffic conditions for vehicles entering Terminal C and exiting Terminal B by improving the Terminal C Roadways;
- Optimizing Terminal B to facilitate airline consolidation and undertaking renovations to improve passenger flow;
- Addition of a parking facility at Logan supporting an additional 5,000 spaces; and
- Phase 1 of Terminal E Modernization, adding four new gates.

Safety and Security:

- Implementing security enhancements throughout all of the Authority’s facilities, including construction of Joint Operations Center at Logan.

Fostering the Development of the Working Port and Developing the Authority’s Real Estate Assets:

- Boston Harbor dredging;
- Construction of a dedicated freight corridor at Conley Terminal; and
- Constructing the South Boston Waterfront Transportation Center.

In addition, the FY17-FY21 Capital Program includes the installation of a Category III ILS and taxiway improvements at Worcester Airport, construction of the airfield rescue and firefighting (“*ARFF*”) facility and customs and border protection (“*CBP*”) facility at Hanscom Field, and the maintenance and renewal of its existing facilities, all as more fully described below.

The FY17-FY21 Capital Program includes forecasted total expenditures of approximately \$2.0 billion by the Authority and approximately \$1.5 billion by third-party or non-recourse funding sources for ongoing projects and for projects to be commenced during the five-year program period, for a total of approximately \$3.5 billion. The size of the FY17-FY21 Capital Program is a response to the growth in passengers at Logan Airport, which has

prompted the need to undertake projects sooner than anticipated in the Plan to facilitate the increase in demand. The financial plan to support the capital program includes, among other things, (i) additional bond issues (to fund \$415.6 million of project costs) in fiscal years 2019, 2020 and 2021, and (ii) a parking rate increase of \$3.00 per day effective July 1, 2016 and planned parking rate increases of \$3.00 per day in fiscal years 2018, 2020 and 2022 for all Logan Airport parking facilities.

Set forth in the following table is a summary of the Authority-funded portion of the FY17-FY21 Capital Program, including estimated funding sources and a summary of uses, showing capital projects by funding category. **The funding sources and uses set forth below reflect current expectations and are subject to change over the course of the current five-year planning period.** The Authority-funded portion of the FY17-FY21 Capital Program is funded from a variety of sources, including bond proceeds, grants, PFCs, Customer Facility Charges (“CFCs”) and pay-as-you-go capital. The Authority’s financing plan assumes the issuance of the Series 2017 Bonds to fund \$91.0 million of project costs (of which \$89.7 million will be expended during fiscal years 2017 through 2021, and \$1.3 million will be used to reimburse expenditures made prior to fiscal year 2017). These projects include renovations to Terminal B to accommodate airline consolidation and improve passenger flow by realigning security checkpoints, ticket counters and kiosks, renovations and enhancements to the Customs and Border Protection area within Terminal E to accommodate the increase in international passengers, the replacement of equipment in the Terminal E West electrical substation and interior renovations to the lower level connection between Terminals C and E. The table below does not reflect projects that have been or may be funded through other third-party or non-recourse funding sources. For information about the portion of the FY17-FY21 Capital Program (consisting of approximately \$1.5 billion in projects) anticipated to be funded through third-party or non-recourse funding sources, see “Third Party Funded Capital Projects” below.

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**FY17-FY21 CAPITAL PROGRAM**  
**SUMMARY OF ESTIMATED FUNDING SOURCES AND CAPITAL PROJECTS**  
**(Authority Funded Portion) <sup>1</sup>**  
**(\$ in thousands)**

<u>Funding Sources</u>	
Maintenance Reserve Fund	\$462,333
Improvement and Extension Fund	398,856
PFC - Pay Go	132,814
FAA, TSA and Other Grants	49,468
U.S. DOT FASTLANE grant	34,503
Prior Bond proceeds <sup>2</sup>	171,735
2017 Bond proceeds <sup>2</sup>	89,735
Future Bond proceeds <sup>2</sup>	459,322
Future Bonds Payable from PFC <sup>2</sup>	171,293
CFCs pay-as-you-go	1,613
Custodial Fund <sup>3</sup>	<u>75,810</u>
<b>Total Sources (Authority Funded)</b>	<b>\$2,047,480</b>
<u>Project Costs Funded with Revenue Bonds</u>	
Terminal E Modernization - Phase 1 <sup>5,7</sup>	\$369,906
Terminal E Renovations and Enhancements <sup>7</sup>	96,623
Terminal B Optimization <sup>4,5,7</sup>	119,497
HVAC Equipment Replacement Program <sup>7</sup>	13,231
Parking 1,000 Spaces	70,000
Terminal C Roadways	49,672
Central Heating Plant Upgrade <sup>7</sup>	15,966
Parking 4,000 Spaces <sup>7</sup>	44,000
Customs and Border Protection (Terminal E) <sup>4</sup>	5,000
Terminal E West Substation <sup>4</sup>	5,000
Other Projects <sup>4,6</sup>	<u>103,190</u>
	<b>\$892,084</b>
<u>Project Costs Funded with PFCs and Grants</u>	
CBIS Replacement/Optimization	\$17,960
Post Security Concourse from Terminal B Gates 37-38 to Food Court	24,997
Runway 9-27 Rehab	19,000
Taxiway C3 Pavement Rehab and New Bypass	7,500
Replace Runway 4R Approach Light Pier	5,000
Taxiway D, D1, MS Rehab	5,600
A380 Airfield Improvements	9,097
Resurface North Cargo Apron	7,000
Runway Incursion Mitigation Study	1,800
U.S. DOT FASTLANE Grant Projects	34,503
Other Projects	<u>84,328</u>
	<b>\$216,784</b>
<u>Other Project Costs Funded with Massport Internally Generated Funds</u>	
South Boston Waterfront Transportation Center	\$88,068
HVAC Equipment Replacement Program <sup>7</sup>	12,664
Terminal C Gates 40-42 Connector	40,000
Terminal B Optimization <sup>7</sup>	20,470
Terminal E Modernization - Phase 1 <sup>7</sup>	18,370
Terminal C Canopy & Upper Deck	30,000
Central Heating Plant Upgrade <sup>7</sup>	16,000
U.S. DOT FASTLANE Grant Projects	46,827
Other Projects	<u>588,790</u>
	<b>\$861,189</b>
<u>Project Costs Funded with Customer Facility Charges</u>	1,613
<u>Project Costs Funded from Custodial Funds <sup>3</sup></u>	75,810
<b>Total Capital Projects (Authority Funded)</b>	<b>\$2,047,480</b>

<sup>1</sup> Reflects only that portion of the FY17-FY21 Capital Program expected to be financed by the Authority. Does not include approximately \$1.5 billion of projects expected to be funded through third-party or non-recourse funding sources. See "CAPITAL PROGRAM – Third Party Funded Capital Projects" herein for more information on third party projects included in the FY17-FY21 Capital Program.

<sup>2</sup> Proceeds amount shown here does not include bond reserves, costs of issuance or capitalized interest beyond the fiscal years 2017 through 2021 time period.

<sup>3</sup> Includes funds held by the Authority for harbor dredging as well as the Terminal A Maintenance Reserve Fund.

<sup>4</sup> Expected to be funded in whole or in part with proceeds of the 2017 Bonds. The 2017 Bonds will also fund \$1.3 million of costs incurred prior to fiscal year 2017.

<sup>5</sup> A portion of this project expected to be financed with proceeds of bonds payable from PFCs (\$129.3 million of Terminal E Modernization Phase 1 and \$42.0 million of Terminal B Optimization).

<sup>6</sup> Includes a variety of projects financed with proceeds of prior Bonds.

<sup>7</sup> Projects with multiple financing sources.

## Authority Funded Capital Projects

**Logan Airport Improvements.** The FY17-FY21 Capital Program includes funding for all or a portion of the following improvements at Logan Airport:<sup>1</sup>

*Improvements to Accommodate Airline Consolidation and Domestic Travel Growth at Logan.* To address and resolve operational issues and accommodate the merger of American and US Airways, the Authority is redesigning the space inside Terminal B at a total expected cost of \$165.0 million, expected to be funded with a combination of (i) Bond proceeds (\$102.5 million, of which \$25.0 million was previously financed with proceeds of the Series 2016-B Bonds), (ii) PFCs or bonds payable from PFCs (see “Funding Sources – Passenger Facility Charges” below) (\$42.0 million) and (iii) Authority funds (\$20.5 million). While this project is an important component of the Airport’s long term planning goal to have all terminal gates connected post security, the primary focus of the project will be to optimize the Terminal B space, thereby facilitating American’s consolidation of its operations in Pier B and aircraft operations from contiguous gates. The scope for both the arrival and departure levels will entail apron modifications to accommodate widebody aircraft, checkpoint enhancements, reconfiguration of ticketing, build-out of concession space, build-out of new space, holdroom and public spaces modifications.

The FY17-FY21 Capital Program also includes two projects designed to improve post-security passenger connectivity at the airport. The first project consists of the construction of a secure-side link to connection Terminal B gates 37-38 to the food court (\$25.0 million), which will allow for the closure of the separate checkpoint currently serving only Spirit Airlines. In accordance with the Strategic Plan, this will complete the post security passenger connectivity of all gates in Terminal B. The FY17-21 Capital Program also includes the Gates 40-42 Connector project in Terminal C (\$40.0 million), which involves the construction of a post-security connector from the main part of Terminal C to Gates 40, 41 and 42, to more seamlessly link the terminals post-security and allow greater connectivity between the terminals, with greater adaptability to changes in the airline industry.

Finally, the FY17-FY21 Capital Program includes a number of projects designed to address roadway congestion that has resulted from increased passenger traffic. These include updates to the Terminal C Roadways (\$50.0 million) and Terminal C Canopy and Upper Deck (\$30.0 million). The goal of the Terminal C Roadway project is to improve traffic conditions for vehicles entering Terminal C and exiting Terminal B through improved curb assignments, reconfigurations for the arrivals roadway and construction of a new departures roadway. The Terminal C Canopy and Upper Deck project will replace the existing departures level canopy and provide more curbside space for passengers.

*Improvements to Facilitate the Growth of International Traffic at Logan.* The Authority is undertaking a number of projects to support the increase in international traffic. The first of these projects consists of renovations and enhancements to the airfield (\$10.0 million) and Terminal E (\$167.0 million) to accommodate the Group VI aircraft (A380 and 747-800) with two-level airport boarding jet bridges. The renovations and enhancements to Terminal E were funded primarily with proceeds of the Series 2016-B Bonds, and the project commenced in fiscal year 2016. The project was substantially completed in Spring 2017, with full completion expected by October 2017.

The second, and larger, project is a major Terminal E modernization project that is expected to add seven gates to Terminal E in two phases. The Terminal E modernization project will also include the addition of ticket counters, increases in customs and border protection facilities, additional baggage carousels and passenger amenities. The first phase, Terminal E Modernization – Phase 1, is included in the FY17-FY21 Capital Program and will add four new gates. These additional gates are expected to improve apron operating efficiencies and decrease Terminal E delays. The second phase, Terminal E Modernization – Phase 2, which will add the remaining three gates, will be incorporated in future capital programs. The FY17-FY21 Capital Program includes \$390.0 million for Phase I of the Terminal E modernization project. The total cost of the Terminal E modernization project is currently expected to be \$720.0 million, with the remaining \$330.0 million expected to be incorporated in future capital programs.

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<sup>1</sup> Total project costs reflected in this section may differ slightly from the summary table on the prior page to the extent such projects have multiple funding sources and/or involve spending that has occurred either prior to fiscal year 2017 or that will occur after fiscal year 2021 (and thus falls outside the current capital planning period).

*Improvements to Ground Transportation to Logan.* The Authority is undertaking a rebuild of Silver Line Buses placed into service over ten years ago (\$6.5 million) and on-airport shuttle buses (\$4.3 million).

*Improvements to Facilitate Airport Parking.* Logan reaches its parking capacity on numerous occasions throughout the calendar year. In an effort to alleviate this parking demand, as has been the case with prior capital programs, the Authority has included parking projects in the FY17-FY21 Capital Program. With an ultimate goal of constructing 5,000 new parking spaces at the Airport (at a total expected cost of \$250.0 million), the FY17-FY21 Capital Program includes \$70.0 million to construct 1,000 parking spaces and \$44.0 million to construct a portion of the remaining 4,000 new spaces. These projects are contingent on the lifting of the SIP Parking Limitation. See “AIRPORT PROPERTIES – Airport Facilities – Parking Facilities.”

*Checked Baggage Inspection System (“CBIS”) Replacement and Optimization.* This project, which completed construction and is in service as of June 2016, reflects the Authority’s commitment to remain a leader in airport security and included \$216.0 million to improve the existing hold baggage screening system originally installed in 2002. The TSA provided the new screening equipment, and the construction improvements included realigning bag belts, new check baggage resolution areas and a centralized viewing room for on-screen resolution. Programmed spending related to this project in fiscal year 2017 is \$18.0 million, which reflects administrative expenses.

*Other Airport Projects.* The remainder of the FY17-FY21 Capital Program relating to the Airport includes a variety of airside and landside projects including the following projects and their estimated costs for fiscal years 2017 through 2021: (i) HVAC equipment replacement program (\$25.9 million) and (ii) central heating plant upgrade (\$32.0 million). Approximately \$110.8 million of Logan airfield projects are expected to be funded with grants and PFCs including but not limited to runway 4R approach light pier (\$5.0 million), runway incursion mitigation study (\$1.8 million), north apron re-surfacing (\$7.0 million), runway 9-27 rehabilitation (\$19.0 million) and various taxiway rehabilitations (\$13.1 million).

**Worcester Airport and Hanscom Field Improvements.** As part of the Authority’s commitment to developing air service for the citizens of central Massachusetts, from fiscal year 2017 through fiscal year 2021, the Authority expects to spend \$85.6 million on improvements at Worcester Regional Airport, including \$32.0 million on installation of a Category III ILS and related taxiway improvements. The Category III ILS will dramatically improve reliability for commercial flight operations in low visibility conditions. In addition, the Authority expects to spend \$12.0 million on building a new ARFF station and CBP facility at Hanscom Field.

**Maritime Improvements.** As part of its strategic planning efforts, the Authority continues to prepare Conley Terminal for the newly consolidated shipping lines and the arrival at the Port of larger ships that is expected to occur now that the expanded locks on the Panama Canal have opened. The FY17-FY21 Capital Program includes \$55.0 million for Boston Harbor dredging, a component of the Deep Draft Project, \$18.9 million for the construction of the dedicated freight corridor and enabling projects, \$19.4 million relating to the construction of Berth 10 and the purchase and installation of three new cranes and \$81.3 million for the Conley Terminal infrastructure repairs, equipment upgrades and Berth 11 dredging. See “PORT PROPERTIES – Maritime Properties – Conley Terminal” for a further discussion of the total cost and expected funding sources for the various improvements at Conley Terminal.

**Real Estate Improvements.** The Authority is proceeding with the construction of an approximately 1,550-space South Boston Waterfront Transportation Center, on a parcel near the BCEC that would provide parking for other Massport developments in South Boston. This facility will provide all of the parking required by the Summer Street Hotel (see “Third Party Funded Capital Projects – Parcel D-2 Development/Summer Street Hotel” below) and will fill the need for additional area parking and create a user experience that is integrated into the transportation fabric of the South Boston waterfront district. The multi-level, multi-modal transportation center will be built over, and supported by, the I-90 tunnel structure built as part of the Central Artery & Tunnel Project (CA/T). The approximately \$90.0 million facility is being funded with Authority funds.



### Third Party Funded Capital Projects

**Other Third Party Development Ventures.** As described above, the Authority expects that approximately \$1.5 billion of the total FY17-FY21 Capital Program will be financed by third party funds (*i.e.* funds that are not on the Authority’s balance sheet). Projects include plans to construct and finance an apartment building and hotel with a below-grade parking structure on Parcel K (\$320.0 million), a hotel on Summer Street (\$550.0 million) (as further described below), Phase II of the Waterside Place apartment development (\$130.0 million), Roseland’s second apartment complex in East Boston (\$113.0 million), and Terminal Improvements by JetBlue at Terminal C (\$100.0 million).

**Parcel D-2 Development/Summer Street Hotel.** The Authority continues to proceed with the development of an approximately 1,050-room luxury hotel located on Parcel D-2, which parcel is owned by the Authority and located on Summer Street opposite the BCEC. After issuing an Amended and Restated RFQ and RFP for the development of Parcel D-2 (also known as the Summer Street Hotel project), the Authority received six proposals in April 2016 and selected a developer for this project in September 2016. The Authority is currently completing a development agreement with the selected developer, a joint venture of New Boston Hospitality (The Davis Companies) and Omni Hotels and Resorts. The Authority expects that the Summer Street Hotel project will be developed using approximately \$550.0 million of private investment. It is currently expected that construction will commence in 2018, with project completion in 2021.

### Funding Sources

The various projects listed in the FY17-FY21 Capital Program have been and will be financed: (i) through the issuance of Bonds, commercial paper and/or debt payable solely from PFCs, (ii) from the application of PFCs, federal grants, CFCs and private capital and (iii) from cash flow from operations. The Authority’s commercial paper program provides interim funding for certain projects. See “MANAGEMENT’S DISCUSSION OF FORECAST ASSUMPTIONS – Debt Service and Coverage.” As of March 31, 2017, the Authority had the following approximate amounts available for projects included in FY17-FY21 Capital Program: \$311.6 million of cash from operations, \$96.6 million of Bond and commercial paper proceeds, \$27.7 million of pay-as-you-go PFCs and \$32.5 million of CFCs.

**2017 Bond Proceeds.** The proceeds of the 2017 Bonds are expected to be used by the Authority to fund improvements at the Airport as shown in the table and as described below:

	(\$ in thousands)
<b>2017 BONDS (AMT)</b>	
Terminal B Optimization	\$77,500
Terminal E West Substation	5,000
Customs and Border Protection Improvements (Terminal E)	5,000
Terminal C to E Lower Level Interior Renovations	<u>3,500</u>
<b>Total 2017 Bond Proceeds</b>	<b>\$91,000</b>

The amounts set forth in the foregoing table may be reallocated by the Authority in accordance with the 1978 Trust Agreement and the Bond Resolution.

**Future Bond Proceeds.** The FY17-FY21 Capital Program is based on the assumption that the Authority will issue three additional series of Bonds in fiscal years 2019 through 2021 to finance project expenditures in the amounts set forth below:

	Expected Project Expenditures from <u>Proceeds</u>
Fiscal Year 2019 (“2018 Bonds”)	\$196.9 million
Fiscal Year 2020 (“2019 Bonds”)	125.0 million
Fiscal Year 2021 (“2020 Bonds”)	<u>93.7 million</u>
TOTAL:	\$415.6 million

It is expected that \$415.3 million of the proceeds of the 2018 Bonds, the 2019 Bonds and the 2020 Bonds will be spent during FY17-FY21.

**Passenger Facility Charges.** Since 1993, the Authority has received FAA approval to impose and use PFCs, which have been at the \$4.50 level since October 1, 2005. Currently, the Authority’s PFC impose and use authority is \$1.67 billion. The Authority plans to submit its eleventh PFC application to the FAA during calendar year 2017 to impose and use approximately an additional \$131.9 million in PFCs. In accordance with the 1978 Trust Agreement, the proceeds of PFCs have been excluded from the Revenues securing the Bonds. In the event that PFC revenues and other funding sources are inadequate to meet anticipated project costs, the Authority would look for other funding sources or defer or cancel projects.

At various times since 1999, the Authority has issued PFC Revenue Bonds on a “standalone basis” under the terms of a separate trust agreement, which are secured only by PFC revenues, to finance certain eligible projects. It is currently expected that no PFC Revenue Bonds will remain outstanding after July 1, 2017. See “OTHER OBLIGATIONS – PFC Revenue Bonds.” The Authority expects to continue to leverage its PFC revenue stream after July 1, 2017 and is currently studying alternatives for accomplishing this objective in the most efficient and effective way. The FY17-FY21 Capital Program assumes that, in addition to the 2018 Bonds, 2019 Bonds and 2020 Bonds listed above, the Authority will issue additional debt (consisting of Bonds, PFC Revenue Bonds, or a combination thereof) that would be paid from PFC revenues (“*PFC Debt*”) to finance \$171.3 million in project expenditures. Proceeds from this PFC Debt are expected to be used to finance (i) a portion of the Terminal B renovations (\$42.0 million) and (ii) a portion of Phase 1 of the Terminal E modernization project (\$129.3 million). The issuance of such PFC Debt, which is expected to occur in the latter years of the FY17-FY22 Capital Program, is subject to the receipt of FAA approval for PFC funding for these projects. If these projects are not approved for PFC funding, or if the approval amount is less than the Authority’s PFC funding request, the Authority would likely fund the difference as part of a future Bond issue under the 1978 Trust Agreement.

The PFC Debt may be issued under the terms of the separate trust agreement described under the heading “OTHER OBLIGATIONS – PFC Revenue Bonds” or may be partially or wholly issued under the terms of the 1978 Trust Agreement. See “SECURITY FOR THE 2017 BONDS – Modifications to the 1978 Trust Agreement” in the Official Statement.

**Customer Facility Charges.** In December 2008, the Authority imposed a \$4.00 CFC for each transaction day that a car is rented at Logan. Effective December 2009, the CFC was increased to \$6.00 per transaction day. The CFC provides security for a special facility financing under the CFC Trust Agreement (as defined herein). Effective upon the adoption of the CFC Trust Agreement, the CFCs were excluded from Revenues securing the Bonds and pledged as security under the CFC Trust Agreement. See “OTHER OBLIGATIONS – CFC Revenue Bonds.”

**Federal Grants.** The Authority receives grants annually from the FAA pursuant to the Airport Improvement Program (“*AIP*”) and also receives TSA grants from time to time. These grants generally fall into two categories: (i) entitlement grants, which are awarded based upon the number of passengers enplaned at the Airport, and (ii) discretionary grants, which are awarded at the discretion of the FAA based upon specified criteria, including a cost-benefit analysis. Similar to many federal grant-in-aid programs, AIP grants are reimbursement grants. Accordingly, the Authority must expend its own cash to fund an authorized project and then submit invoices to the FAA for reimbursement of such costs pursuant to the terms of the grant. Thus, while grants may be awarded in one fiscal year, grant funds may be received over a period of several subsequent fiscal years. For a description of the

AIP program, see “AVIATION INDUSTRY CONSIDERATIONS – Considerations Regarding Other Sources of Revenue – Federal Grants-in-Aid.”

The Authority will continue its practice of fully utilizing the AIP entitlement grants that are awarded to it to maintain and improve Logan Airport, Hanscom Field and Worcester Regional Airport, and of aggressively seeking FAA discretionary grants for AIP eligible projects. Based on communications with the FAA, the Authority currently expects \$5.0 million in annual AIP entitlement grants for Logan, as well as \$1.0 million in annual AIP entitlement grants for Hanscom Field and \$1.0 million for Worcester Regional Airport. For fiscal year 2012 through fiscal year 2017, the Authority collected \$48.1 million in FAA discretionary grants for the construction of the Runway Safety End for Runway 33L; the grant was closed in August 2016.

Major projects previously funded in part with TSA grant funds include \$87.0 million to fund a portion of the cost of the infrastructure improvements at the Logan Airport terminals to accommodate the Airport’s current hold baggage screening system (which is being replaced by the CBIS), and \$4.2 million for the installation of Closed Circuit Television Cameras. In fiscal years 2011 through 2015, the Authority entered into Other Transaction Agreements (“OTAs”) with the TSA for a total of \$120.9 million for the CBIS; through March 31, 2017, the Authority has collected \$108.9 million for this project.

The Authority was awarded a \$42.0 million FASTLANE grant by the federal government to pay for a portion of the \$102.9 million project costs associated with improving Conley’s ability to accommodate increased activity. See “PORT PROPERTIES – Maritime Properties – Conley Terminal.”

There can be no assurance that additional grants from the FAA or the TSA will be available in the future. See “AVIATION INDUSTRY CONSIDERATIONS – Considerations Regarding Other Sources of Revenue – FAA Reauthorization and Level of Federal Airport Grant Funding.”

**Other Funding Sources.** The FY17-FY21 Capital Program has been developed to be achievable within the resources anticipated to be available to the Authority at relevant times, including the capacity of users of the facilities of the Authority to bear additional charges. Moreover, the Authority is expending considerable efforts to assure that program costs are predictable and controlled. Should there occur any significant increases in the costs of projects included in the FY17-FY21 Capital Program, whether due to cost overruns or other financial obligations not now contemplated, or should anticipated resources (e.g., federal grant receipts, PFC collections and/or TSA grants) fail to materialize on schedule, resources available to the Authority may be inadequate to accomplish all objectives of the FY17-FY21 Capital Program. If so, the Authority would be required to utilize alternative funding sources such as the issuance of additional Bonds, or it may reduce or delay components of the FY17-FY21 Capital Program. In that event, the selection of projects to be reduced or delayed will depend on circumstances in existence at the time, including relative stages of development, relative economic importance to the activities of the Authority and degrees of transferability of project funding sources.

## **AUTHORITY REVENUES**

The Authority operates on a consolidated basis; all Revenues generated by each of the Authority’s Projects are pooled to pay the Authority’s Operating Expenses and are pledged to support all of the Bonds on a parity basis. Under federal law, the Authority is one of the few “grandfathered” consolidated port authorities permitted to apply revenues generated at an airport owned by the Authority to support other operations of the Authority. See “AVIATION INDUSTRY CONSIDERATIONS – Federal Grants-in-Aid.” The Authority generates Revenues from each of its Projects, as described below, and each of the Airport and the Port Properties has several lines of business that generate revenue streams.

### **Airport Properties Revenues**

Revenues to the Authority from Airport operations consist of landing fees, terminal building rents and fees, cargo building rents, payments made by automobile rental companies, parking fees, concessions and other payments, including Revenues generated by operations at Hanscom Field and Worcester Regional Airport.

Consistent with federal law, aeronautical fees for use of Logan Airport, including landing fees and terminal building charges, are established on a “compensatory basis,” that is, set at levels calculated to compensate the Authority for the actual direct and indirect costs of providing those services and facilities to aeronautical users, principally the airlines. (However, terminal concession leases generally provide that rentals are established based upon a percentage of revenues generated, with a minimum annual guarantee, rather than pursuant to a compensatory method.) Such costs include the direct cost of such facilities, including terminals, runways and aprons, and the allocable portion of indirect costs of capital improvements serving the entire Airport, such as Airport roadways. The Authority has no agreements that require it to obtain “majority-in-interest” approvals from airlines for its operating or capital expenditures. Pursuant to federal law, landing fees and other aeronautical charges must be reasonable. The Authority believes that its rate-setting methodology is reasonable and consistent with federal law. However, there can be no assurance that such methodology will not be challenged and, if a judgment is rendered against the Authority, there can be no assurance that rates and charges paid by aeronautical users of the Airport will not be reduced. For a discussion of the federal laws and regulations affecting the Authority’s Airport rates and charges, see “AVIATION INDUSTRY CONSIDERATIONS – Federal Law Affecting Airport Rates and Charges.”

The Authority establishes landing fee rates for use of Logan’s airfield at levels calculated to recover the direct and indirect costs of providing common use landing field facilities and related services, based on projected aircraft landed weights for each year. Any variance from these projections is calculated after the fiscal year ends, and the adjustment is either paid to or invoiced to the air carriers and other users, although the Authority may adjust the landing fee during the fiscal year in order to reduce any variance that would be due.

Each fiscal year, the Authority also establishes terminal building rental rates and fees for aeronautical tenants of all of the Terminals, also on a compensatory basis. See “AIRPORT PROPERTIES – Airport Facilities – Lease Arrangements for Terminal Facilities.” Similar to the manner in which the landing fee is handled (as described above), any variance from projected costs is calculated after the fiscal year ends, and the adjustment is either paid to or invoiced to the air carriers, although the Authority may adjust the terminal rental rates during the fiscal year in order to reduce any variance that would be due.

Other Authority Revenues generated at the Airport include parking fees, which are generated according to parking rates set by the Authority, rents and other amounts paid by concessionaires, rental car companies and cargo facility operations, which are set by negotiation or bid.

The FAA has approved Authority applications to impose and use a \$4.50 PFC as authorized by federal legislation through October 1, 2024. The revenues from PFCs are dedicated to certain FAA-authorized capital projects and are excluded from the Revenues pledged under the 1978 Trust Agreement that secure the Bonds. See “CAPITAL PROGRAM – Funding Sources – Passenger Facility Charges.” The Authority also requires CFCs to be paid by rental car customers at Logan. The current CFC of \$6.00 per day is collected by the rental car companies and remitted to the trustee for the CFC Revenue Bonds as security therefor. CFC revenues are excluded from Revenues pledged under the 1978 Trust Agreement securing the Bonds. See “OTHER OBLIGATIONS – CFC Revenue Bonds.”

### **Port Properties Revenues**

Revenues from the Port Properties are derived from several different sources, reflecting the diverse business activities at the Authority’s maritime terminals. At Moran Terminal, Medford Street Terminal and Mystic Pier No. 1, which are leased to Boston Autoport, the tenant pays a fixed rent, plus a percentage of sublease revenues. At Conley Terminal, which is operated by the Authority, the Authority collects fees from shipping lines for loading and unloading containers and for related services. The Authority also collects dockage and wharfage fees from the vessels. At Cruiseport Boston, the Authority charges per passenger use fees, as well as dockage, water and other charges such as equipment rental.

The Authority also collects dockage and tonnage fees for bulk cargo (most particularly, cement products), ground lease rentals, and building rentals at the various associated office and warehouse buildings included in the Port Properties. Finally, the Authority realizes revenues from the building or facility rental or ground rental of the various properties it owns in East Boston, South Boston and Charlestown.

## Investment Income

The Authority also derives income from the investment of the balances in the Operating Fund, the Maintenance Reserve Fund, the Improvement and Extension Fund, the Capital Budget Fund or Account, and the Reserve and Bond Service Accounts in the Interest and Sinking Fund. See “GENERAL OPERATIONAL FACTORS – Investment Policy.”

## SELECTED FINANCIAL DATA

The table on page A-43 reflects historical Operating Results and Debt Service Coverage for the five most recent fiscal years and the nine-month periods ending March 31, 2016 and 2017, and has been prepared in accordance with accounting principles required by the 1978 Trust Agreement, which differ in some respects from generally accepted accounting principles (“GAAP”). Information for each of the five fiscal years is derived from the Authority’s financial statements for the respective fiscal years. Financial statements of the Authority for fiscal year 2016 and comparative data for fiscal year 2015, together with the report thereon of Ernst & Young LLP, independent accountants, are included in APPENDIX B to the Official Statement. Information for the nine-month periods ending March 31, 2016 and 2017 under the caption “Historical Operating Results and Debt Service Coverage” is derived from the unaudited financial records of the Authority.

The table on page A-44 reflects forecasted Operating Results and Debt Service Coverage for fiscal year 2017 through fiscal year 2021 and was prepared in accordance with accounting principles required by the 1978 Trust Agreement. The prospective financial information included in this APPENDIX A has been prepared by and is the responsibility of the Authority’s management. The Authority and its management believe that the prospective financial information included in this APPENDIX A and appearing on page A-44 has been prepared on a reasonable basis, reflecting its best estimates and judgments, and represent, to the best of management’s knowledge and opinion, the Authority’s expected course of action. However, because this information is a forecast, it should not be relied on as necessarily indicative of future results. The prospective financial information was prepared by the Authority in accordance with accounting principles required by the 1978 Trust Agreement in order to show forecasted debt service coverage; such information was not prepared with a view toward compliance with the guidelines established by the American Institute of Certified Public Accountants for preparation and presentation of prospective financial information.

Neither Ernst & Young LLP nor any other independent accountant has examined, compiled, reviewed, audited or performed any procedures with respect to the “Forecasted Operating Results and Debt Service Coverage” appearing on page A-44 or the Review of Airport Properties Net Revenues Forecasts included in APPENDIX D to the Official Statement, and, accordingly, Ernst & Young LLP does not express an opinion or any other form of assurance on such information or its achievability. Neither Ernst & Young LLP, nor any other independent accountant, assumes any responsibility for or has any association with the prospective financial information and any other information derived therefrom included elsewhere in this offering document.

The Ernst & Young LLP report included in APPENDIX B to the Official Statement relates to the Authority’s historical financial information. The Ernst & Young LLP report does not cover any other information in this offering and should not be read to do so.

The following tables show the calculation of Annual Debt Service Coverage of the Authority, as provided under the 1978 Trust Agreement, which equals the ratio of the Net Revenues of the Authority to the Annual Debt Service for such year. “Net Revenues” is defined in the 1978 Trust Agreement as the excess of Revenues over Operating Expenses. For the purpose of the calculations, proceeds of PFCs and CFCs have been excluded from Revenues because such proceeds have been excluded from Revenues under the 1978 Trust Agreement. In addition, Revenues do not include a portion of the Terminal A rental revenues collected by the Authority from air carriers, which amounts have been pledged to pay debt service on the special facilities revenue bonds relating to certain Terminal A improvements (the “Terminal A Bonds”). See “OTHER OBLIGATIONS – Special Facilities Revenue Bonds.” As used in the tables, “Annual Debt Service” is equal to the “Principal and Interest Requirements” on Bonds outstanding for the applicable fiscal year, less the capitalized interest paid from the applicable Project Fund. See APPENDIX E to the Official Statement – Summary of Certain Provisions of the 1978 Trust Agreement – “Certain Definitions.” The calculation of Revenues, Operating Expenses and Annual Debt Service under the caption

“Forecasted Operating Results and Debt Service Coverage” is based upon certain assumptions described below. See “MANAGEMENT’S DISCUSSION OF FORECAST ASSUMPTIONS.” While the Authority believes that the assumptions made are reasonable, it makes no representation that the conditions assumed will in fact occur. To the extent that actual future conditions differ from those assumed or from the information on which the assumptions are based, the actual operating results will vary from those forecast, and such variations may be material.

Note 2 to the Financial Statements in APPENDIX B to the Official Statement includes a reconciliation between the increase in Net Assets as calculated under GAAP and Net Revenues as calculated under accounting practices prescribed by the 1978 Trust Agreement. The significant differences between the two methods of accounting are as follows: investment income is included as operating revenue under the 1978 Trust Agreement, not under GAAP; and depreciation expense, interest expense, payments in lieu of taxes, PFC, CFC and capital grant income are all recorded under GAAP, but not under the 1978 Trust Agreement. See APPENDIX B to the Official Statement.

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**HISTORICAL OPERATING RESULTS AND DEBT SERVICE COVERAGE  
UNDER THE 1978 TRUST AGREEMENT**  
(Fiscal Year Ended June 30, except as noted)  
(\$ in thousands)

	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>03/31/2016</u>	<u>03/31/2017</u>
<b>1978 Trust Agreement</b>						<b>Nine Months Ended</b>	<b>Nine Months Ended</b>
<b>Revenues:</b>							
Airport Properties - Logan							
Landing Fees	\$ 88,287	\$ 86,533	\$ 92,896	\$ 101,123	\$ 104,489	\$ 76,252	\$ 83,083
Parking Fees	125,771	131,873	136,307	148,653	154,068	112,598	123,877
Utility Fees	15,275	14,867	16,798	18,274	17,960	13,922	11,878
Terminal Rentals (1)	115,567	117,891	129,487	133,897	142,176	104,798	120,449
Non-Terminal Building and Ground Rents	40,107	42,086	46,175	45,756	49,317	36,168	36,722
Concessions	71,342	70,082	76,003	81,270	86,645	63,678	74,667
Other	20,467	19,162	24,895	29,452	32,061	23,479	23,638
	<u>476,816</u>	<u>482,494</u>	<u>522,561</u>	<u>558,425</u>	<u>586,716</u>	<u>430,895</u>	<u>474,314</u>
Airport Properties - Hanscom	9,984	10,377	10,640	12,066	12,195	9,096	9,399
Airport Properties - Worcester	1,238	774	1,538	1,624	1,572	1,200	1,188
Total Airport Properties	<u>488,038</u>	<u>493,645</u>	<u>534,739</u>	<u>572,115</u>	<u>600,483</u>	<u>441,191</u>	<u>484,901</u>
Port Properties							
Maritime Operations (2)	54,556	56,334	62,068	68,316	74,259	56,683	60,447
Maritime Business Development/Real Estate	18,778	20,295	23,653	22,295	24,619	17,782	25,523
	<u>73,334</u>	<u>76,629</u>	<u>85,721</u>	<u>90,611</u>	<u>98,878</u>	<u>74,465</u>	<u>85,970</u>
Total Operating Revenue	<u>561,372</u>	<u>570,274</u>	<u>620,460</u>	<u>662,726</u>	<u>699,361</u>	<u>515,656</u>	<u>570,871</u>
Investment Income (3)	<u>6,695</u>	<u>4,168</u>	<u>3,208</u>	<u>3,830</u>	<u>5,689</u>	<u>3,921</u>	<u>5,559</u>
Total Revenues	<u>568,067</u>	<u>574,442</u>	<u>623,668</u>	<u>666,556</u>	<u>705,050</u>	<u>519,577</u>	<u>576,430</u>
<b>Operating Expenses (4):</b>							
Airport Properties							
Logan	251,718	267,157	290,641	307,368	307,394	227,738	243,723
Hanscom	8,162	9,235	10,396	10,043	12,152	8,989	9,284
Worcester	5,048	5,012	7,497	9,026	9,408	7,253	7,123
	<u>264,928</u>	<u>281,404</u>	<u>308,534</u>	<u>326,437</u>	<u>328,954</u>	<u>243,980</u>	<u>260,130</u>
Port Properties							
Maritime Operations (2)	55,798	56,740	59,860	62,020	66,307	49,641	50,468
Maritime Business Development/Real Estate	13,242	13,854	15,166	20,012	16,725	12,274	13,469
	<u>69,040</u>	<u>70,594</u>	<u>75,026</u>	<u>82,032</u>	<u>83,032</u>	<u>61,915</u>	<u>63,937</u>
Total Operating Expenses	<u>333,968</u>	<u>351,998</u>	<u>383,560</u>	<u>408,469</u>	<u>411,986</u>	<u>305,895</u>	<u>324,067</u>
<b>Net Revenues</b>	<u>\$234,099</u>	<u>\$222,444</u>	<u>\$240,108</u>	<u>\$ 258,087</u>	<u>\$ 293,064</u>	<u>\$ 213,682</u>	<u>\$ 252,363</u>
<b>Annual Debt Service</b>	\$105,836	\$ 90,084	90,563	98,500	98,220	N/A	N/A
<b>Annual Debt Service Coverage</b>	2.21	2.47	2.65	2.62	2.98	N/A	N/A

(1) Excludes the portion of Terminal A rental revenue that is pledged to pay debt service on certain special facilities revenue bonds relating to certain Terminal A improvements. See "OTHER OBLIGATIONS - Special Facilities Revenue Bonds."

(2) Maritime Operations include Auto, Container, Cruise and Seafood Business lines.

(3) Excludes investment income earned by and deposited into Construction, PFC and CFC Funds.

(4) Includes allocation of all operating expenses related to Authority General Administration.

**FORECASTED OPERATING RESULTS AND DEBT SERVICE COVERAGE  
UNDER THE 1978 TRUST AGREEMENT**  
(Fiscal Year Ended June 30, except as noted)  
(\$ in thousands)

The forecasts presented in this table were prepared by the Authority on the basis of assumptions believed by it to be reasonable. See “MANAGEMENT’S DISCUSSION OF FORECAST ASSUMPTIONS” in this APPENDIX A. Inevitably, some of the assumptions used to develop the forecasts will not be realized, and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and these differences may be material.

	2017 <sup>(1)</sup>	2018	2019	2020	2021
<b>1978 Trust Agreement Revenues:</b>					
Airport Properties - Logan					
Landing Fees	\$110,225	\$119,065	\$124,194	\$129,632	\$133,617
Parking Fees	165,786	176,065	179,377	189,255	191,094
Utility Fees	16,438	17,769	18,124	18,487	18,856
Terminal Rentals <sup>(2)</sup>	158,026	180,609	185,460	194,843	200,751
Non-Terminal Building and Ground Rents	49,051	50,099	50,976	51,742	52,525
Concessions	94,289	88,069	90,127	91,369	92,636
Other	<u>32,283</u>	<u>29,693</u>	<u>30,429</u>	<u>30,644</u>	<u>30,846</u>
	\$626,099	\$661,368	\$678,688	\$705,972	\$720,324
Airport Properties - Hanscom	12,515	11,865	12,139	12,248	12,358
Airport Properties - Worcester	<u>1,613</u>	<u>1,741</u>	<u>1,778</u>	<u>1,821</u>	<u>1,864</u>
	\$640,227	\$674,974	\$692,606	\$720,040	\$734,546
Port Properties					
Maritime Operations	\$78,760	\$78,269	\$79,735	\$83,549	\$87,251
Real Estate	<u>31,789</u>	<u>24,704</u>	<u>23,549</u>	<u>25,886</u>	<u>26,602</u>
	\$110,549	\$102,973	\$103,285	\$109,435	\$113,853
Total Operating Revenue	\$750,776	\$777,947	\$795,890	\$829,475	\$848,399
Investment Income <sup>(3)</sup>	<u>6,696</u>	<u>5,053</u>	<u>5,379</u>	<u>5,426</u>	<u>6,248</u>
Total Revenues	\$757,472	\$783,000	\$801,269	\$834,902	\$854,647
<b>Operating Expenses: <sup>(4)</sup></b>					
Airport Properties					
Logan	\$333,177	\$355,842	\$373,108	\$391,651	\$410,078
Hanscom	12,329	13,610	14,114	14,798	15,496
Worcester	<u>9,318</u>	<u>10,638</u>	<u>13,371</u>	<u>13,923</u>	<u>14,483</u>
	\$354,823	\$380,090	\$400,592	\$420,371	\$440,058
Port Properties					
Maritime Operations	\$68,125	\$70,593	\$74,438	\$78,103	\$81,885
Real Estate	<u>18,226</u>	<u>19,824</u>	<u>19,881</u>	<u>20,790</u>	<u>21,720</u>
	\$86,351	\$90,417	\$94,319	\$98,894	\$103,605
Total Operating Expenses	\$441,174	\$470,507	\$494,911	\$519,265	\$543,663
<b>Net Revenues</b>	\$316,298	\$312,493	\$306,358	\$315,637	\$310,984
Annual Debt Service <sup>(5)</sup>	\$102,226	\$113,272	\$131,093	\$135,590	\$147,727
Annual Debt Service Coverage	3.09	2.76	2.34	2.33	2.11

(1) Reflects actual data for the nine months ended March 31, 2017, and budgeted data for the remaining three months.

(2) Excludes the portion of Terminal A rental revenue that is pledged to pay debt service on certain special facilities revenue bonds relating to certain Terminal A improvements. See “OTHER OBLIGATIONS – Special Facilities Revenue Bonds.”

(3) Excludes investment income earned by and deposited into Construction, PFC and CFC Funds.

(4) Includes allocation of all operating expenses related to Authority General Administration.

(5) Includes the 2017 Bonds and excludes the Bonds to be refunded with the proceeds of the 2017 Bonds. Assumes the Authority will issue (i) \$214.6 million par amount of revenue bonds in fiscal year 2019 at a 6% interest rate and no capitalized interest, (ii) \$136.3 million par amount of revenue bonds in fiscal year 2020 at a 6% interest rate and no capitalized interest, and (iii) \$102.2 million par amount of revenue bonds in fiscal year 2021 at a 6% interest rate and no capitalized interest. Excludes PFC Debt that may be issued during this period (see “CAPITAL PROGRAM – Funding Sources – Passenger Facility Charges”).



## MANAGEMENT'S DISCUSSION OF HISTORICAL OPERATING RESULTS

The Authority derives revenues from a wide variety of sources, including landing fees and terminal rentals, commercial parking fees, concession and rental car revenues, cargo tariffs and land rentals. Certain of these revenues are regulated by state or federal law, such as aeronautical revenues derived from landing fees and terminal rentals, PFCs and port tariffs. See "AUTHORITY REVENUES – Airport Properties Revenues" and "AVIATION INDUSTRY CONSIDERATIONS – Federal Law Affecting Rates and Charges" and "– Considerations Regarding Other Sources of Revenue." The Authority is not restricted by law with respect to establishing rates for certain other activities, such as commercial parking rates and rental rates for development properties, but the Authority is subject to general market conditions. Similarly, the Authority's operating expenses are governed, in part, by applicable law, which mandates certain standards applicable to large commercial service airports, such as Logan Airport, including safety and security staffing and capital requirements. For example, following September 11, 2001, the FAA and TSA instituted numerous security measures for all U.S. airports and seaports, including Logan Airport, Hanscom Field, Worcester Regional Airport and the Port of Boston, which increased the Authority's Operating Expenses. These measures include, but are not limited to, increasing the number of security and law enforcement personnel, restricting the parking of vehicles near terminals, prohibiting all unticketed persons beyond security checkpoints and enhancing the search and screening of all passengers and baggage.

Total Revenues according to 1978 Trust Agreement accounting in fiscal year 2016 were \$705.1 million, compared to \$666.6 million in fiscal year 2015, while Operating Expenses increased to \$412.0 million in fiscal year 2016 from \$408.5 million in fiscal year 2015 resulting in Net Revenues of \$293.1 million and \$258.1 million in fiscal years 2016 and 2015, respectively. Logan Airport is the primary source of the Authority's Revenues, Net Revenue and Operating Expenses. For a discussion of the differences between the accounting principles required by the 1978 Trust Agreement and GAAP, see Note 2 to the Financial Statements in APPENDIX B to the Official Statement. Revenues and Net Revenues do not include PFC revenues, which are required under federal law to be applied to certain FAA-authorized capital projects at the Airport and are not pledged for the benefit of holders of the Bonds, or CFC revenues, which are pledged as security for the CFC Revenue Bonds. See "OTHER OBLIGATIONS – CFC Revenue Bonds." Revenues and Net Revenues also do not include a portion of the Terminal A rental revenues collected by the Authority from air carriers, which amounts have been pledged to pay debt service on the Terminal A Bonds. See "OTHER OBLIGATIONS – Special Facilities Revenue Bonds." Operating revenue and expense figures for the Airport Properties and Port Properties do not include certain items, particularly expense items such as payments in lieu of taxes, interest and depreciation and amortization, properly allocable to such properties under GAAP.

The Authority actively manages both its revenues and expenses in order to balance several important goals, including the following: maintaining overall expenses at levels designed to maintain the Authority's standards for safety and security and customer service while maintaining reasonable rates for the users of its facilities, recovering a greater share of the actual costs of each of the Authority's Properties from the users of such Properties, maintaining the Authority's financial flexibility and ability to react to unforeseen events and balancing the mix of revenue sources to reduce reliance on any single source of revenues. Consistent with the profit and loss focus of the Authority's senior management, both of the operating departments, Aviation and Maritime, seek to recover an increasingly greater percentage of the actual operating costs and amortization allocable to each facility. Thus, for example, the Aviation Department has raised rents at and instituted a rates and charges policy for the use of Hanscom Field. The Maritime Department has increased tariffs for services provided to commercial shippers at the Port of Boston, while pursuing new revenue development through increasing uses of Port Properties and marketing programs to increase the volume of containers handled and the number of cruise passengers embarking and disembarking in Boston.

The Authority benchmarks certain key indices against its peers and establishes financial targets based upon such indices in order to evaluate its rates and maintain a competitive position in the various markets served by the Authority. The Authority strives to balance the need to maintain competitive rates with the need to provide a high level of service to its customers. Because the aeronautical rates and charges at Logan Airport are driven by actual costs, the Authority continually reviews and analyzes, and ultimately controls, its operating expenses. Thus, the Authority develops its five-year rolling capital program taking into account the annual capital and operating costs that will result from each project within the program. In an iterative process, the Authority develops a five-year rolling projected operating budget based upon the projected five-year capital program and benchmarks the projected

operating expenses resulting from the proposed projects in order to constrain the capital program in a manner that allows the Authority to meet its financial targets.

### **Airport Properties**

Airport Properties Net Revenues (Airport Properties Revenues less Airport Properties Operating Expenses), increased from fiscal year 2015 to fiscal year 2016 by 10.5%. The number of passengers using Logan Airport in fiscal year 2016 was 8.0% greater than in the prior fiscal year. Landed weights were 9.0% higher than the prior fiscal year. Parking exits were higher in fiscal year 2016 than in the prior fiscal year, and parking revenues were 3.6% greater than revenues from fiscal year 2015. Logan Airport generated approximately \$586.7 million of Revenues and incurred \$307.4 million of Operating Expenses in fiscal year 2016, compared to \$558.4 million of Revenues and \$307.4 million of Operating Expenses in fiscal year 2015. Operating revenue and expense figures for Logan Airport stated in this paragraph do not include certain items, particularly expense items, such as interest, depreciation and amortization, properly allocable to Logan Airport under GAAP.

Unlike many airport operators, the Authority is not constrained by contractual arrangements with the air carriers serving the Airport governing the incurrence of aeronautical costs and the recovery of such costs in the landing fee and terminal rentals. Instead, landing fees and terminal rentals are set annually by the Authority on a compensatory basis to cover direct and allocated capital, administrative, maintenance and operating costs. The Authority can also make adjustments during the year to the landing fee and to terminal rental rates, if necessary. Accordingly, each October, the Authority establishes the landing fee for the Airport per thousand pounds of landed weight and the rental rates for the terminals, based upon historic capital costs, projected landed weights and the budgeted direct and allocable indirect operating costs of providing these facilities for that fiscal year. The Authority consults with Logan Airport's airline users prior to rate-setting, but the Authority historically has not entered into use agreements or terminal leases which constrain the exercise of the Authority's rate-setting prerogatives. The Authority has no agreements that require it to obtain "majority-in-interest" approvals from airlines for its operating or capital expenditures.

**Landing Fees.** Landing fee revenues at the Airport increased from \$101.1 million in fiscal year 2015 to \$104.5 million in fiscal year 2016. During this period, the landing fee rate per thousand pounds of landed weight decreased from \$4.84 to \$4.39. Under current policy, any variance between the landing fees collected and the actual costs of operating the airfield during a fiscal year is calculated after the fiscal year ends, and the adjustment is either invoiced to (in the case of a shortfall) or paid to (in the case of a surplus) the air carriers and other aeronautical users. Landed weights at Logan Airport increased from approximately 20,784,046 thousand pounds in fiscal year 2015 to 22,652,895 thousand pounds in fiscal year 2016. A general shift to larger aircraft types as airlines upgraded their fleets and several new long-haul international services collectively contributed to the increase in landed weights.

Pursuant to the Authority's Peak Period Surcharge Regulation, the Authority monitors projected aviation activity at Logan Airport. If as a result of such monitoring, the Authority projects that the total number of aircraft operations scheduled for the Airport will exceed the total number of operations that can be accommodated without incurring unacceptable levels of delay under visual flight rule conditions, then the Authority will provide advance notice of such over-scheduling to the aircraft operators at the Airport. In the event that the aircraft operators at the Airport do not adjust their flight schedules, then the Authority may declare a "Peak Period" during the period of over-scheduling and impose a surcharge, currently set at \$150 for each operation during such Peak Period, subject to certain exemptions. Any surcharge amounts collected are credited to the airfield cost center. However, in accordance with applicable federal law, the Peak Period Surcharge Regulation is intended to be revenue neutral. Accordingly, the Peak Period Surcharge Regulation is not expected to have any material financial effect on the Authority's Revenues or Net Revenues. The Peak Period Surcharge Regulation was adopted in accordance with requirements of the Massachusetts Environmental Protection Act certificate and the FAA's Record of Decision regarding Runway 14/32, and the final decision in *Massport v. City of Boston, et al.* Based upon the current level of operations at the Airport, there is no Peak Period currently in effect. The Authority expects to continue to seek opportunities to maximize the utilization of existing capacity.

**Terminal Rentals.** Each fiscal year, the Authority establishes terminal building rental rates and fees for all of the Terminals on a compensatory basis. All leases with air carriers for terminal space at the Airport currently

provide that the Authority may revise rental rates periodically, at the discretion of the Authority, to recover the actual direct and indirect capital and operating costs for such leased space. The Authority resets these rates each fiscal year to recover its actual capital and budgeted operating costs. Similar to its policy regarding landing fees (described above), the Authority calculates the variance from the projections after the fiscal year ends, and the adjustment is invoiced to (in the case of a shortfall) or paid to (in the case of a surplus) the air carriers. The Authority's practice, however, is that the Authority does not recover through its terminal rentals the costs allocable to unrented space. The Authority can also make adjustments during the year to the rates charged to air carriers for terminal usage.

As described under "AIRPORT PROPERTIES – Airport Facilities – Lease Arrangements for Terminal Facilities," the Authority currently leases 84 of its 97 contact gates to various carriers serving the Airport. See the inside back cover of this Official Statement for a map of the Airport's terminal facilities. Rental revenue from Terminals (excluding the portion of Terminal A rental revenue pledged to pay debt service on the Terminal A Bonds) totaled \$133.9 million in fiscal year 2015 and \$142.2 million in fiscal year 2016. Rental income from non-terminal buildings and ground rents other than Terminals totaled \$45.8 million in fiscal year 2015 and \$49.3 million in fiscal year 2016.

**Parking Fees.** Airport parking revenues increased from \$148.7 million in fiscal year 2015 to \$154.1 million in fiscal year 2016. The parking revenue increase of 10.0% for the nine months ended March 31, 2017 compared to the nine months ended March 31, 2016 was due to a \$3.00 per day increase in parking rates commencing July 1, 2016. Additional rate increases of \$3.00 per day commencing July 1, 2017, July 1, 2019 and July 1, 2021 have been approved by the Board for all on-Airport parking lots, including the Economy Parking Garage. Parking fees are generated according to parking rates set by the Authority. The Authority does not share parking fees with the carriers as an offset to either landing fees or terminal rents; rather, the Authority retains the business risk and the return of this cost center. The number of commercial parking spaces at the Airport is subject to the SIP Parking Limitation. See "AIRPORT PROPERTIES – Airport Facilities – Parking Facilities."

**Concessions.** Revenues from concessions increased from \$81.3 million in fiscal year 2015 to \$86.7 million in fiscal year 2016, primarily due to higher passenger volume. Concession revenues include payments made by rental car companies that operate at the Airport and commissions from the following concessions: food and beverage, news and gifts, duty free shops and other specialty shops.

**Hanscom Field.** During fiscal year 2016, Revenues from operations at Hanscom Field represented approximately 1.7% of the total Revenues of the Authority, and Hanscom's Operating Expenses constituted approximately 2.9% of the Authority's Operating Expenses. In fiscal year 2016, Hanscom Field contributed \$12.2 million of Revenue, with Operating Expenses of \$12.2 million, yielding an operating surplus before debt service or other capital expenses of approximately \$43,000. In fiscal year 2015, Hanscom Field generated an operating surplus before debt service or other capital expenses of approximately \$2.1 million. The primary driver for the increase in operating expenses is the addition to staff for Airport Rescue and Fire Fighting to improve safety and emergency response at Hanscom Field. See "AIRPORT PROPERTIES – Hanscom Field."

**Worcester Regional Airport.** In fiscal year 2016, Revenues from operations at Worcester Regional Airport represented less than 1% of the total Revenues of the Authority and Worcester's Operating Expenses constituted approximately 2.3% of the Authority's Operating Expenses and represented an operating loss of approximately \$7.8 million before debt service and other capital expenses. In fiscal year 2015, Worcester Regional Airport generated an operating loss of approximately \$7.4 million before debt service and other capital expenses. Worcester Airport had \$1.6 million in operating revenues in fiscal year 2016, a slight decline of \$52,000 compared to the prior year.

## **Port Properties**

Maritime Operations includes container activity, cruise passenger activity and automobile activity. Maritime Real Estate includes commercial real estate development and asset management, maritime real estate development and asset management. Project types and assets include office, hotel, residential, retail, seafood, warehouse and parking. With the exception of the Boston Fish Pier, these projects are developed and operated by private third-party entities that have entered into ground leases with the Authority. The department also negotiates

numerous license agreements for shorter term and temporary uses of Authority property. Since fiscal year 2006, the Authority has experienced small annual Port Properties operating surpluses.

In fiscal year 2016, the Revenue attributable to the Port Properties totaled approximately \$98.9 million, or approximately 14.0% of the Revenues of the Authority, and the Port Properties accounted for approximately \$83.0 million of Operating Expenses, or approximately 20.2% of the Authority's Operating Expenses. In fiscal year 2016, the Port Properties realized a surplus of \$15.8 million in Net Revenues, following a surplus of \$8.6 million in fiscal year 2015. The Net Revenue from Maritime Operations was a surplus of \$7.9 million for fiscal year 2016, while the Net Revenue from Maritime Real Estate was a surplus of \$7.9 million in fiscal year 2016. Revenues from Maritime Real Estate for the nine months ended March 31, 2017 include a one-time \$7.5 million lease extension payment to the Authority for property at 88 Black Falcon Avenue. Over the period shown, the Authority has pursued a policy of seeking compensatory pricing, aggressively negotiating new lease terms when possible, and revenue development through more intense use of the Port Properties and a marketing program designed to increase the volume of containers handled and the number of cruise passengers who embark or disembark in Boston. In fiscal year 2016, revenue from container operations increased by \$6.4 million or 12.1% as Conley Terminal processed a record 140,967 containers.

**Investment Income.** Investment income increased to \$5.7 million in fiscal year 2016 from \$3.8 million in fiscal year 2015, as the Authority had more cash available to invest and was able to take advantage of a higher interest rate environment.

#### MANAGEMENT'S DISCUSSION OF FORECAST ASSUMPTIONS

The following discussion elaborates on the information contained in the above table entitled "Forecasted Operating Results and Debt Service Coverage Under the 1978 Trust Agreement" and reflects the most current information available to the Authority. The table and ensuing discussion contain pro-forma forecasts for the period covering fiscal year 2017 through fiscal year 2021. This prospective information was prepared by the Authority in accordance with accounting principles required by the 1978 Trust Agreement in order to show projected debt service coverage; such information was not prepared with a view toward compliance with the guidelines established by the American Institute of Certified Public Accountants for preparation and presentation of prospective financial information. The forecasts were prepared by the Authority's staff. LeighFisher prepared a review of the Authority's Airport Net Revenues Forecasts in connection with the issuance of the 2017 Bonds. In the opinion of LeighFisher, the assumptions upon which the Authority's forecasts are based provide a reasonable basis for such forecasts. See APPENDIX D to the Official Statement for the 2017 Bonds, which should be read in its entirety for an understanding of the forecasts and the key underlying assumptions therein.

For fiscal year 2017, projections are based on the Authority's unaudited actual results through March 31, 2017 and the forecasted budget for the remaining three months of fiscal year 2017. Revenues were forecasted to be \$757.5 million for fiscal year 2017 and the forecasted Operating Expenses total \$441.2 million. Through March 31, 2017, operating revenues of \$570.9 million were 6.5% above budget and \$55.2 million above the same time period in fiscal year 2016. Total Revenues of \$576.4 million were \$37.1 million, or 6.9% above budget for the same period. For the same period, Operating Expenses of \$324.1 million were \$8.6 million or 2.6% below budget for the first nine months of fiscal year 2017. Net revenues of \$252.4 million for the first nine months of the fiscal year were \$45.7 million or 22.1% greater than budgeted.

The forecasts reflected in the table assume: (a) an increase of operating costs in fiscal year 2017, compared to fiscal year 2016 actual results, of (i) 8.4% for Logan Airport, (ii) 1.5% at Hanscom Field and (iii) 4.0% at the Port Properties; (b) a slight decline of operating costs at Worcester Regional Airport of 1.0% in fiscal year 2017; (c) growth of baseline operating costs at 5.7% on average annually in fiscal years 2017 and thereafter; (c) inflation of capital costs (to the mid-point of construction) at 4.0% annually; (d) investment income (other than for investment agreements currently in effect) at a rate of 1.0% annually; (e) average interest rates of 6.0% on the currently planned future Bond issues; (f) completion dates for capital projects as currently contained in the FY17-FY21 Capital Program; and (g) the addition of staff and contract services in future years, as necessary, to operate new facilities as they are placed in service.

The Authority believes that the forecasts reflected in the table are conservative in nature. For example, the financial forecast assumes that enplaned passengers in fiscal year 2017 will be 6.1% higher than that in fiscal year 2016; actual enplaned passenger growth, however, for the nine months ending March 31, 2017 was 7.8% higher than passenger growth for the same period in the prior year. Passenger levels are then forecast to increase 3.0% in fiscal year 2018, 2.0% in fiscal year 2019 and 1.0% in fiscal year 2020 and fiscal year 2021. These forecasts do not assume any significant future disruptions to air travel or cessation of service by any air carrier now serving the Airport. This forecast is intended to be conservative to aid in financial planning and can be contrasted with the Authority's planning forecast and the FAA's terminal area forecast for Logan Airport. See APPENDIX C – Boston Logan International Airport Market Analysis under the heading “Review of Massport Activity Forecasts.” If the forecasted Revenues are not realized in a material way, then the Authority expects that it will not execute all of the projects listed in the FY17-FY21 Capital Program. The Authority's willingness and ability to reduce capital spending when events so require was demonstrated in its response to the events of September 11, 2001 and in the subsequent adherence to the financial recovery plan put in place thereafter. In addition, forecasted revenues do not include PFCs or CFCs collected by the Authority. See “CAPITAL PROGRAM – Funding Sources – Passenger Facility Charges” and “ – Customer Facility Charges.”

### **Airport Properties**

Forecasted revenues from landing fees and terminal rentals reflect the periodic revision of such charges at rates designed to recover the net annual cost of providing these airport facilities. Net annual costs include all operating expenses and amortization of capital costs, less any PFC revenues applied to these projects and any federal grant funds received for these projects. For the five-year period from fiscal year 2017 to fiscal year 2021, landing fee revenues are forecasted to increase at an average annual rate of 4.8%. The increases over the forecast period are attributable to the inclusion in the rate base of airfield capital costs, including allocable capital costs from other Airport capital projects and increased operating costs.

Terminal building rental revenues from fiscal year 2017 through fiscal year 2021 are projected to increase at an average annual rate of 6.1%, reflecting the additional build out of terminal facilities coming into service. In fiscal year 2017, terminal building rental revenues are forecast to be \$158.0 million, which is 11.1% greater than fiscal year 2016. The increase forecasted for fiscal year 2017 reflects the increase in passengers, reduced airline vacancies (primarily due to the expansion of service by JetBlue), additional allocable capital costs from Airport capital projects and increased operating costs. See “AIRPORT PROPERTIES – Airport Facilities; Lease Arrangements for Terminal Facilities.” Terminal building rentals also include baggage fees calculated to recover the Authority's cost of operating baggage screening in unleased space and per passenger fees that recover Terminal E costs related to international passengers and unleased, common-use space.

In fiscal year 2017, Revenues from non-terminal and ground rents are forecasted to decline approximately 0.5%. The Board has voted to increase Logan Airport parking rates by \$3.00/day in each of fiscal years 2017, 2018 and 2020. The Authority is forecasting that the increase in parking rates, offset by a slight decrease in total parking exits in the short term due to the higher rates, will add approximately \$10.2 million in parking revenues, on average, in each of fiscal years 2017, 2018 and 2020, which amounts are expected to be used to further fund operating and capital projects. From fiscal year 2017 through fiscal year 2021, concession revenues are forecasted to stay approximately flat at an average annual rate of (0.1)%. While concession revenues are forecasted to stay approximately flat over the forecast period, the Authority recently went through a formal Request for Proposal solicitation process for Logan's concession program, pursuant which the entire concession program across all Terminals was rebid and restructured into one new agreement that was awarded to MarketPlace Logan LLC (“*Marketplace Logan*”). The Authority and MarketPlace Logan are currently finalizing the 10-year lease agreement, which the Authority expects will lead to improved efficiencies and higher returns for the concession program.

From fiscal year 2017 through fiscal year 2021, revenues at Hanscom Field are forecasted to stay approximately flat at an average annual rate of (0.3)%, while expenses are forecasted to increase at an average annual rate of 5.6% from fiscal year 2017 through fiscal year 2021. Revenues at Worcester Regional Airport are forecasted to increase by 2.6% in fiscal year 2017, then increase 3.7% thereafter. Worcester Regional Airport operating expenses are forecasted to stay approximately flat at (0.1)% in fiscal year 2017 and then increase 11.8% thereafter due to the additional ARFF operations assumed by the Authority beginning in fiscal year 2019. Assuming a combination of low inflation and limited programmatic growth thereafter, Operating Expenses of the Airport

Properties are forecasted to increase at a rate of 7.1% from fiscal year 2017 to fiscal year 2018, and at an average annual rate of 5.0% for the remainder of the forecast period.

Forecasted Revenues and Operating Expenses of the Airport are based in part on assumptions regarding future levels of total passengers. The financial forecast assumes that enplaned passengers in fiscal year 2017 will be 6.1% higher than that in fiscal year 2016 (based on actual Airport enplaned passenger growth of 7.8% for the first nine months of the fiscal year (through March 2017), and an estimate of 1.5% growth for the remaining three months (April – June 2017)), and then estimates 3.0% growth in fiscal year 2018, 2.0% growth in fiscal year 2019 and 1.0% growth per year in 2020 and 2021. Such estimates reflect the Authority’s preference for using conservative estimates in its financial planning.

The following table shows forecast total enplaned passengers and total passengers at the Airport from fiscal year 2017 through fiscal year 2021, as well as forecast revenue per enplaned passenger, debt per enplaned passenger and airline cost per enplaned passenger, for the same period.

	<b>Logan Airport – Growth Forecast</b>				
	<b>(000s)</b>				
	<u>FY 2017</u>	<u>FY 2018</u>	<u>FY 2019</u>	<u>FY 2020</u>	<u>FY 2021</u>
Enplaned Passengers	18,391	18,942	19,321	19,514	19,710
Total Passengers <sup>1</sup>	36,907	38,014	38,774	39,162	39,554
<i>Percentage Change</i>	--	3.0%	2.0%	1.0%	1.0%
Revenue Per Enplaned Passenger	\$34.04	\$34.91	\$35.13	\$36.18	\$36.55
Debt Per Enplaned Passenger <sup>2</sup>	\$75.78	\$74.72	\$81.66	\$85.12	\$86.19
Airline Cost Per Enplaned Passenger	\$14.29	\$15.51	\$15.71	\$16.30	\$16.63

<sup>1</sup> Excludes general aviation.

<sup>2</sup> Calculation based upon outstanding principal amount of Bonds. Includes the 2017 Bonds and excludes the Bonds to be refunded with proceeds of the 2017 Bonds. Includes the expected issuance of \$453.1 million aggregate par amount of 2018 Bonds, 2019 Bond and 2020 Bonds. Excludes PFC Debt that may be issued during this period (see “CAPITAL PROGRAM – Funding Sources – Passenger Facility Charges”).

The Airport Market Analysis states that the Authority’s baseline financial forecast of enplanement growth at the Airport of 3.0% in fiscal year 2018, 2.0% in fiscal year 2019 and 1.0% per year thereafter is reasonable and conservative compared to the FAA forecast and the Airport’s historical annual growth. Further, the Airport Market Analysis states that the Authority’s planning forecast of enplanement growth at the Airport of 1.2% per year between 2016 and 2030 represents a reasonable projection of future passenger activity at the Airport.

The Authority has assumed that it will receive approximately \$47.8 million of federal TSA, AIP entitlement, noise and other discretionary grant reimbursements during the period from fiscal year 2017 through fiscal year 2021. If these funds are not received, projected landing fees and/or checked bag fees could increase over the coming years. There can be no assurance that such AIP or TSA grant funds will be available in the amounts or at the times projected. See “AVIATION INDUSTRY CONSIDERATIONS – Considerations Regarding Other Sources of Revenue; Federal Grants-in-Aid” and “– Considerations Regarding Other Sources of Revenue; FAA Reauthorization and Level of Federal Airport Grant Funding.”

### **Review of the Boston Regional Market Analysis**

The Market Analysis Report set forth in APPENDIX C to the Official Statement was prepared by ICF in connection with the issuance of the 2017 Bonds. Such report is set forth herein in reliance upon the knowledge and experience of such firm as airport consultants.

### **Review of Airport Properties Net Revenues Forecasts by Consultants**

LeighFisher prepared a review of the Authority’s Airport Properties Net Revenue Forecasts in connection with the issuance of the 2017 Bonds, which is included as APPENDIX D to the Official Statement. The review should be read in its entirety for a fuller understanding of the forecasts and the key underlying assumptions therein. In the opinion of LeighFisher, the assumptions upon which the Authority’s forecasts are based provide a reasonable

basis for the forecasts. As stated in the review, any forecast is subject to uncertainties. Inevitably, some assumptions will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results and those differences may be material.

### **Port Properties**

Maritime Operations Revenues are forecasted to increase 6.1% in fiscal year 2017, and then increase at an average annual rate of 2.6% thereafter through fiscal year 2021, while expenses are projected to increase 2.7% in fiscal year 2017, and then increase at an average annual rate of 4.7% thereafter through fiscal year 2021. Maritime Operations is expected to have a surplus of \$10.6 million in Net Revenues in fiscal year 2017, primarily due to the increased containers serviced at Conley Terminal. The estimated fiscal year 2017 container volume is expected to be approximately 141,000 containers. Container volumes are forecasted to be 138,000 in fiscal year 2018, and then increase by 3.0% in each year thereafter through fiscal year 2021.

Revenues from Maritime Real Estate are forecasted to increase 29.1% in fiscal year 2017, largely due to a one-time \$7.5 million lease extension payment in fiscal year 2017 for property at 88 Black Falcon Avenue. Excluding the one-time payment, revenues are forecast to grow at an average annual rate of 2.4% from fiscal year 2018 through fiscal year 2021. Revenue forecasts are not included for projects currently without signed leases. The forecast also assumes a 5.4% average annual increase from fiscal year 2017 through fiscal year 2021 in Maritime Real Estate Operating Expenses.

### **Investment Income**

The Authority's forecasts of investment income assume that existing investments are held until maturity at their respective stated rates of interest and that available cash will be reinvested at an interest rate of 1.0% annually.

### **Debt Service and Coverage**

The Authority's forecasts include the issuance of additional Bonds in fiscal years 2019, 2020 and 2021 to provide adequate capital for the Bond funded projects identified in the FY17-FY21 Capital Program. See "CAPITAL PROGRAM – Funding Sources." In addition to the 2017 Bonds, the Authority plans to issue future bonds to fund a portion of the FY17-FY21 Capital Program, including: (i) \$196.9 million of project costs in fiscal year 2019, (ii) \$125.0 million in fiscal year 2020, and (iii) \$93.7 million in fiscal year 2021. There can be no assurance, however, that the amount and timing of these Bond issues will be as set forth in the preceding sentence. The 2018 Bonds, the 2019 Bonds and the 2020 Bonds are assumed to include no capitalized interest during the construction period and bear interest at a rate of 6.0%. The future bond issues are assumed to include bond proceeds to fully fund the Reserve Account to an amount equal to the Reserve Account requirement. See "SECURITY FOR THE 2017 Bonds – Reserve Accounts" in the Official Statement. The Authority does not project that this amount of additional debt will have an adverse impact on its ability to comply with the coverage requirements of the 1978 Trust Agreement.

Forecasted coverage for the Authority's forecasted annual debt service is set forth in the table on page A-44. There can be no assurance, however, that these coverage levels will be achieved. The coverage levels presented do not include PFC or CFC revenues or any debt service for debt payable from PFCs or CFCs, such as the PFC Debt that may be issued during the forecast period (see "CAPITAL PROGRAM – Funding Sources – Passenger Facility Charges"). For a discussion of the requirements relating to issuance of additional Bonds, see the section entitled "SECURITY FOR THE 2017 BONDS – Additional Bonds" in the Official Statement.

The Authority expects that the non-Bond funded projects of the FY17-FY21 Capital Program will be financed from the expenditure of proceeds from commercial paper, the application of PFCs on a pay-as-you-go basis, the application of CFCs, private sources of capital, federal and other grants and cash flow from operations. The Authority's capital program is designed to be modular, and the Authority expects to undertake projects only after sufficient funding has been secured.

## DEBT SERVICE REQUIREMENTS UNDER THE 1978 TRUST AGREEMENT

The following table sets forth debt service on the Authority's outstanding Bonds<sup>(1)</sup> and the 2017 Bonds for each fiscal year in which such Bonds will be outstanding (rounded to the nearest dollar). Column totals may not add due to rounding.

Year Ending <u>July 1</u>	Other Outstanding Fixed Rate Bonds <u>Debt Service<sup>(2)(4)</sup></u>	2017 Bonds <u>Debt Service</u>		Total Debt <u>Service<sup>(3)</sup></u>
		<u>Principal</u>	<u>Interest<sup>(4)</sup></u>	
2018	\$103,303,100	\$5,565,000	\$4,403,981	\$113,272,081
2019	99,046,956	6,095,000	4,357,519	109,499,475
2020	99,162,226	6,880,000	4,052,769	110,094,995
2021	96,056,599	9,205,000	7,548,000	112,809,599
2022	96,069,458	9,970,000	7,087,750	113,127,208
2023	96,188,448	8,225,000	6,589,250	111,002,698
2024	92,660,208	8,795,000	6,178,000	107,633,208
2025	92,766,550	9,380,000	5,738,250	107,884,800
2026	92,817,456	10,010,000	5,269,250	108,096,706
2027	92,839,565	10,670,000	4,768,750	108,278,315
2028	84,154,713	8,960,000	4,235,250	97,349,963
2029	80,234,323	3,770,000	3,787,250	87,791,573
2030	74,104,688	2,560,000	3,598,750	80,263,438
2031	74,217,325	2,685,000	3,470,750	80,373,075
2032	74,262,075	2,820,000	3,336,500	80,418,575
2033	74,301,075	2,960,000	3,195,500	80,456,575
2034	61,504,075	3,110,000	3,047,500	67,661,575
2035	61,512,075	3,265,000	2,892,000	67,669,075
2036	50,153,850	3,430,000	2,728,750	56,312,600
2037	50,225,275	3,600,000	2,557,250	56,382,525
2038	47,573,350	3,780,000	2,377,250	53,730,600
2039	45,925,350	3,970,000	2,188,250	52,083,600
2040	45,923,775	4,165,000	1,989,750	52,078,525
2041	60,346,650	4,375,000	1,781,500	66,503,150
2042	60,344,900	4,595,000	1,562,750	66,502,650
2043	52,683,400	4,825,000	1,333,000	58,841,400
2044	52,684,150	5,065,000	1,091,750	58,840,900
2045	46,410,350	5,320,000	838,500	52,568,850
2046	34,694,400	5,585,000	572,500	40,851,900
2047	-	<u>5,865,000</u>	<u>293,250</u>	<u>6,158,250</u>
	<u>\$2,092,166,361</u>	<u>\$169,500,000</u>	<u>\$102,871,519</u>	<u>\$2,364,537,880</u>

<sup>(1)</sup> Does not include commercial paper or debt service on obligations of the Authority not secured on a parity with the Bonds under the 1978 Trust Agreement, such as subordinated revenue bonds, PFC Revenue Bonds (defined herein), CFC Revenue Bonds (defined herein) and special facilities revenue bonds. For a description of such other obligations, see "OTHER OBLIGATIONS." Excludes PFC Debt that may be issued during this period (see "CAPITAL PROGRAM – Funding Sources – Passenger Facility Charges").

<sup>(2)</sup> The figures shown in this column combine Bond Debt Service for the outstanding 2008-C Bonds, 2010 Bonds, 2012 Bonds, 2014 Bonds, 2015 Bonds and 2016 Bonds. Does not include the 2007-C Bonds to be refunded by the 2017 Bonds.

<sup>(3)</sup> Totals may not add due to rounding.

<sup>(4)</sup> Amounts shown are net of capitalized interest.



## OTHER OBLIGATIONS

The following describes the indebtedness and obligations of the Authority that are not secured under the 1978 Trust Agreement or that are secured on a subordinated basis. See APPENDIX B to the Official Statement – Financial Statements of the Authority for further information.

### **PFC Revenue Bonds**

In June 2007, the Authority issued its PFC Revenue Bonds, Series 2007B and PFC Revenue Refunding Bonds, Series 2007D (the “*2007 PFC Revenue Bonds*”), pursuant to the PFC Trust Agreement by and between the Authority and The Bank of New York Mellon Trust Company, N.A., as trustee (the “*PFC Trustee*”), dated as of May 6, 1999 (the “*PFC Trust Agreement*”), as amended, and the Second Supplemental Agreement dated as of May 17, 2007 (the “*Second Supplemental PFC Trust Agreement*”) between the Authority and the PFC Trustee. In August 2010, the Authority issued its PFC Revenue Refunding Bonds, Series 2010-E (the “*2010 PFC Revenue Bonds*”), pursuant to the PFC Trust Agreement, as amended, and the Third Supplemental PFC Trust Agreement dated as of July 15, 2010 (the “*Third Supplemental PFC Trust Agreement*”) between the Authority and the PFC Trustee.

The 2007 PFC Revenue Bonds, the 2010 PFC Revenue Bonds and any additional bonds that may be issued under the PFC Trust Agreement on a parity therewith (collectively, the “*PFC Revenue Bonds*”) are secured by the PFCs imposed by the Authority at the Airport. The PFC Revenue Bonds are not secured by the Revenues that secure the Bonds or the CFC Pledged Receipts (as defined in the CFC Trust Agreement described below) that secure the CFC Revenue Bonds, and PFCs are not included in such Revenues or CFC Pledged Receipts.

As of July 2, 2017, there will be no PFC Revenue Bonds outstanding under the PFC Trust Agreement, as the final principal amount of \$52.9 million will mature on July 1, 2017.

### **CFC Revenue Bonds**

In June 2011, the Authority issued its Special Facilities Revenue Bonds (ConRAC Project), Series 2011A and 2011B (collectively, the “*2011 CFC Revenue Bonds*”) pursuant to the CFC Trust Agreement dated as of May 18, 2011 (the “*CFC Trust Agreement*”), by and between the Authority and U.S. Bank National Association, as trustee (the “*CFC Trustee*”). The proceeds of the 2011 CFC Revenue Bonds were used to finance the construction of the RCC.

The 2011 CFC Revenue Bonds and any additional bonds that may be issued under the CFC Trust Agreement on a parity with the 2011 CFC Revenue Bonds (collectively, the “*CFC Revenue Bonds*”) are secured by the CFC Pledged Receipts (as defined in the CFC Trust Agreement). The CFC Revenue Bonds are not secured by the Revenues that secure the Bonds or the PFC revenues that secure the PFC Revenue Bonds, and CFCs are not included in such Revenues or PFC revenues.

As of July 2, 2017, the 2011 CFC Revenue Bonds in an aggregate principal amount of \$194.6 million will be the only CFC Revenue Bonds outstanding under the CFC Trust Agreement.

### **Special Facilities Revenue Bonds**

The Authority has issued, and may in the future issue additional, special facilities revenue bonds to finance various capital projects on a non-recourse basis. The principal of and interest on the special facilities revenue bonds issued by the Authority are special obligations of the Authority, payable solely from the sources provided; none of such special facilities bonds are secured by the Revenues of the Authority. Each special facility revenue bond issue is secured differently and under a separate trust agreement.

As of July 2, 2017, the Authority will have approximately \$526.9 million of special facilities revenue bonds outstanding, as follows:

1. Special Facilities Revenue Bonds (BOSFUEL Project), Series 2007 (the “*BOSFUEL Bonds*”);
2. Special Facilities Revenue Bonds (Delta Air Lines, Inc. Project), Series 2001A, 2001B and 2001C (the “*Terminal A Bonds*”); and
3. Special Facilities Revenue Refunding Bonds (Harborside Hyatt Conference Center and Hotel Project), Series 2001-A (Tax-Exempt) and 2001-B (Taxable)

The Authority is under no obligation to assume the liability for the special facilities revenue bonds listed above or to direct revenue, other than a portion of the Terminal A rental revenues, which are pledged to pay debt service on the Terminal A Bonds. The portion of Terminal A rental revenues pledged to pay debt service on the Terminal A Bonds is calculated based on a formula set forth in the trust agreement governing such debt and the Authority’s lease with Delta. The portion of Terminal A rental revenues pledged to pay debt service on the Terminal A Bonds is not included in Revenues or Net Revenues of the Authority. In addition, the Authority has received FAA approval to use PFCs to pay a portion of the debt service on the Terminal A Bonds allocable to the public space within Terminal A and applies approximately \$12.0 million per year of PFCs for such purpose.

### **Subordinated Revenue Bonds**

On December 29, 2000 and January 2, 2001, the Authority issued its Subordinated Revenue Bonds, Series 2000-A, 2000-B and 2000-C, and Series 2001-A, 2001-B and 2001-C, respectively (collectively, the “*Subordinated Bonds*”) to finance acquisition of the ParkEX facility. The Subordinated Bonds, which as of July 2, 2017 will be outstanding in the aggregate principal amount of \$74.0 million, are payable solely from funds on deposit in the Improvement and Extension Fund in a separate account not subject to the pledge of the 1978 Trust Agreement, the PFC Trust Agreement or the CFC Trust Agreement. Funds on deposit in the separate account of the Improvement and Extension Fund held for the benefit of the Subordinated Bonds are currently invested in two guaranteed investment contracts, which at their respective maturity dates are expected to provide for the \$74.0 million principal payments of the Subordinated Bonds at their respective maturities on December 31, 2030 and January 1, 2031. The Subordinated Bonds are subordinate to the 2017 Bonds and all other outstanding Bonds issued under the 1978 Trust Agreement.

### **Commercial Paper**

On May 15, 2012, the Authority renewed its commercial paper program in an aggregate principal amount not to exceed \$100.0 million and entered into a three-year Letter of Credit and Reimbursement Agreement with TD Bank, N.A. (“*TDBank*”), to provide security for the commercial paper program. On March 4, 2014, the Authority amended the commercial paper program increasing the aggregate principal amount to up to \$150.0 million and extending the expiration of the Letter of Credit and Reimbursement Agreement with TD Bank to June 1, 2017. The expiration date of the Letter of Credit and Reimbursement Agreement with TD Bank was recently extended to June 1, 2022. As of June 1, 2017, the Authority had outstanding \$109.0 million of commercial paper notes. The obligations of the Authority with respect to its commercial paper notes are secured by the Improvement and Extension Fund and the proceeds of Bonds subsequently issued for that purpose. While PFCs are not pledged to secure the Authority’s commercial paper, the Authority currently expects to repay a significant portion of the notes from the PFC Capital Fund.

## **DEBT ISSUANCE AND DEBT MANAGEMENT POLICY**

In February 2010, the Authority initially adopted a Debt Issuance and Debt Management Policy (“*Debt Policy*”). The Debt Policy covers the types of debt that the Authority may issue; the legal, policy and financial limits that govern the issuance of debt; the use of derivatives; debt structuring practices; debt issuance practices; and debt management practices including tax law requirements, arbitrage regulations, investment of bond proceeds, disclosure and records retention. The policy requires the Members of the Authority to review and consider revisions to the policy every two years. Pursuant to the Debt Policy, projects that are funded with Bond proceeds should be central to the Authority’s core mission; debt issuance practices should support the maintenance of the Authority’s

long term credit ratings; and Bond-funded projects must be included in the Authority’s five-year capital program. Specific financial metrics, including those listed below, were established for the five-year capital program in support of these objectives.

	<b>Debt Policy Goal</b>
Annual Debt Service Coverage	1.75x
Contribution Margin <sup>1</sup>	> or = 30%
Contribution Margin (Logan Airport)	> or = 30%
Operating Ratio <sup>2</sup>	< or = 70%

<sup>1</sup> *Contribution Margin: (operating revenues minus operating expenses and PILOT payments<sup>3</sup>)/total operating revenues.*

<sup>2</sup> *Operating Ratio: (operating expense plus PILOT payments)/operating revenues.*

<sup>3</sup> *Annual PILOT payments for fiscal years 2017 through 2021 are forecast to be \$19.3 million, \$21.5 million, \$21.9 million, \$22.3 million and \$22.8 million, respectively.*

The Members of the Authority most recently reviewed and re-adopted the Debt Policy in April 2016. Currently, the Authority has no outstanding Financial Hedges (as defined under “GENERAL OPERATIONAL FACTORS – Financial Hedge Policy”).

## AVIATION INDUSTRY CONSIDERATIONS

### General Economic Conditions

Historically, the financial performance of the air transportation industry has correlated with the state of the national and global economy. Following significant and dramatic changes that occurred in the financial markets in September 2008, the U.S. economy experienced a recession followed by weak economic growth. More recently, the significant improvement in economic conditions in the U.S. has contributed to the rebound in aviation activity levels nationwide. It is not known at this time whether the improving national unemployment rate or the current rate of national and global economic growth will persist beyond 2017 and what effect, if any, they will have on the air transportation industry.

### Financial Condition of the Airline Industry

The number of passengers using the Airport will depend partly on the profitability of the U.S. airline industry and the associated ability of the industry and individual airlines to make the necessary investments to continue providing service. The airline industry has historically been highly cyclical and is characterized by intense competition, high operating and capital costs, and varying demand. Passenger and cargo volumes are highly sensitive to general and localized economic trends, and passenger traffic varies substantially with seasonal travel patterns. After an exceptional period of volatility in the 2000s, the outlook for U.S. carrier profitability in the near-term is positive, with the U.S. airline industry having posted its sixth consecutive year of profitability in 2016. This comes as U.S. carriers have continued to exercise significant capacity discipline in recent years by eliminating unprofitable routes and redundant services, reducing service at smaller hubs and in less profitable markets, and focusing on the use of right-sized aircraft to serve markets. In addition, an increase in fees for ancillary services, such as checked baggage, flight reservation and cancellation, early boarding, seat selection and food service has also helped to increase revenues. While there is cautious optimism that the U.S. airline industry is moving to a cycle of sustainable profits, the profitability of the airline industry, nonetheless, may still fluctuate dramatically from quarter to quarter and from year to year, even in the absence of catastrophic events such as the terrorist attacks of September 11, 2001 and the economic recession of 2008 and 2009.

Further, due to the discretionary nature of business and personal travel spending, airline passenger traffic and revenues are heavily influenced by a variety of factors, including: (i) the strength of the U.S. economy and other regional and world economies, (ii) the cost and availability of labor, fuel, aircraft and insurance, (iii) international trade, (iv) currency values, (v) competitive/partnership considerations, including the effects of airline ticket pricing, (vi) traffic and airport capacity constraints, (vii) governmental regulation, including security regulations and taxes

imposed on airlines and passengers, and maintenance and environmental requirements, (viii) passenger demand for air travel, including the availability of business travel substitutes such as teleconferencing, videoconferencing and web-casting, (ix) strikes and other union activities and (x) disruptions caused by airline accidents, criminal incidents, acts of war or terrorism and weather and natural disasters.

In March 2017, the Trump Administration issued an executive order imposing, among other matters, a temporary ban on travel to the U.S. by nationals from six countries in the Middle East and Africa. Two U.S. Circuit Courts of Appeals upheld district court injunctions preventing the enforcement of the proposed travel ban and several other provisions of the executive order. On June 26, 2017, the U.S. Supreme Court accepted appeals of these decisions. The cases will be heard at the first session of the U. S. Supreme Court's October 2017 term. The U.S. Supreme Court also granted a partial stay of the earlier injunctions allowing partial implementation of the executive order. The short-term and longer-term impacts of this partial travel ban and any similar possible future actions are unclear. Sustained future increases in passenger traffic will depend on global economic growth, stable and secure international conditions, and government policies that do not materially restrict international travel.

The Airport Market Analysis included in APPENDIX C and the Review of Airport Properties Net Revenues Forecasts included in APPENDIX D each reflect that, historically, airline travel demand has recovered from temporary decreases stemming from recessions, carrier liquidations, terrorist attacks and international hostilities. See APPENDIX C – Boston Logan International Airport Market Analysis under the heading “Industry Overview” and APPENDIX D – Review of Airport Properties Net Revenues Forecasts under the heading “Key Factors Affecting the Net Revenues Forecast – Passenger Traffic – The Financial Health of the Airline Industry.” Given the strong origin-destination character of the Airport's market, the travel intensity of Boston area's key industries and the high per capita income of the region, the Authority's airport consultants expect that future demand for airline travel at the Airport will depend primarily on economic factors, rather than the financial health of any given air carrier. See APPENDIX C – Boston Logan International Airport Market Analysis and APPENDIX D – Review of Airport Properties Net Revenues Forecasts under the heading “Key Factors Affecting the Net Revenues Forecast” for a further discussion of certain factors affecting future airline traffic.

While the Authority believes that it is less vulnerable to the economic condition of individual airlines because of Logan Airport's high percentage of origin-destination passengers and because no single airline accounts for a majority of enplaned passengers, no assurance can be given as to the financial stability or profitability of the airline industry or of any airline in particular. The Authority makes no representation with respect to the continued viability of any of the carriers serving the Airport, airline service patterns, or the impact of any Airport revenues. No assurance can be given that airlines serving the Airport will not eliminate or reduce service.

### **Airline Consolidation**

In 2005, ten major airlines were flying inside the United States (AirTran, Alaska Airlines, American Airlines, America West, Continental, Delta, Northwest, Southwest, United and US Airways) and accounted for 87.0% of all available seats. Faced with declining profitability due to increased costs of aviation fuel, lower fares brought on by the proliferation of low cost carriers (as described below), reduced growth potential in the domestic markets and declining passenger activity based on security concerns, the airlines pursued consolidation. As a result of these consolidations, today there are four major airlines flying inside the United States (American, Delta, Southwest and United) that account for over 85% of domestic capacity (available seats). Most recently, in December 2016, Alaska Airlines acquired Virgin America, and a single operating certificate is expected to be issued in 2018. The proposed merger, which is currently pending U.S. regulatory approval, will make Alaska Airlines the fifth largest domestic carrier in terms of seat capacity. Such consolidation, combined with a focus on driving profitability via capacity discipline and unbundling of services and resulting increased fee income, has increased airline profitability. Airline analysts expect the consolidated entities will continue to remain profitable in the near-term with a continued focus on return on invested capital through capacity discipline.

Further airline consolidation remains possible. Depending on which airlines serving the Airport, if any, merge or join alliances, the result may be fewer flights or decreases in gate utilization by one or more airlines. Such decreases could result in reduced Airport revenues, reduced PFC collections and increased costs for the airlines serving the Airport. For the reasons stated in APPENDIX C to the Official Statement, the Authority believes that the Airport is at a relatively low risk of losing passenger traffic due to further mergers, consolidations or

liquidations, beyond some short-term disruption, because of the underlying strengths of the Boston market. See APPENDIX C – Boston Logan International Airport Market Analysis.

### **Growth of Low Cost Carriers**

Low cost carriers (“LCCs”) are carriers that take advantage of an operating cost structure that is typically significantly lower than the cost structure of the network carriers. These advantages can include lower labor costs, greater labor flexibility, a streamlined aircraft fleet (i.e., fewer different types of aircraft in a given airline’s fleet) and a generally more efficient operation. These low costs suggest that the LCCs can offer a lower fare structure to the traveling public than network carriers while still maintaining profitability. Further, increased access to major markets for LCCs may moderate average airfare increases that can typically result from airline consolidation. In calendar year 2016, LCCs provided approximately 29% of the airline seat capacity in the U.S. market.

As the larger U.S. carriers consolidated and became more focused on capacity discipline, fare increases took hold. LCCs began to emerge in larger markets where passenger levels were high enough for the LCCs to overcome certain barriers to entry caused by the larger carriers such as, for example, control of the majority of airport gates and slots. The cost structure of LCCs allows for lower fares, which has stimulated traffic and driven LCCs into more and larger markets. One result of the consolidation of carriers and their capacity discipline and the associated fare increases is that certain price-sensitive travelers are flying less. Recently, these budget conscious flyers have emerged as an underserved segment which has helped to expand the LCC market to include the ultra-low cost carriers (“ULCCs”), such as Allegiant, Frontier and Spirit.

LCCs and ULCCs have significantly increased their service at the Airport. Five domestic LCCs and ULCCs currently operate at the Airport—JetBlue, Southwest, Spirit Airlines, Sun Country and Virgin America. These airlines collectively lease (either directly from the Authority or through sublease arrangements with other carriers) 32 gates at the Airport. As mentioned under “AIRPORT PROPERTIES – Boston-Logan International Airport – Airline Passenger Services” herein, JetBlue has grown to become the largest carrier at the Airport with a market share of 26.6% in fiscal year 2016. In addition to these domestic LCCs, five foreign flag LCCs—Air Berlin, Norwegian Air Shuttle, Thomas Cook, WestJet and WOW Air—provide international service to eight destinations. The foreign flag LCCs use the common use gates in Terminal E with the exception of WestJet, which subleases a gate in Terminal A from Delta. Low cost carriers account for 41% of Airport-wide scheduled departing seats in fiscal year 2017.

To some extent, the distinction between LCCs and the major network airlines has blurred in recent years. As the LCCs have started to serve airports in major metropolitan areas (such as JetBlue at Logan and New York-JFK and Southwest at New York-LaGuardia) in an effort to capture business travelers, and some LCCs have faced increases in labor costs (e.g., the JetBlue pilots unionized in April 2014), the cost base of the traditional LCC has trended upwards. In calendar year 2016, Southwest had an average unit cost of 11.2 cents, which was above that of network carrier Hawaiian Airlines (at 11.1 cents) and just below that of Alaska Airlines (at 11.3 cents). At the same time, the major network carriers have been adopting some of the practices and operational norms of the LCCs, resulting in a general downtrend for major network airline costs. As a result, the fare differential between LCCs and network carriers has narrowed in recent years.

### **Structural Changes in the Travel Market**

Many factors have combined to alter consumer travel patterns. The threat of terrorism against the United States remains high. As a result, the federal government has mandated various security measures that have resulted in new security taxes and fees and longer passenger processing and wait times at airports. Both add to the costs of air travel and make air travel less attractive to consumers relative to ground transportation, especially to short-haul destinations. Additionally, consumers have become more price sensitive. Efforts of airlines to stimulate traffic by heavily discounting fares have changed consumer expectations regarding airfares. Consumers have come to expect extraordinarily low fares. In addition, the availability of fully transparent price information on the internet now allows quick and easy comparison shopping, which has changed consumer purchasing habits. Consumers have shifted from purchasing paper tickets from travel agencies or airline ticketing offices to purchasing electronic tickets over the internet. This has made pricing and marketing even more competitive in the U.S. airline industry. Finally,

smaller corporate travel budgets, combined with the higher time costs of travel, have made business customers more amenable to communications substitutes such as tele- and video- conferencing.

### **Effect of Bankruptcy of Air Carriers**

Since 2001, several airlines with operations at the Airport have filed for and have subsequently emerged from bankruptcy protection, including United, Continental, Delta, Northwest, US Airways and, most recently, American Airlines in 2011. Additional bankruptcies, liquidations or major restructurings of other airlines could occur. The Authority's stream of payments from a debtor airline could be interrupted to the extent of unpaid fees for pre-petition goods and services, including accrued rent and landing fees. Under the U.S. Bankruptcy Code, a debtor airline that is a lessee under an unexpired lease with the Authority of non-residential real property, such as a lease of Terminal space or a hangar, is required within certain statutory time periods to assume or reject such lease. Rejection of a lease or other agreement or executory contract would give rise to an unsecured claim of the Authority for damages, the amount of which in the case of a lease or other agreement is limited by the U.S. Bankruptcy Code. The amount ultimately received in the event of a rejection of a lease or other agreement could be considerably less than the maximum amounts allowed under the U.S. Bankruptcy Code. Additionally, during the pendency of a bankruptcy proceeding, a debtor airline may not, absent a court order, make any payments to the Authority on account of goods and services provided prior to the bankruptcy. The Authority actively monitors past due balances to minimize any potential losses due to such proceedings, aggressively pursues overdue amounts and bankruptcy claims, and includes an allowance for uncollectible debts in its landing fee and terminal rental rates. Whether or not an airline agreement is assumed or rejected by a debtor airline in a bankruptcy proceeding, it is not possible to predict the subsequent level of utilization of the gates leased under such agreement.

It is not possible to predict the impact on the Airport of any future bankruptcies, liquidations or major restructurings of other airlines. Because of the Airport's high percentage of origin-destination passengers and because no single airline accounts for a majority of enplaned passengers, however, the Authority believes it is less vulnerable to the economic condition of individual airlines. In addition, the fact that no airline has given up a lease at Logan through decades of bankruptcies, although Delta renegotiated its lease, demonstrates the value airlines place on having a presence at Logan.

Potential investors are urged to review the airlines' financial information on file with the Securities and Exchange Commission (the "SEC") and USDOT. See also APPENDIX C – Boston Logan International Airport Market Analysis and "AVIATION INDUSTRY CONSIDERATIONS – Information Concerning the Airlines."

### **Cost of Aviation Fuel**

Airline earnings are significantly affected by changes in the price of aviation fuel. Fuel prices continue to be susceptible to, among other factors, political unrest in various parts of the world (particularly in the oil-producing nations in the Middle East and North Africa), Organization of Petroleum Exporting Countries policy, the rapid growth of economies such as China and India and resulting demand for oil-based fuels, the levels of inventory carried by industries, the amounts of reserves maintained by governments, the amount and availability of new sources of oil (e.g., U.S. "fracking" operations), disruptions to production and refining facilities and weather.

There has been no shortage of aviation fuel since the "fuel crisis" of 1974, but there have been significant price increases for fuel. From 2000 to 2008, the price of aviation fuel more than tripled. Oil prices reached an all-time record high of approximately \$145 per barrel in July 2008, and while they have declined from this elevated level, they have fluctuated significantly since then. During the second half of calendar year 2014, an imbalance between worldwide supply and demand resulted in a significant drop in the price of oil and aviation fuel. As of March 2017, the price of a barrel of crude oil was below \$50. According to Form 41 (US DOT), for calendar year 2016 fuel expenses were approximately 17.6% of U.S. passenger airline operating costs. Historically, significant fluctuations and prolonged increases in the cost of aviation fuel have adversely affected air transportation industry profitability, causing airlines to reduce capacity, fleet and personnel, to invest in new, more fuel efficient aircraft and equipment and to increase airfares and institute fuel, checked baggage, and other extra surcharges, all of which may reduce demand for air travel.

Many airlines engage in or have engaged in fuel hedging – purchasing fuel in advance at a fixed price through derivative contracts – to help manage the risk of future increases in fuel costs. However, there can be no assurance that any fuel hedging contract can provide any particular level of protection from volatile fuel prices. One carrier has even gone as far as to purchase its own refinery in order to better manage its fuel costs.

### **Aviation Security, Health and Safety Concerns**

Concerns about the security of airline travel and the effectiveness of security precautions, particularly in the context of potential international hostilities and terrorist attacks, may influence passenger travel behavior and air travel demand. Travel behavior may be affected by anxieties about the safety of flying and by the inconveniences and delays associated with more stringent security screening procedures, both of which may give rise to the avoidance of air travel generally and the switching from air to surface travel modes.

In March 2017, the U.S. implemented restrictions on carry-on electronic devices on planes coming to the U.S. from ten airports in Muslim-majority countries in the Middle East and North Africa in response to unspecified terrorism threats. Under these restrictions, passengers traveling from those airports are not permitted to bring devices larger than a cellphone, such as tablets, portable DVD players, laptops and cameras, into the main cabin; rather, those items must be in checked baggage. On June 28, 2017, the U.S. announced additional enhanced security measures for all commercial flights to the U.S., including enhanced screening of passengers and electronic devices and heightened security standards for aircraft and airports. The measures are expected to be implemented in the coming weeks. Airlines that fail to put the new security measures into effect could face fines, a total ban on electronic devices or be restricted from flying to the U.S. The impact of these restrictions on passenger travel behavior and air travel demand is unclear at this time.

Security concerns in the aftermath of the terrorist attacks on September 11, 2001 were largely responsible for the steep decline in airline travel nationwide in 2002. Since 2001, government agencies, airlines, and airport operators have upgraded security measures to guard against future terrorist incidents and maintain confidence in the safety of airline travel. These measures include strengthened aircraft cockpit doors, changed flight crew procedures, increased presence of armed sky marshals, federalization of airport security functions under the TSA, more effective dissemination of information about threats, more intensive screening of passengers, baggage and cargo, and deployment of new screening technologies. The airlines and the federal government were primarily responsible for, and bore most of the capital costs associated with, implementing the new security measures. No assurance can be given that these precautions will be successful. Also, the possibility of intensified international hostilities and further terrorist attacks involving or affecting commercial aviation are a continuing concern that may affect future travel behavior and airline passenger demand.

Public health and safety concerns have also affected air travel demand from time to time. In 2003, concerns about the spread of severe acute respiratory syndrome (SARS) led public health agencies to issue advisories against nonessential travel to certain regions of the world. In 2009, while the United States Centers for Disease Control and Prevention (“*CDC*”) and the World Health Organization (“*WHO*”) did not recommend that people avoid domestic or international travel, concerns about the spread of influenza caused by the H1N1 virus reduced international air travel, particularly to and from Mexico and Asia. In 2014, an outbreak of Ebola in West Africa and the discovery of a patient and health care workers infected with Ebola in the United States raised concerns about the spread of communicable disease through air travel. Most recently, in January 2016, the CDC issued a travel alert warning pregnant women to avoid travel to areas where the Zika virus, which has been linked to a type of birth defect called microcephaly, is spreading, a list that currently includes 22 countries and territories, primarily in the Caribbean, Central America, South America and certain Pacific Islands.

### **Information Concerning the Airlines**

Many of the principal domestic airlines serving the Airport, or their respective parent corporations, are subject to the information reporting requirements of the Securities Exchange Act of 1934, as amended, and in accordance therewith file reports and other information with the SEC. Likewise, foreign airlines serving the Airport that have American Depositary Receipts (“*ADRs*”) registered on a U.S. national exchange are subject to the same reporting requirements. Certain information, including financial information, concerning such domestic airlines, or their respective parent corporations, and such foreign airlines is disclosed in certain reports and statements filed with

the SEC. Such reports and statements can be inspected and copied at the public reference facilities maintained by the SEC and on its website.

Foreign airlines serving the Airport, or foreign corporations operating airlines serving the Airport (unless such foreign airlines have ADRs registered on a national exchange), are not required to file information with the SEC. Such foreign airlines, or foreign corporations operating airlines, serving the Airport file limited information only with the USDOT.

The Authority does not undertake any responsibility for or make any representation as to the accuracy or completeness of: (i) any reports and statements filed with the SEC or USDOT or (ii) any material contained on the SEC's website as described in the preceding paragraph, including, but not limited to, updated information on the SEC website or links to other Internet sites accessed through the SEC's website.

### **Forward-Looking Statements**

This Appendix A contains forecasts, projections and estimates that are based on current expectations. In light of the important factors that may materially affect the financial condition of the Authority and the aviation industry generally and other economic and financial matters, the inclusion in this Appendix A of such forecasts, projections and estimates should not be regarded as a representation by the Authority that such forecasts, projections and estimates will occur. Such forecasts, projections and estimates are not intended as representations of fact or guarantees of results.

As discussed in the Airport Market Analysis attached as APPENDIX C and the Review of Revenue Forecasts attached as APPENDIX D, the factors affecting aviation activity at the Airport include: the growth of population and of the economy in the Boston Primary and Secondary Market Service Area, airline service and route networks, the financial health and viability of the airline industry, national and international economic and political conditions, the availability and price of aviation fuel, levels of air fares, the capacity of the national air traffic control system and capacity at the Airport and elsewhere. See APPENDIX C – Boston Logan International Airport Market Analysis and APPENDIX D – Review of Airport Properties Net Revenues Forecasts. Each of these reports should be read in its entirety for an understanding of all of the assumptions used to prepare the respective forecasts made therein. No assurances can be given that these or any of the other assumptions contained in the Airport Market Analysis or the Review of Revenue Forecasts will materialize. Inevitably, some assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, the actual results achieved during the forecast period will vary, and the variations may be material. See “MARKET ANALYSIS AND REVIEW OF AIRPORT NET REVENUES” and “MANAGEMENT’S DISCUSSION OF FORECAST ASSUMPTIONS” herein and APPENDIX C – Boston Logan International Airport Market Analysis hereto and APPENDIX D – Review of Airport Properties Net Revenues Forecasts to the Official Statement relating to the 2017 Bonds. See also “Aviation Security and Health Safety Concerns” above.

### **Federal Law Affecting Airport Rates and Charges**

Federal aviation law requires, in general, that airport fees be reasonable and that, subject to the “grandfather provisions” discussed below (see “Considerations Regarding Other Sources of Revenue – Federal Grants-in-Aid”), in order to receive federal grant funding, all airport generated revenues must be expended for the capital or operating costs of the airport, the local airport system, or other local facilities owned or operated by the airport owner that are directly and substantially related to air transportation of passengers or property. Pursuant to the requirements of the Federal Aviation Administration Authorization Act of 1994 (the “1994 Aviation Act”), the USDOT and FAA have promulgated regulations setting forth an expedited hearing process to be followed in determining the reasonableness of airport rates and charges, and have also promulgated a policy statement (the “Rates and Charges Policy”), which sets forth the standards that the USDOT uses in determining the reasonableness of the fees charged to airlines and other aeronautical users.

In 1997, the United States Court of Appeals for the District of Columbia Circuit vacated the Rates and Charges Policy in part, determined that a portion of the Rates and Charges Policy was arbitrary and capricious and remanded it to the USDOT. In 2008, USDOT amended the Rates and Charges Policy to permit “congested airports,” as defined therein, to charge a two part landing fee that includes a per operation charge intended to help



reduce congestion and operating delays. Congested airports are also permitted to include certain other costs in their rate base, including the cost of certain construction in progress and costs associated with reliever airports, if owned by the same airport operator. The Airport does not currently qualify as a “congested airport.” The USDOT has not yet proposed any other revisions to the Rates and Charges Policy. If new guidelines are published, the costs that will be permitted to be included in determining an airport’s rate base and the extent to which such future guidelines may limit the Authority’s flexibility in negotiating new airline agreements or in setting rates and charges for use of the Airport’s airfield and non-airfield facilities cannot be determined at this time. Any new FAA guidelines or any standards promulgated by a court in connection with a dispute could limit the amounts and allocation of costs payable by airlines serving the Airport. Until the USDOT promulgates a new policy regarding rates and charges, the guiding principle for determining whether rates and charges established for use of airport assets is the requirement of federal law that such charges be “reasonable.”

The Authority is not aware of any formal dispute involving the Airport over any existing rates and charges, including the rates and charges for fiscal year 2017. The Authority believes that the rates and charges methodology utilized by the Authority and the rates and charges imposed by it upon air carriers, foreign air carriers and other aeronautical users operating at the Airport Properties are reasonable and consistent with applicable law. However, there can be no assurance that a complaint will not be brought against the Authority in the near-term with respect to the fiscal year 2017 rates and charges, or in the future, challenging such methodology and the rates and charges established by the Authority and, if a judgment is rendered against the Authority, there can be no assurance that rates and charges paid by aeronautical users of the Airport will not be reduced. See “AUTHORITY REVENUES – Airport Properties Revenues.”

#### **Considerations Regarding Other Sources of Revenue**

***Passenger Facility Charges.*** Under the PFC Act, the FAA may authorize a public agency to impose a PFC of up to \$4.50 on each passenger of an air carrier enplaned at any commercial service airport controlled by the public agency, subject to certain limitations. PFCs are available to airports to finance certain projects that (i) preserve or enhance capacity, safety or security of the national air transportation system, (ii) reduce noise resulting from an airport, or (iii) furnish opportunities for enhanced competition among air carriers and, with respect to a PFC of \$4.00 or \$4.50, that will make a significant contribution to improving air safety and security, increasing competition among air carriers, reducing current or anticipated congestion, or reducing the impact of aviation noise on people living near the airport. Under certain circumstances, the FAA grants approval to commence collection of PFCs (“impose only” approval) before approval to spend the PFCs on approved projects (“use” approval) is granted. Approval to both collect and spend PFCs is referred to as an “impose and use” approval.

No assurance can be given that PFCs will actually be received in the amount or at the time contemplated by the Authority. The amount of actual PFC revenues will vary depending on actual levels of qualified passenger enplanements at the Airport. In addition, the FAA may terminate the Authority’s ability to impose PFCs, subject to informal and formal procedural safeguards, if the Authority’s PFC revenues are not being used for approved projects in accordance with the FAA’s approval, the PFC Act or the regulations promulgated thereunder or the Authority otherwise violates the PFC Act or regulations. The Authority’s ability to impose a PFC may also be terminated if the Authority violates certain provisions of the Airport Noise and Capacity Act of 1990 and its implementing regulations. Furthermore, no assurance can be given that the Authority’s authority to impose a PFC may not be terminated by Congress or the FAA, or that the PFC program may not be modified or restricted by Congress or the FAA so as to reduce PFC revenues available to the Authority.

Passenger facility charges from passengers enplaned at Worcester Regional Airport are not pledged under the PFC Trust Agreement.

***Federal Grants-in-Aid.*** The Airport and Airway Improvement Act of 1982 created the AIP, which is administered by the FAA and funded by the Airport and Airway Trust Fund. This fund is financed by federal aviation user taxes. Grants are available to airport operators in the form of “entitlement” funds and “discretionary” funds. Entitlement funds are apportioned annually based upon enplaned passengers and discretionary funds are available at the discretion of the FAA based upon a national priority system. In addition, pursuant to the PFC Act, an airport’s annual federal entitlement grants are reduced by 50% following the imposition of PFCs of up to \$3.00, and 75% for PFCs in excess of \$3.00.

In fiscal years 2011 through 2015, the Authority was awarded TSA Other Transaction Agreement (OTA) grant funding for the Checked Baggage Inspection System in the amount of \$120.9 million, and as of March 31, 2017, payments totaling \$108.9 million were received. No assurance can be given that federal grants-in-aid will actually be received in the amount or at the time contemplated by the Authority.

Before federal approval of any AIP grant applications can be given, eligible airports must provide written assurances that they will comply with a variety of specified requirements. One such assurance is the so-called “airport generated revenues” assurance, which provides that all airport generated revenues will be expended for the capital or operating costs of the airport, the local airport system, or other local facilities owned or operated by the applicant that are directly and substantially related to air transportation of passengers or property. The airport generated revenues assurance, however, does not apply where provisions in laws or a covenant in debt obligations predating September 2, 1982 provide that the revenues from any of the airport owner’s or operator’s facilities, including the airport, be used to support the general debt obligations or other facilities of the airport owner or operator (the “grandfather provisions”). The Authority falls within the group of airports for which, under the grandfather provisions, the airport generated revenues assurance does not apply. Therefore, the Authority is legally permitted to operate all of its Properties on a consolidated financial basis.

The Authority is not aware of any dispute involving the Authority concerning the use of Airport Revenues. The Authority believes that the grandfather provisions apply to its use of Airport Revenues and that the Authority’s use of such Revenues is consistent with the applicable laws and regulations.

***FAA Reauthorization and Level of Federal Airport Grant Funding.*** On February 6, 2012, Congress passed a four-year reauthorization bill for the FAA—the FAA Modernization and Reform Act of 2012—which was signed into law on February 14, 2012 by the President and, after several extensions, will expire on September 30, 2017. The 2012 FAA reauthorization retained the federal cap on PFCs at \$4.50 and authorized \$3.35 billion per year for AIP through federal fiscal year 2015, which is \$150 million per year less than the funding level for the preceding five years. The AIP provides federal capital grants to support airport infrastructure through entitlement grants (determined by formulas based on passenger, cargo, and general aviation activity levels) and discretionary grants (allocated on the basis of specific set-asides and the national priority ranking system). The Authority is unable to predict the level of AIP funding at this time. If there is a reduction in the amount of AIP grants awarded to the Authority for the Airport, it could: (1) increase by a corresponding amount the capital expenditures that the Authority would need to fund from other sources (including operating revenues, and Bond proceeds), (2) extend the timing to complete certain projects, or (3) reduce the scope of individual proposed projects or the overall program, or both. See “CAPITAL PROGRAM – Funding Sources – Federal Grants” for more information regarding federal grant funding received by the Authority.

As mentioned above, the current FAA authorization statute will expire on September 30, 2017. Congress has held hearings on a long-term FAA reauthorization act but, as of the date of this Official Statement, no long-term reauthorization legislation has been approved by either house of Congress. Prior to the last reauthorization act, Congress enacted over 20 continuing resolutions providing temporary funding for the FAA and its programs, and during this period funding for and non-essential operations of the FAA was terminated once. There can be no assurance that Congress will enact and President Trump will sign an FAA reauthorization act before the current authorization terminates. Failure to adopt such legislation could have a material, adverse impact on U.S. aeronautical operations as well as on the AIP grant program.

## **Environmental Regulations**

The FAA has jurisdiction over certain environmental matters, including soundproofing. Airport noise is a significant federal and local issue, which may require substantial capital investments by the industry and/or airport operators, including the Authority, from time to time to meet applicable standards. The Authority implemented an extensive soundproofing program in 1984, which remains ongoing. As of March 2017, the Authority has invested over \$172.0 million through this program to treat 36 local schools and more than 11,500 dwelling units. See “GENERAL OPERATIONAL FACTORS – Local Impact Considerations.”

The EPA is responsible for regulating air quality and water quality. The potential exists for additional federal regulation that may require capital expenditures or changes in operations at the Authority's facilities. See also "GENERAL OPERATIONAL FACTORS – Environmental and Regulatory Considerations."

### **Growth of TNCs**

TNCs, such as Uber and Lyft, connect paying passengers with drivers who provide the transportation using their own commercial and non-commercial vehicles. The popularity of this type of ride-sourcing has increased because of the convenience of requesting a ride through a mobile application, the ability to pay for this service without providing cash or other payment to the hired driver and competitive pricing.

In August 2016, the Commonwealth enacted law governing the operation of TNCs and charged the Department of Public Utilities ("DPU") with oversight. In accordance with the law, DPU has begun the official rule making process for TNCs. The DPU and certain TNCs have executed a Memorandum of Understanding (the "DPU MOU") to implement certain aspects of the law pertaining to safety, in particular driver background checks, in advance of promulgating and adopting formal rules and regulations.

In February 2017, the Authority entered into operating agreements with Uber and Lyft, pursuant to which such TNCs are now permitted to pick up passengers at the Airport, irrespective of whether the TNC driver utilizes a commercial vehicle or a non-commercial vehicle. Pursuant to the operating agreement, the TNCs are required to remit a per-pick up fee to the Authority. The Authority plans to monitor all modes of ground transportation to assess the potential impacts from TNCs, however, at this time, the Authority cannot predict what impact, adverse or otherwise, those operations will have on other ground transportation services and parking at the Airport.

## **GENERAL OPERATIONAL FACTORS**

### **Personnel Considerations**

**Labor.** As of March 31, 2017, the Authority had 1,258 full-time employees. In addition, the Authority had 28 regular part-time and job share employees. There are nine bargaining units, each with separate collective bargaining agreements between the Authority and the eight unions representing these units, which represent a total of 689 of these full-time employees and 13 of these part-time employees. Of these nine collective bargaining agreements, eight currently have terms that run through 2018 or 2019. The remaining agreement expired on May 6, 2016 and is currently under negotiation. In general, upon the expiration of a collective bargaining agreement, the Authority's practice is to continue honoring the terms of such agreement until a new agreement takes effect. The Authority seeks to control its labor costs to the most prudent extent possible, and accordingly, none of its labor agreements provides for an automatic cost-of-living escalator. The Authority considers its relations with its employees and their union representatives to be good.

Massachusetts law prohibits strikes by employees of the Authority. In addition, the Massachusetts Supreme Judicial Court has declared that labor unions negotiating collective bargaining agreements with certain entities, including the Authority, do not have a statutory right to demand "interest arbitration" in the event of an impasse. Therefore, successor collective bargaining agreements cannot be imposed upon the Authority by any outside entity.

Approximately 329 members of the International Longshoremen's Association Locals 799, 800, 805, 1604 and 1066 (the "ILA"), which members are not Authority employees, work at Conley Terminal and Flynn Cruiseport Boston on either a full time or casual basis. The Authority, along with various stevedoring companies, shipping lines and terminal operators, constitute the Boston Shipping Association ("BSA"), which is a multi-employer association responsible for the negotiation and administration of collective bargaining agreements with the ILA. Decisions by the BSA on matters concerning negotiations and administration of collective bargaining agreements are binding on member employers. The current collective bargaining agreements between the BSA and the ILA will expire on September 30, 2018.

Certain users of the Authority's facilities that generate a substantial portion of the Authority's Revenues, such as the air carriers, are dependent upon successful management of their own labor relations for continuation of their operations. These matters are beyond the control of the Authority, and significant labor disputes in these areas could have an adverse effect upon the Revenues of the Authority.

**Non-Discrimination, Equal Opportunity and Affirmative Action.** The Authority is committed to affirmative action in its hiring of minorities, women, persons with disabilities and veterans in order to attract and retain a diverse workforce.

The Authority is committed to equality of economic opportunity and encourages and supports the inclusion of minority, women and disadvantaged business enterprises ("*M/W/DBEs*") in its contracting and procurement opportunities including concessions, construction and design, and goods and services. The Authority's commitment to equality of economic opportunity for M/W/DBEs includes relations with concessionaires, lessees, suppliers, contractors, consultants and others with whom it does business.

The Authority also encourages and supports economic opportunities for the residents of those neighboring communities (East Boston, South Boston, Charlestown, Chelsea, Winthrop, Revere, Leicester, Worcester, Lexington, Lincoln, Concord and Bedford) most directly impacted by the operation of the Authority's facilities.

### **Environmental and Regulatory Considerations**

Certain of the activities of the Authority are subject to review, or are otherwise affected, by a variety of environmental protection and other regulatory agencies including those set forth under this section.

**Federal Aviation Administration.** The FAA is responsible for the inspection and certification of various airfield facilities and procedures. In particular, federal law requires operators of air carrier airports (including the Authority) to hold a current airport certificate granted by the FAA evidencing satisfactory compliance with numerous operational and safety standards. The Authority holds valid Part 139 certificates from the FAA permitting all current operations at the Airport, Hanscom Field and Worcester Regional Airport. The FAA regulates the imposition, collection and use of PFCs and the FAA also administers federal AIP grants, and monitors compliance with numerous grant conditions. In addition, the FAA provides and maintains navigational aids at the Airport, Hanscom Field and Worcester Regional Airport and has exclusive control over airspace management and air traffic. See "AVIATION INDUSTRY CONSIDERATIONS."

**Transportation Security Administration.** Created in 2001 by the Aviation and Transportation Security Act, and part of the Department of Homeland Security, the TSA is responsible for transportation security nationally. In particular, TSA is required to screen all commercial airline passengers and all baggage loaded onto commercial airplanes, and has promulgated regulations regarding both aviation and maritime security applicable to the Authority's facilities.

**Federal Maritime Commission.** Pursuant to certain provisions of the Shipping Act of 1984, certain of the Authority's rates, charges and terms for marine terminal services must be filed with the Federal Maritime Commission.

**Environmental Protection Agency.** The EPA is ultimately responsible for administering air and water pollution control regulations, which directly affect operations of the Authority. Pursuant to requirements promulgated by the EPA under the Clean Air Act of 1970 and subsequent amendments thereto, the Authority is subject to the SIP Parking Limitation and certain limitations regarding other activities at the Airport, including heating plant performance standards. See "AIRPORT PROPERTIES – Airport Facilities – Parking Facilities." Under the federal Water Pollution Control Act, the Authority holds permits for certain discharges into Boston Harbor. The Authority and certain of its tenants as co-permittees were issued an individual stormwater permit for the Airport in September 2007, in accordance with the relevant EPA stormwater discharge regulations. The Authority conducts regular outfall water quality monitoring in compliance with its permits and routinely makes filings with the EPA as required. The Authority has in place strategies for compliance with all EPA requirements in this regard.

**Massachusetts Executive Office of Environmental Affairs.** The Massachusetts Environmental Protection Act requires certain public instrumentalities such as the Authority to determine the effect of their activities on the environment and to use all practicable means to minimize environmental damage. Furthermore, environmental assessment procedures administered by the Executive Office of Environmental Affairs apply to certain of the Authority's projects as well to certain projects, leases or permits authorized by the Authority.

**Other Regulatory Matters.** Numerous activities of the Authority require approvals of, or are subject to oversight by, state and federal agencies with jurisdiction over historic structures, wetlands, shorelines, harbors and other areas and over contamination and hazardous waste. These agencies include the U.S. Coast Guard, the Commonwealth's Coastal Zone Management Office, the Massachusetts Water Resources Authority, the Department of Environmental Protection, the U.S. Army Corps of Engineers and conservation and historic preservation commissions in the cities and towns in which the Authority's facilities are located. The Authority also is subject to certain statutes and regulations governing public bidding, health and safety, access for the disabled and matters relating to equal opportunity employment.

### **Local Impact Considerations**

The location of the Airport, bounded by residential neighborhoods and mixed residential and commercial areas, as well as wetland and open water habitats, necessitates that Airport development and operations be undertaken with sensitivity to environmental factors. The FAA's implementation of next generation flight procedures and technology has concentrated noise in a narrower band. This has resulted in increased complaints from communities under these concentrated paths near Logan Airport and at other communities nationwide. Logan's location as an urban airport and the impact of aircraft operations on nearby communities has led to the development of noise abatement programs by the Authority consistent with maintaining high quality air service for the New England area. The programs include noise abatement ground procedures, noise restrictions on certain runway ends, noise abatement turns on certain departure procedures, restrictions on flights by certain aircraft types during late-night hours (although the restricted aircraft types are largely no longer in use), and conducting single engine taxiing when appropriate. The Authority does not believe these programs have had, or are likely to have, a material effect on Airport Revenues.

A number of noise abatement programs have been instituted at Hanscom Field in order to reduce the impact of aircraft operations on surrounding communities. These programs include a computer-based program to monitor overall noise impact, noise abatement rules and regulations and nighttime fees and operations restrictions, and a 300-foot noise berm constructed adjacent to a residential neighborhood.

### **Financial Considerations**

**Authority Pension Funding.** The Massachusetts Port Authority Employees' Retirement System (the "Plan") is a single employer plan established on July 18, 1978, effective January 1, 1979, by enactment of Chapter 487 (an amendment to Chapter 32) of the General Laws of the Commonwealth to provide retirement benefits for substantially all employees of the Authority, and incidental benefits for their surviving spouses, beneficiaries and contingent annuitants. The Plan is a contributory defined benefit plan to which the Authority and its employees contribute such amounts as are necessary to provide assets sufficient to meet benefits to be paid to plan participants. Each year the Authority funds the Plan with an amount equal to the actuarially determined annual contribution using the Frozen Entry Age Actuarial Cost Method. The Plan is administered by the Massachusetts Port Authority Employees' Retirement System Board (the "Board"). As of January 1, 2016, the Authority's actuarial accrued liability totaled approximately \$596.1 million, and the actuarial value of Plan assets available for Plan benefits was approximately \$549.1 million.

In June 2012, GASB issued Statement No. 68, Accounting and Financial Reporting for Pensions ("GASB 68") which sets forth new standards that modify the accounting and financial reporting of the Authority's pension obligations, effective June 30, 2015. The Authority adopted GASB 68 on June 30, 2015. This Statement requires governments, similar to the Authority, that participate in defined benefit pension plans to report a net pension liability or asset in their statement of net position. The net pension liability or asset is the difference between the total pension liability (the present value of projected benefit payments to employees based on their past service) and the assets (mostly investments reported at fair value) set aside in a trust and restricted to paying benefits to current

employees, retirees and their beneficiaries. Additionally, the standard requires immediate recognition of annual service cost and interest on the pension liability and immediate recognition of the effect on the net pension liability of changes in benefit terms. Other components of pension expense will be recognized over a closed period that is determined by the average remaining service period of the plan members (both current and former employees, including retirees). These other components include the effects on the net pension liability of (a) changes in the economic and demographic assumptions used to project benefits and (b) differences between those assumptions and actual experience. Lastly, the effects on the net pension liability of differences between expected and actual investment returns will be recognized in pension expense over a closed five year period. In accordance with GASB 68, the Authority's total pension liability was approximately \$651.9 million and the Plan's fiduciary net position was approximately \$563.6 million as of December 31, 2016, resulting in a net pension liability of \$88.3 million, as compared to \$91.9 million as of December 31, 2015. The Authority's pension expense in fiscal year 2017 is approximately \$19.7 million, as compared to approximately \$15.6 million for fiscal year 2016. See Note 6 and the Required Supplementary Information to the Financial Statements in APPENDIX B to the Official Statement for additional information regarding the Plan.

**Other Post-Retirement Employee Benefits.** The Authority extends other post-retirement benefits ("*OPEB*") to its employees as provided under the Enabling Act and Chapter 32A of the Massachusetts General Laws. In June 2008, the Authority established an irrevocable trust (an "*OPEB Trust*") to partially fund the projected accrued liability for other post-retirement benefits. Prior to the establishment of the OPEB Trust, the Authority funded other post-retirement benefits exclusively on a pay-as-you-go basis. As of the January 1, 2016 valuation (the most recent one available), the Authority's Actuarial Accrued Liability ("*AAL*") for OPEB was approximately \$253.3 million, and the actuarial value of assets held by the OPEB Trust was \$149.8 million or 59.1% of this AAL, resulting in an unfunded AAL of approximately \$103.5 million, as compared to approximately \$88.6 million as of the prior year. The Authority's OPEB expense in fiscal year 2017 is approximately \$17.9 million, as compared to approximately \$14.1 million for fiscal year 2016. See Note 7 and the Required Supplementary Information to the Financial Statements in APPENDIX B to the Official Statement for additional information regarding the Authority's OPEB obligations.

**Payments in Lieu of Taxes.** The Enabling Act authorizes and directs the Authority, subject to certain standards and limitations, to enter into agreements to make annual payments in lieu of taxes to the Cities of Boston and Chelsea and the Town of Winthrop. In accordance with the Transportation Reform Act, as of January 1, 2010, the portion of the Authority's in-lieu-of-tax payment obligations to the City of Chelsea attributable to the Tobin Bridge was assumed by MassDOT. The Enabling Act, the 1978 Trust Agreement and the payment in lieu of tax agreements provide that the payments under these agreements for any fiscal year may not exceed the balance of revenues remaining for such fiscal year after payment of debt service and required reserve account deposits on outstanding Bonds, payment of operating expenses and payment of required deposits to the Maintenance Reserve Fund. See Note 10 to the Financial Statements in APPENDIX B to the Official Statement.

Pursuant to the terms of the amended payment in-lieu-of-taxes agreement between the Authority and the City of Boston (the "*Boston PILOT Agreement*"), the Boston PILOT Agreement terminates on June 30, 2022; provided, however, that absent an annual election by either party to terminate the Boston PILOT Agreement, the term is subject to automatic one-year extensions of the term on each July 1. In November 2016, the City of Boston notified the Authority of its election to terminate the Boston PILOT Agreement on June 30, 2022, and the parties expect to commence negotiations on a successor agreement or an amendment to the existing agreement. The Boston PILOT Agreement provides for the Authority to pay: (i) an annual base amount (the "*Base Amount*") of \$14.0 million, which, commencing in fiscal year 2007, increases annually by the annual percentage change in the consumer price index, provided that such increase shall be no less than 2.0%, nor greater than 8.0%, per year, and (ii) for ten years ending in fiscal year 2016, an amount of \$700,000, which shall not be increased or adjusted.

In fiscal year 2006, the Authority and the Town of Winthrop entered into an Amended and Restated Payment-In-Lieu-Of-Taxes Agreement (the "*Winthrop PILOT Agreement*"), which extended the base in-lieu-of-tax payments through fiscal year 2025. The Winthrop PILOT Agreement provides for the Authority to make an annual payment of \$900,000.

## **Risk Management**

Under the 1978 Trust Agreement the Authority is required to maintain insurance substantially in compliance with the recommendations of the Risk Management Consultant. See APPENDIX E to the Official Statement – Summary of Certain Provisions of the 1978 Trust Agreement – Insurance. The Authority maintains a program of risk management designed to afford insurance protection meeting the requirements of the 1978 Trust Agreement and of sound business practice at the best available cost. The Authority’s insurance program includes coverages from domestic and international insurance markets. The program also includes a reserve held in the Self-Insurance Account designed to fund deductibles and self-insurance of certain risks. The Authority is a legislatively mandated self-insurer for its workers’ compensation risk. The self-insurance program is administered with assistance from a third party administrator and losses are funded through a dedicated Self-Insurance Account within the Operating Fund under the 1978 Trust Agreement (the “Self-Insurance Account”).

The Authority’s risk management program is designed to provide an appropriate level of protection against catastrophic loss, including direct damage to its Projects, loss of revenue and third party legal liability obligations. The program utilizes a combination of purchased insurance and the Self-Insurance Account to provide this level of protection. The principal areas of risk exposure covered by self-insurance are: insurance policy deductibles, workers’ compensation self-insured retention, uninsurable risks (e.g., flood above \$250.0 million and certain environmental pollution), directors’ and officers’ liability and excess liability.

Prior to September 11, 2001, the Authority’s liability insurance and property insurance policies provided coverage for acts of war and terrorism. On November 26, 2002, President Bush signed into law the Terrorism Risk Insurance Act of 2002 (“*TRIA*”). *TRIA* effectively nullified all existing exclusions for acts of terrorism carried out by foreign terrorists. All insured entities covered by *TRIA* were given the opportunity to continue this coverage upon payment of an additional premium quoted by underwriters. Following the recommendations of the Authority’s Risk Management Consultant, the Authority has obtained terrorism insurance under either *TRIA*, where available and not cost prohibitive, or by purchasing coverage under a War Risk buy back option.

The Authority maintains a Self-Insurance Account to cover all areas of self-insurance. See APPENDIX E to the Official Statement – Summary of Certain Provisions of the 1978 Trust Agreement – Insurance. As of March 31, 2017, the fund balance in the Self-Insurance Account was \$31.2 million. Annual contributions, consistent with the recommendations of the Authority’s Risk Management Consultant, are made to this account as part of the Authority’s annual budget process. Losses within the self-insurance area are administered by Authority personnel, use of outside adjusters on a case specific basis and a third-party administrator for workers’ compensation losses. The Authority’s most recent annual Risk Management Assessment Report states that the extent of the Authority’s funding of future liabilities within the Self Insurance Account represents what the Authority’s Insurance Consultant considers to be a “best practice” among complex public agencies. Workers’ compensation losses and losses within the retained layer are predictable and level over time which makes this an appropriate area for risk retention. The report also notes that the combination of internal administration and third-party administration of self-insured claims is sound and cites a demonstrated reduction in loss adjustment expenses, particularly, in the general liability and workers’ compensation areas.

Insurance markets are cyclical. The Authority believes that its proactive risk management program is critical in its effort to contain cost and will continue to yield better results than alternative approaches.

## **Investment Policy**

All investments of Authority funds are made in accordance with the provisions of the 1978 Trust Agreement, the PFC Trust Agreement or the CFC Trust Agreement and the investment policy adopted in 2000 (and most recently updated in June 2016) by the Authority (the “*Investment Policy*”). The goals of the Investment Policy, in order of importance, are: (1) to preserve capital, (2) to provide liquidity to meet payment obligations, and (3) to generate investment income. As authorized by the Investment Policy, the Investment Oversight Committee, chaired by the Director of Administration and Finance of the Authority, oversees the Authority’s investments. The Investment Oversight Committee has established diversification requirements for its investments. The Investment Oversight Committee meets quarterly and determines the general strategies for investment activities and monitors investment results against external benchmarks.

## Financial Hedge Policy

In October 2004, the Members of the Authority approved a formal Financial Hedging Policy, which provides general guidelines regarding the use, procurement and execution of all interest rate swaps, options, caps, collars and related financial transactions (“*Financial Hedges*”) by the Authority. No Financial Hedge may be executed without the approval of the Members of the Authority and review by the State Finance and Governance Board. Prior to seeking the approval of the Authority of any proposed Financial Hedge, the Investment Oversight Committee must undertake an identification and evaluation of the financial benefits and risks involved in the Financial Hedge transaction, including certain enumerated risks, and summarize them for the Members of the Authority. Financial Hedges may not be entered into for speculative purposes, where the Authority does not have sufficient liquidity to terminate an existing Financial Hedge at current market values, or where there is insufficient price transparency to permit reasonable valuation of the Financial Hedge. Counterparty exposure may not exceed prudent limits, and only entities rated “A” or better (or guarantors of such entities) may be counterparties. Financial Hedges are to be used only to lower the cost of the Authority’s borrowing; to reduce exposure to changes in interest rates; or to manage the Authority’s credit exposure to existing Financial Hedge counterparties. Currently, the Authority has no outstanding Financial Hedges.

## LEGISLATIVE DEVELOPMENTS

From time to time legislation has been introduced in the Massachusetts Legislature for the purpose of altering the responsibilities of the Authority, reducing its independence, limiting its planning and operations, taxing its commercial tenants directly, or requiring it to make payments to other governmental entities in the Commonwealth.

In addition, the Authority is subject to state and federal laws of general application, changes to which could have a material effect on the operations or financial position of the Authority. See “AVIATION INDUSTRY CONSIDERATIONS” and “GENERAL OPERATIONAL FACTORS.”

## LITIGATION

No litigation is pending or, to the knowledge of the Authority, threatened against or affecting the Authority seeking to restrain or enjoin the issuance, sale or delivery of the 2017 Bonds or in any way contesting or affecting the validity of the 2017 Bonds.

On September 11, 2001, terrorists hijacked American Airlines Flight 11 and United Airlines Flight 175 and flew them into the World Trade Center in New York, New York. The terrorist acts caused the deaths of approximately 3,000 persons, unknown numbers of personal injuries, and massive property damage. Both flights originated at Logan Airport.

In September 2001, Congress passed the Air Transportation Safety and System Stabilization Act, as amended (“*ATSSSA*”), which provides, among other things, a limitation on liability of various entities, including airport sponsors such as the Authority, for the events of September 11, 2001. Specifically, the liability of an airport sponsor for those events “shall not be in an amount greater than the limits of liability insurance coverage maintained by that ... airport sponsor.” The Authority has insurance in effect to cover these incidents in the amount of \$500,000,000 per occurrence, and consequently, under ATSSSA, the Authority’s liability, if any, would be limited to such amounts. To the Authority’s knowledge, the Authority’s insurer has received copies of all complaints and Notices of Claim and/or any other form of notification to the Authority by an individual or entity claiming to have suffered a loss. Furthermore, to the Authority’s knowledge, its insurer has agreed to defend any such claims and has not reserved its rights to deny coverage with respect to any of those claims, although the insurer has reserved its rights with respect to: (i) the number of occurrences, (ii) indemnification of the Authority against any award of punitive damages, and (iii) the Authority’s rights as a named additional insured under other policies of insurance, including policies of the Authority’s tenants and licensees.

On July 18, 2013, the United States District Court for the Southern District of New York dismissed the remaining property damage claims by World Trade Center Properties, LLC and related entities (“*WTCP*”), on the



grounds that their insurance recoveries following the terrorist acts exceeded the loss in the market value of WTCP's leasehold interest in the World Trade Center complex. WTCP appealed this ruling to the United States Court of Appeals for the Second Circuit, and on September 17, 2015, the Second Circuit vacated the judgment in part and remanded the case to the District Court to recalculate the loss in value of WTCP's leasehold interest. On December 1, 2015, the Second Circuit denied WTCP's petition requesting an en banc hearing, asking for reconsideration of the issues reviewed by the Second Circuit as described above. The case is ongoing in the District Court. While the Authority cannot predict the outcome of this litigation, it believes it has meritorious defenses to these actions and will continue to review and assess the various claims asserted. All other wrongful death and property damage lawsuits against the Authority and other defendants have been settled or dismissed. These settlements have been achieved without any financial contribution from the Authority or its insurer, though the settling plaintiffs have provided the Authority with a release of all claims.

The Authority also is engaged in other litigation. These routine matters include personal injury and property damage claims for which the Authority's liability is covered in whole or in part by insurance. Others include such matters as disputes with employees; disputes with contractors, subcontractors, engineers and others arising out of construction and maintenance of its properties; disputes over leases and concessions; eminent domain disputes; and property, theft and damage claims arising from the Authority's parking operations, as to which the Authority is self-insured. The Authority does not expect that these matters will require any amounts to be paid that, singly or in the aggregate, will have a material effect on the operations or financial position of the Authority.

[End of Information Statement of the Authority.]

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**MASSACHUSETTS PORT AUTHORITY**

Financial Statements, Required Supplementary Information, and  
Supplementary Schedules

Years Ended June 30, 2016 and 2015

(With Report of Independent Auditors)

# MASSACHUSETTS PORT AUTHORITY

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## **Report of Independent Auditors**

### **To the Members of the Massachusetts Port Authority**

We have audited the accompanying financial statements of the Massachusetts Port Authority (the Authority), as of and for the years ended June 30, 2016 and 2015, and the related notes to the financial statements, which collectively comprise the Authority's basic financial statements as listed in the table of contents.

### ***Management's Responsibility for the Financial Statements***

Management is responsible for the preparation and fair presentation of these financial statements in conformity with U.S. generally accepted accounting principles; this includes the design, implementation, and maintenance of internal control relevant to the preparation and fair presentation of financial statements that are free of material misstatement, whether due to fraud or error.

### ***Auditor's Responsibility***

Our responsibility is to express an opinion on these financial statements based on our audits. We conducted our audits in accordance with auditing standards generally accepted in the United States. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. Accordingly, we express no such opinion. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of significant accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

### ***Opinion***

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Massachusetts Port Authority as of June 30, 2016 and 2015, and the changes in financial position and cash flows for the years then ended in conformity with U.S. generally accepted accounting principles.



### ***Required Supplementary Information***

U.S. generally accepted accounting principles require that management's discussion and analysis, the schedule of OPEB funding progress, the schedule of pension contributions and the schedule of changes in the net position liability and related ratios, as listed in the table of contents, be presented to supplement the basic financial statements. Such information, although not a part of the basic financial statements, is required by the Governmental Accounting Standards Board which considers it to be an essential part of financial reporting for placing the basic financial statements in an appropriate operational, economic or historical context. We have applied certain limited procedures to the required supplementary information in accordance with auditing standards generally accepted in the United States, which consisted of inquiries of management about the methods of preparing the information and comparing the information for consistency with management's responses to our inquiries, the basic financial statements, and other knowledge we obtained during our audit of the basic financial statements. We do not express an opinion or provide any assurance on the information because the limited procedures do not provide us with sufficient evidence to express an opinion or provide any assurance.

### ***Supplementary Information***

Our audit was conducted for the purpose of forming an opinion on the financial statements that collectively comprise the Authority's basic financial statements. The supplementary schedules, as listed in the table of contents, are presented for purposes of additional analysis and are not a required part of the basic financial statements. The supplementary schedules are the responsibility of management and were derived from and relates directly to the underlying accounting and other records used to prepare the basic financial statements. Such information has been subjected to the auditing procedures applied in the audit of the basic financial statements and certain additional procedures, including comparing and reconciling such information directly to the underlying accounting and other records used to prepare the basic financial statements or to the basic financial statements themselves, and other additional procedures in accordance with auditing standards generally accepted in the United States. In our opinion, the information is fairly stated, in all material respects, in relation to the basic financial statements as a whole.

*Ernst + Young LLP*

September 30, 2016

# MANAGEMENT'S DISCUSSION AND ANALYSIS

## Introduction and Summary

The following discussion and analysis of the activities and financial performance of the Massachusetts Port Authority (the Authority) provides an introduction to the financial statements of the Authority for the fiscal years ended June 30, 2016, 2015 and 2014. This discussion was prepared by management, and it should be read in conjunction with the audited financial statements and notes that follow this section. Management has established and maintains certain internal controls and procedures designed to ensure that the annual financial statements are free from material misstatement and that all required disclosures are made in its annual financial statements.

The Authority owns Logan International Airport (Logan Airport), Hanscom Field, Worcester Regional Airport (Worcester Airport), Conley Terminal, Raymond L. Flynn Cruiseport at Black Falcon Terminal and various other maritime properties (the Port). The Authority has no taxing power and is not taxpayer funded. As a self-sustaining entity, the Authority relies on revenues collected from airline fees, parking fees, terminal, ground and other rents, concessions, and other fees to fund operating expenses. The Authority's operating revenues along with federal grants, passenger facility charges (PFCs), and customer facility charges (CFCs) fund its capital expenditures. The Authority issues revenue bonds that are secured solely by the Authority's revenues, as defined by the 1978 Trust Agreement, the PFC Trust Agreement and the CFC Trust Agreement, respectively. The Authority's bonds do not constitute a debt or a pledge of the full faith and credit of the Commonwealth of Massachusetts or of any other political subdivision thereof. The Authority also receives Federal and State grants for specific capital projects.

## Overview of the Financial Statements

The Authority's financial statements consist of: (1) the Statements of Net Position; (2) the Statements of Revenues, Expenses and Changes in Net Position; and (3) the Statements of Cash Flows. These financial statements have been prepared in accordance with U.S. generally accepted accounting principles as promulgated by the Governmental Accounting Standards Board (GASB).

The comparative Statements of Net Position depict the Authority's financial position as of a point in time, specifically June 30, 2016, and 2015, and include all assets, deferred outflows, liabilities and deferred inflows of the Authority. Net position represents the residual interest in the Authority's assets and deferred outflows after liabilities and deferred inflows are deducted. The Authority's net position is divided into three components: 1) net investment in capital assets, 2) restricted, and 3) unrestricted. Please see Note 1 in the financial statements attached hereto for a discussion on the Authority's net position.

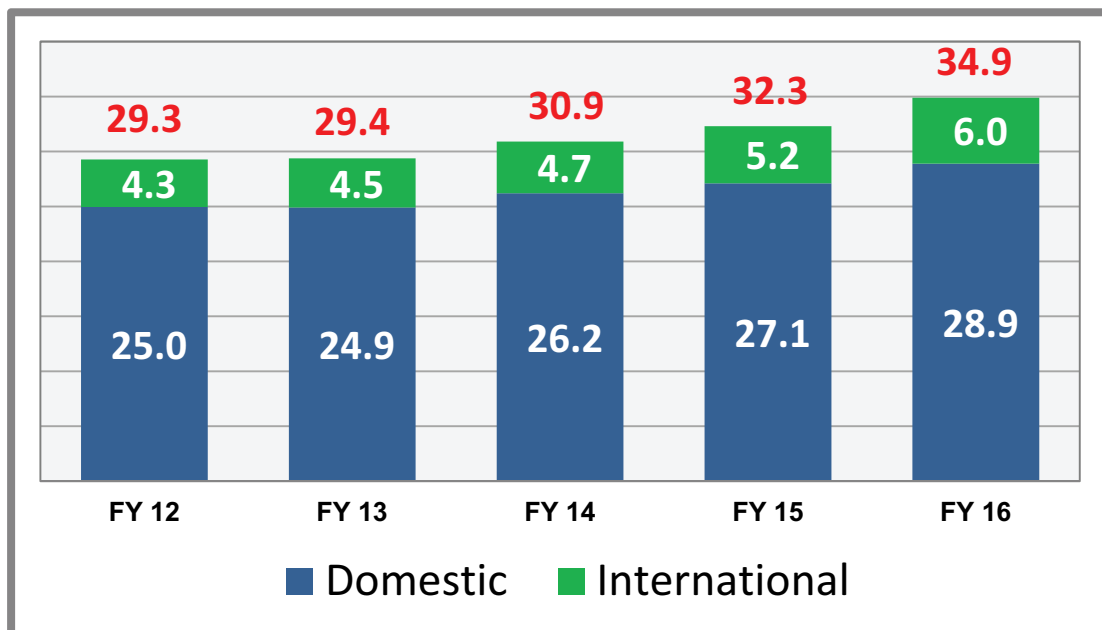
The Statements of Revenues, Expenses and Changes in Net Position report operating revenues, operating expenses, non-operating revenue and expenses, and other changes in net position. Revenues and expenses are categorized as either operating or non-operating based upon management’s policies as established in accordance with definitions set forth by the GASB. Certain sources of the Authority’s revenues, including PFCs, CFCs, investment income and capital grants are reported as non-operating revenues, and their uses are restricted and generally are not available for operating purposes.

The Statements of Cash Flows present information showing how the Authority’s cash and cash equivalents changed during the fiscal year. The Statements of Cash Flows classify cash receipts and cash payments resulting from operating activities, capital and related financing activities, and investing activities.

## Business Activity Highlights

- Logan Airport Sets New Record Serving Nearly 35 million Passengers.** Logan Airport set another passenger record in fiscal year 2016 by serving 34.9 million passengers, an increase of 2.6 million passengers or 8.0% compared to fiscal year 2015. Growth reflected increases in both domestic and international passengers as existing carriers added more seats and several new international airlines began service. The 2016 growth represented a continuation of the upward trend Logan Airport has experienced over the last several years.

### LOGAN INTERNATIONAL AIRPORT Passengers Served (Millions)





**Logan Airport Domestic Passengers Increased 1.8 Million or 6.7%** – Total domestic passenger activity rose to 28.9 million passengers. Passenger growth was fueled by low cost carriers as JetBlue, Southwest, and Spirit Airlines accounted for nearly two-thirds of the increase. JetBlue Airways passenger volume increased by nearly 500,000, which produced 1.8% of the 6.7% increase. Approximately 375,000 more passengers flew on Southwest Airlines, which contributed 1.4% towards Logan Airport's 6.7% increase. Finally, close to 275,000 more passengers travelled on Spirit Airlines as they added new services to/from Logan, which accounted for nearly 1.0% of the 6.7% growth.

**International Passengers Increased 800,000 or 15.1%** - International passenger activity rose to nearly 6.0 million passengers during the fiscal year. Passenger growth was driven by the full year impact in fiscal year 2016 of service that began during 2015, the addition of routes by existing international airlines, and by new international airlines that began service during 2016. Seven new international airlines that began serving Logan Airport in 2016 contributed approximately 180,000 new passengers. These airlines and their routes are listed below:



Copenhagen



Doha



Lisbon



London - Gatwick  
Oslo  
Copenhagen



Cologne/Bonn



Dusseldorf

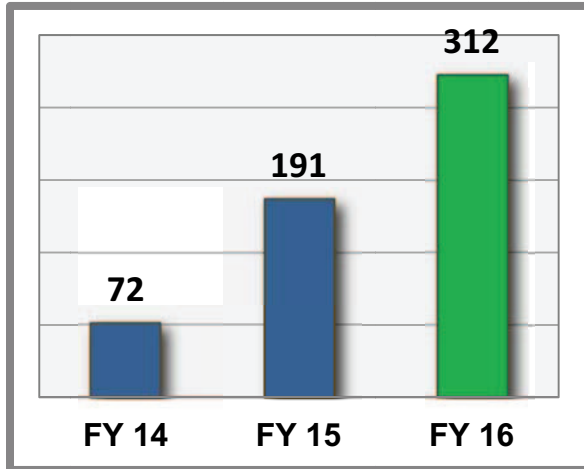


Manchester

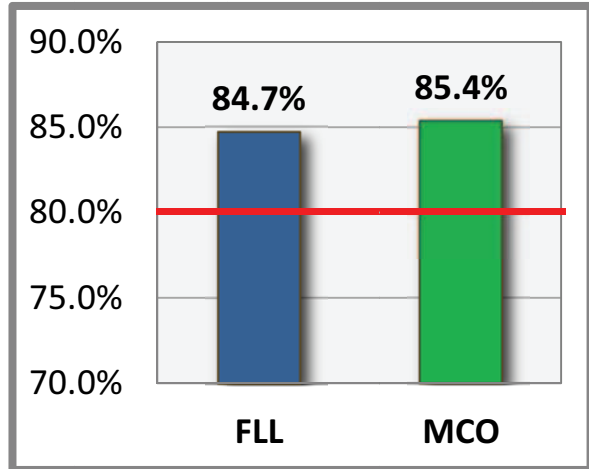
- **Worcester Regional Airport Has Served 312,000 Cumulative Passengers Since November 2013.** In May of 2016, Worcester Airport served its 300,000<sup>th</sup> passenger since JetBlue Airways commenced service there in November of 2013. JetBlue provides service between Worcester Regional Airport and two popular Florida destinations – Orlando (MCO) and Fort Lauderdale (FLL). Throughout fiscal year 2016, load factors on both routes were consistently in the mid 80% range, indicating strong demand for these services.

## WORCESTER REGIONAL AIRPORT

**CUMULATIVE PASSENGERS  
(thousands)**



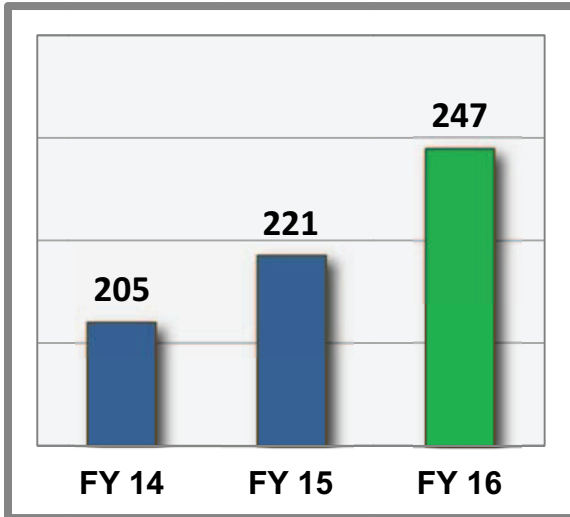
**FY16 PASSENGER LOAD FACTORS  
(vs. 80% Target)**



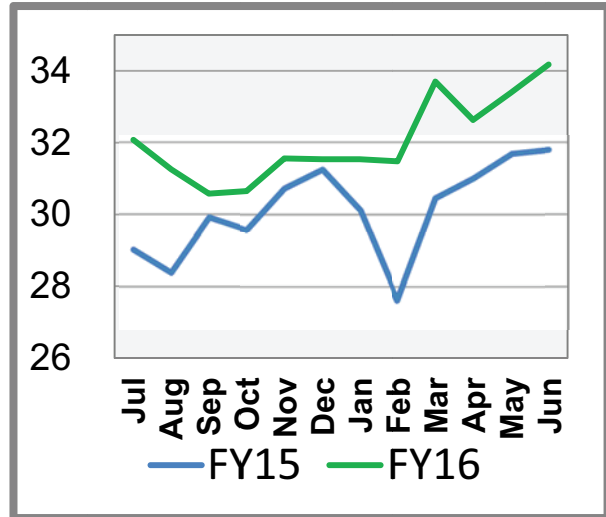
- **Conley Container Volume at All Time High, Largest Ship Calls on Conley Terminal.**  
Conley Terminal surpassed its record breaking year in 2015 by processing a new record of 247,329 TEUs (Twenty-foot Equivalent Units) in fiscal year 2016, a 12.0% increase. Container activity at Conley Terminal benefitted from a strong New England economy coupled with ongoing transshipment of Asian cargo via European ports. Actions taken to improve productivity at the terminal also drove business growth, leading the Journal of Commerce to name Conley Terminal the #1 Port in North America for productivity improvements. Finally, the largest ship to use the terminal, the 8,500 TEU China Shipping Container Lines *Africa*, called on Conley Terminal on April 3, 2016. As a result, other 8,500 TEU sized ships have now been placed in the rotation to call on Conley Terminal.

## CONLEY CONTAINER TERMINAL

**TEUs PROCESSED  
(thousands)**



**PRODUCTIVITY  
Container Lifts/Hour/Crane**



- Disney Cruise Lines Makes First Visit to Cruiseport Boston.** In May of 2016, Disney Cruise Line's *Disney Magic* called on the Raymond L. Flynn Cruiseport at Black Falcon Terminal. This was the first time a Disney ship called on Boston, and shows that Massport's cruise business is having success attracting new lines and itineraries. Also in May of 2016, Royal Caribbean's *Anthem of the Seas*, the largest cruise ship to call on Boston, visited the Cruiseport. This massive ship is over 1,100 feet long and can accommodate nearly 5,000 passengers.
- Safety/Security Remains Massport's Top Priority.** By the end of June 2016, the Authority had completed the majority of work related to the installation of an enhanced Checked Baggage Inspection System (CBIS). This \$216 million system will soon be deployed at all Logan Airport terminals, and will improve the checked baggage handling process through the use of state-of-the-art bag screening technology that will replace the first generation bag screening technology deployed shortly after the September 11, 2001 terrorist event. The new system will also increase the efficiency and speed of baggage processing at Logan Airport.

Also in 2016, Massport conducted an Airport Facility Emergency Response Vulnerability Assessment and Training initiative. This included safety and security reviews of all major Massport facilities, which resulted in items such as hardening of entry/egress

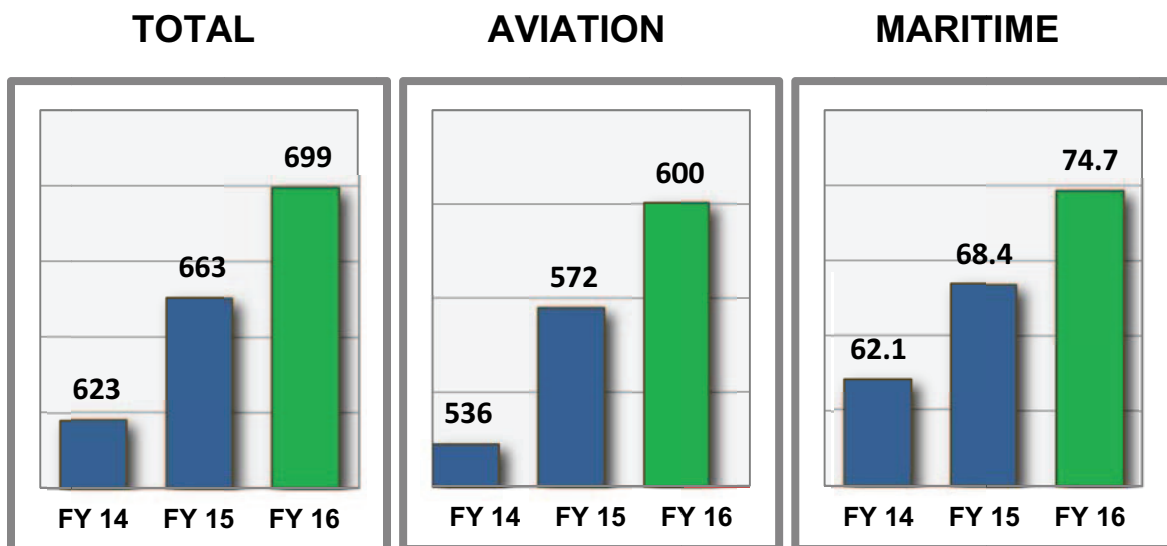
areas, installation of cameras, and other such measures to strengthen security protocols. It also included the first of its kind “active shooter” drills to prepare Massport safety and security personnel for such an incident. An active shooter drill was also held on the Queen Mary II in the spring of 2016 when it was docked at Flynn Cruiseport in Boston.

Finally, Massport holds detailed Security Briefings each morning at Logan Airport. These briefings are attended by Massport staff as well as representatives from the FBI, state and local police, all airport-based federal agencies (FAA, TSA and CBP) and the station managers from the airlines serving the airport. Logan is the only airport in the country that has been holding these Security Briefings on a daily basis since September 11, 2001, which underscores the fact that protecting our customers is of paramount importance.

## Financial Highlights

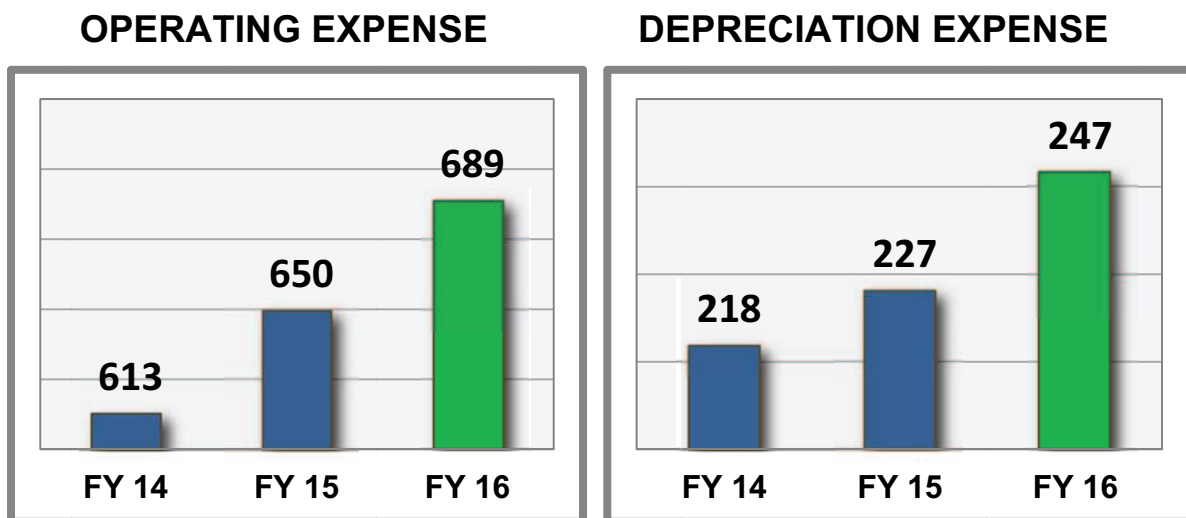
- **Operating Revenues of \$699 Million, Up \$37 million.** Record business volumes at Logan Airport and Conley Terminal resulted in an increase in Aviation Revenues of \$27.9 million or 4.9% and an increase in Maritime Revenues of \$6.3 million or 9.2% in fiscal year 2016 versus prior year. Real Estate Revenues also grew by \$2.4 million or 10.9%.

### OPERATING REVENUES (\$ Millions)



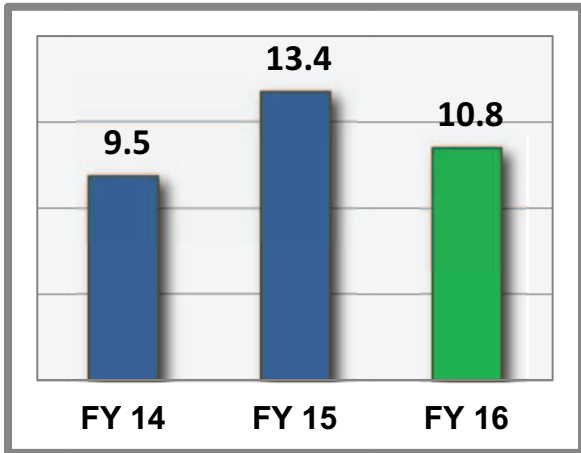
- Operating Expenses of \$689 Million, Up \$39 million.** Fiscal year 2016 operating expense growth was driven by increases to depreciation expense associated with new investment in the Authority's assets, higher business volume in terms of passenger and container activity, and higher employee pension and retiree health care expenses resulting from lower investment returns on plan assets set aside to fund these long term obligations. Depreciation expense increased by \$20.3 million or 8.9% due in part to a \$13.1 million one-time charge against the residual unamortized value of Logan Airport's legacy baggage screening system, which is being replaced with the new in-line checked baggage inspection system at Logan Airport. Pension and other post-employment benefits expenses increased by \$14.9 million or 101% due to a reduction to the discount rate to 7.25% for both plans as well as current year investment returns on pension and OPEB funds that did not reach their actuarial benchmark.

## OPERATING and DEPRECIATION EXPENSES (\$ Millions)

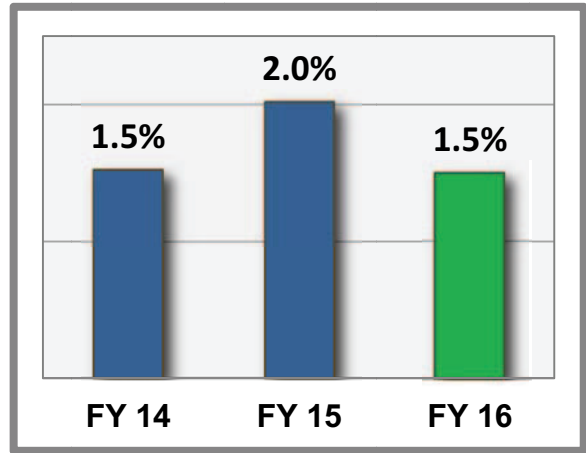


- Operating Income and Margin Consistent with 2015.** The Authority's operating income of \$10.8 million in fiscal year 2016 was slightly lower than the \$13.4 million of income for 2015. The operating income margin of 1.5% for 2016 was just below the 2.0% margin in 2015 as growth in operating expenses was higher than the increase in operating revenues. Factors contributing to the decline in the Authority's operating income include the \$13.1 million one-time charge related to the Logan Airport baggage system and \$14.9 million increase in pension and retiree health care benefits expense.

## OPERATING INCOME (\$ Millions)



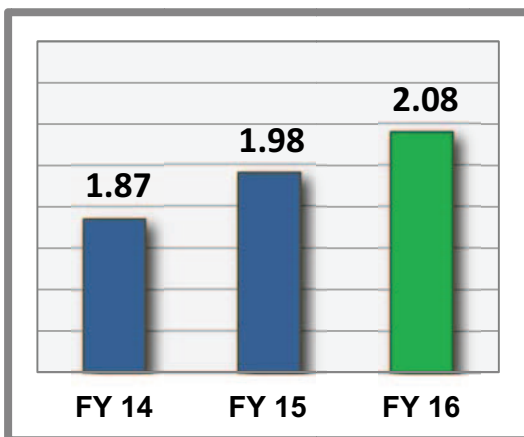
## OPERATING MARGIN



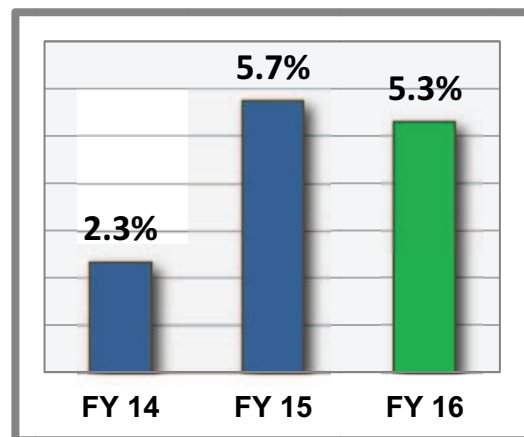
- Net Position Increases by 5%.** The Authority's net position increased by \$105.3 million or 5.3% to \$2.08 billion versus \$1.98 billion in fiscal year 2015. Growth was due to operating income of \$10.8 million, income from non-operating activities that include Passenger Facility Charge revenues from ticket sales and Customer Facility Charge revenues from rental car daily transactions of \$38.5 million, and \$56.0 million in capital grant revenues used for facility improvements. Net Position is a key indicator of the financial health of the Authority, and this metric has gradually increased over the last few years due to healthy business activity and strong fiscal policies.

## NET POSITION

### AMOUNT (\$ Billions)



### ANNUAL % INCREASE



- **\$376 million Investment in Capital Assets in FY2016.**

1. Expansion of Logan Airport Central Parking Garage – The Authority completed construction in November of 2015 of an additional 1,700 parking spaces at the Logan Airport Central Garage. Another 350 lined spaces were added on other property at Logan Airport.
2. Terminal C to E Connector at Logan Airport – This project was completed in June of 2016 and created a post-security public corridor connecting Terminal C to Terminal E. The new connector includes expanded hold rooms, new restrooms, and new concession areas. This corridor is also being used to feature exhibits that showcase the region to travelers, and focuses on innovative Massachusetts individuals and institutions responsible for breakthroughs in science, technology, sports, culture and civic life.
3. Terminal E Renovations and Enhancements – In order to support international growth and aircraft such as the Airbus 380, the largest aircraft in commercial service with seating capacity for over 500 passengers, the Authority is reconfiguring and expanding space at Logan Airport Terminal E. In addition to interior and exterior work to accommodate the larger aircraft, the project also entails expanding the security checkpoint area and adding a third level space for an airline club. Project completion is scheduled for late 2016/early 2017.

- **Massport’s Strong Bond Rating Affirmed.** Near the end of fiscal year 2015, both Moody’s and Standard & Poor’s increased the Authority’s credit rating for its revenue bonds to Aa2 and AA, respectively, while Fitch affirmed its AA rating. This gave Massport the status of the highest rated airport in the country in terms of credit rating based on the evaluations by Moody’s, Standard & Poor’s and Fitch. In July of 2015, the Authority issued \$171.5 million of revenue bonds to fund the five-year Capital Program. In July of 2016, the Authority’s credit ratings were affirmed by the credit rating agencies and \$230 million of revenue bonds were issued to meet the capital needs of the Authority. Massport continues to enjoy its favorable credit ratings, which are important as they keep borrowing costs low, which benefits the customers and our airline partners who rely on our facilities to provide high levels of customer service to the travelling public.

<b><u>RATING AGENCY</u></b>	<b><u>RATING</u></b>	<b><u>OUTLOOK</u></b>
<b>MOODY’S</b>	<b>Aa2</b>	<b>STABLE</b>
<b>STANDARD and POOR’S</b>	<b>AA</b>	<b>STABLE</b>
<b>FITCH</b>	<b>AA</b>	<b>STABLE</b>

**Condensed Statement of Revenues, Expenses and Changes in Net Position**  
(in millions)

	FY 2016	FY 2015	\$ Change	% Change
Operating revenues	\$ 699.5	\$ 662.9	\$ 36.6	5.5%
Operating expenses including depreciation and amortization	688.7	649.5	39.2	6.0%
<b>Operating income</b>	<b>10.8</b>	<b>13.4</b>	<b>(2.6)</b>	<b>-19.4%</b>
Total non-operating revenues (expenses), net	38.5	38.1	0.4	1.0%
Capital grant revenues	56.0	56.0	0.0	0.0%
<b>Increase (decrease) in net position</b>	<b>105.3</b>	<b>107.4</b>	<b>(2.1)</b>	<b>-2.0%</b>
Net position, beginning of year	1,978.6	1,871.2	107.4	5.7%
<b>Net position, end of year</b>	<b>\$ 2,083.9</b>	<b>\$ 1,978.6</b>	<b>\$ 105.3</b>	<b>5.3%</b>

	FY 2015	FY 2014 (restated)	\$ Change	% Change
Operating revenues	\$ 662.9	\$ 622.5	\$ 40.4	6.5%
Operating expenses including depreciation and amortization	649.5	613.0	36.5	6.0%
<b>Operating income</b>	<b>13.4</b>	<b>9.5</b>	<b>3.9</b>	<b>41.1%</b>
Total non-operating revenues (expenses), net	38.1	35.5	2.6	7.3%
Capital grant revenues	56.0	56.1	(0.1)	-0.2%
<b>Increase (decrease) in net position</b>	<b>107.4</b>	<b>101.1</b>	<b>6.3</b>	<b>6.2%</b>
Net position, beginning of year	1,871.2	1,770.1	101.1	5.7%
<b>Net position, end of year</b>	<b>\$ 1,978.6</b>	<b>\$ 1,871.2</b>	<b>\$ 107.4</b>	<b>5.7%</b>

Note: Fiscal year 2014 results were restated to conform to GASB No. 68 standards for reporting pension costs.

Detailed descriptions of operating revenues and expenses, and non-operating revenues and expenses are described in the following sections.

## OPERATING REVENUES

The Authority's operating revenues for fiscal year 2016 were \$699.5 million, an increase of \$36.6 million or 5.5% over fiscal year 2015. This growth was mainly due to an increase in passengers at Logan Airport, higher container volume at Conley Terminal, and additional ground rent and parking fee revenues earned on properties the Authority owns in South Boston and East Boston.

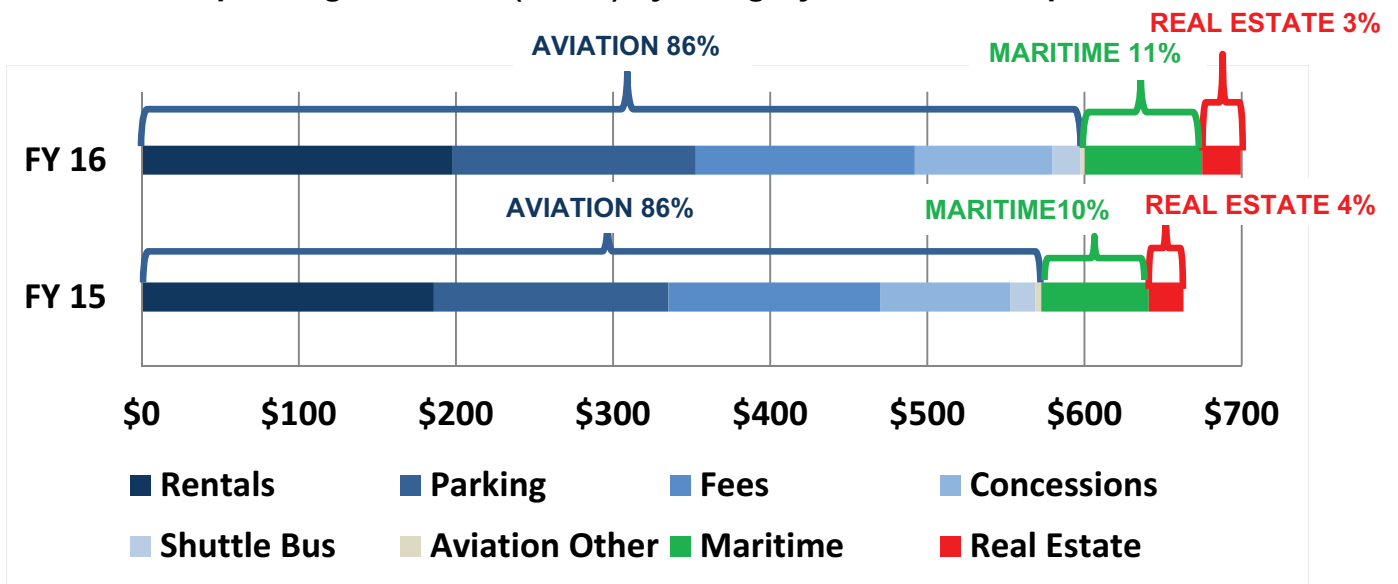


### Operating Revenues (in millions)

	FY 2016	FY 2015	\$ Change	% Change
Aviation Rentals	\$ 198.1	\$ 186.0	\$ 12.1	6.5%
Aviation Parking	154.6	149.2	5.4	3.6%
Aviation Fees	139.4	135.0	4.4	3.3%
Aviation Concessions	87.4	82.7	4.7	5.7%
Shuttle Bus	18.0	15.7	2.3	14.6%
Aviation Operating Grants and Other	2.8	3.9	(1.1)	-28.2%
<b>Total Aviation Revenues</b>	<b>\$ 600.3</b>	<b>\$ 572.4</b>	<b>\$ 27.9</b>	<b>4.9%</b>
Maritime Fees, Rentals and Other	74.7	68.4	6.3	9.2%
Real Estate Fees, Rentals and Other	24.5	22.1	2.4	10.9%
<b>Total</b>	<b>\$ 699.5</b>	<b>\$ 662.9</b>	<b>\$ 36.6</b>	<b>5.5%</b>

	FY 2015	FY 2014	\$ Change	% Change
Aviation Rentals	\$ 186.0	\$ 181.0	\$ 5.0	2.8%
Aviation Parking	149.2	136.7	12.5	9.1%
Aviation Fees	135.0	124.7	10.3	8.3%
Aviation Concessions	82.7	77.8	4.9	6.3%
Shuttle Bus	15.7	12.3	3.4	27.6%
Aviation Operating Grants and Other	3.9	3.8	0.1	2.6%
<b>Total Aviation Revenues</b>	<b>\$ 572.4</b>	<b>\$ 536.3</b>	<b>\$ 36.1</b>	<b>6.7%</b>
Maritime Fees, Rentals and Other	68.4	62.2	6.2	10.0%
Real Estate Fees, Rentals and Other	22.1	24.0	(1.9)	-7.9%
<b>Total</b>	<b>\$ 662.9</b>	<b>\$ 622.5</b>	<b>\$ 40.4</b>	<b>6.5%</b>

### Operating Revenues (\$ Mills) by Category and % of Massport Total



## AVIATION REVENUES

### ***Fiscal Year 2016 Compared to 2015***

The Authority's aviation revenues are derived from its three airport facilities: Logan Airport, Hanscom Field and Worcester Regional Airport. The Authority earned \$600.3 million in revenues from its aviation operations in fiscal year 2016.

### **Aviation Revenues (*in millions*)**

	FY 2016	FY 2015
Logan	\$ 586.5	\$ 558.8
Hanscom	12.2	12.1
Worcester	1.6	1.6
<b>Total</b>	<b>\$ 600.3</b>	<b>\$ 572.4</b>

### **Logan Airport Revenues**

Logan Airport generated \$586.5 million in revenues in fiscal year 2016, a \$27.7 million, or 5.0% increase over last year due to a record-breaking 34.9 million passengers.

### **Logan Airport Revenues (*in millions*)**

	FY 2016	FY 2015
Logan Rentals	\$ 191.5	\$ 179.7
Logan Parking	154.1	148.7
Logan Fees	133.7	129.1
Logan Concessions	86.6	81.8
Shuttle Bus	18.0	15.7
Logan Operating Grants and Other	2.6	3.8
<b>Total</b>	<b>\$ 586.5</b>	<b>\$ 558.8</b>

Aviation rentals revenues are earned through terminal building, non-terminal building and ground lease agreements. Revenue from Logan Airport rentals was \$191.5 million and grew by \$11.8 million mainly due to an \$8.3 million increase in terminal rents, which accounts for nearly three-quarters of rental income. This was driven primarily by the increase in international passengers as the airlines pay an arrival and departure fee per passenger to use Terminal E. The other major component of the increase was the recovery of terminal operating and capital costs from the airlines, which is factored into the terminal rental rates.

Aviation parking revenues are primarily generated from the Authority’s on-airport and off-airport parking facilities. During fiscal year 2016, Logan parking collected \$154.1 million in revenues from parking operations, an increase of \$5.4 million or 3.6%. Parking exits at Logan Airport parking facilities increased by 2.5% to 2.7 million compared to the prior year, which contributed to the growth in revenue.

Aviation fees revenues consist of revenues earned from aircraft landing fees, utility reimbursements, and other aviation related fees including aircraft parking. Logan Airport generated \$133.7 million in Logan fees, an increase of \$4.6 million or 3.6% compared to fiscal year 2015. Aviation fees at Logan Airport primarily consist of aircraft landing fees and utility fees in addition to other miscellaneous fees. In fiscal year 2016, the Authority collected \$104.5 million in landing fees from scheduled and non-scheduled airlines based on the landed weight of aircraft serving Logan Airport. The landing fee rate is determined annually based on full cost recovery to maintain and operate the airfield at Logan Airport. The \$3.4 million increase in landing fee revenues resulted from a 9% increase in total landed weight partially offset by a decrease in the weighted average landing fee rates from \$4.87 to \$4.61. The increase in landed weight reflected a 6.4% increase in aircraft operations, a general shift to larger aircraft types as airlines upgraded their fleets, and several new long-haul international services to Logan Airport. Revenues from utility fees decreased by \$0.3 million or 1.6% due to a milder winter and lower energy costs.

**Logan Airport Aviation Fees (*in millions*)**

	FY 2016	FY 2015
Landing Fees	\$ 104.5	\$ 101.1
Utilities	18.0	18.3
Other	11.2	9.7
<b>Total</b>	<b>\$ 133.7</b>	<b>\$ 129.1</b>

Aviation concessions revenues are earned from airport terminal retail operations, on-airport car rental transactions, and the activities of ground transportation and other service providers including taxis, bus, limousine, aircraft ground handling, and in-flight catering. Logan Airport earned \$86.6 million from concessions compared to \$81.8 million in fiscal 2015, an increase of \$4.8 million or 5.9%. During fiscal year 2016, Logan Airport earned \$31.3 million from rental car companies, an increase of \$1.0 million or 3.3%. Strong passenger growth contributed to the increase in rental car revenues as the number of transactions grew by 5.1% from fiscal year 2015. Revenues from in-terminal concessions totaled \$34.0 million, an increase of \$1.4 million or 4.3% compared to the prior year. This increase was mainly due to an 8.9% increase in revenues from food/beverage and retail concessions resulting from the increase in passengers, as well as a 13.0% increase in revenues from customer amenity services such as smart carts. Ground transportation and other concession revenues were \$21.3 million, an increase of \$2.3

million. Fees from ground transportation including buses, limos and taxis increased by \$0.9 million or 10%. Other concession revenues from commercial services and ground servicing increased by \$1.4 million or 17% due to higher levels of passengers and aircraft operations.

**Logan Airport Concession Fees (*in millions*)**

	FY 2016	FY 2015
Rental Car	\$ 31.3	\$ 30.3
In-Terminal	34.0	32.6
Ground Transportation & Other	21.3	19.0
<b>Total</b>	<b>\$ 86.6</b>	<b>\$ 81.9</b>

The Authority also earned \$18.0 million of revenue in fiscal year 2016 related to Logan Airport shuttle bus operations, an increase of \$2.3 million over fiscal year 2015. Shuttle bus operations include an on-airport shuttle that links the terminal buildings, rental car center, and public transit station, as well as the bus operations from four off-airport Logan Express sites in the Boston metropolitan region and Boston’s Back Bay area. Revenues from the on-airport shuttle bus increased by \$0.3 million benefitting from passenger growth. Revenues from the off-airport shuttle bus operations increased by \$1.1 million due to an 8.0% increase in passenger volume. The Authority also recognized \$0.9 million of shuttle bus revenues in fiscal year 2016 related to the Silver Line service operated in partnership with the MBTA, which is used to offset a portion of the \$3.8 million in operating costs paid by the Authority for bus service between Logan Airport and South Station.

During fiscal year 2016, Logan Airport received \$2.6 million in revenues from operating grants compared to \$3.8 million in the prior year. The decrease is mainly attributable to the receipt of a \$1.0 million federal government reimbursement in fiscal year 2015 for expenses related to Hurricane Sandy, which impacted airport operations in October 2012, and the winter storm Nemo in February 2013.

**Logan Airport Shuttle Bus and Other Revenues (*in millions*)**

	FY 2016	FY 2015
Shuttle Bus	\$ 18.0	\$ 15.7
Other	2.8	3.9
<b>Total</b>	<b>\$ 20.8</b>	<b>\$ 19.6</b>

## **Hanscom Field and Worcester Regional Airport Revenues**

During fiscal year 2016, Hanscom Field generated \$12.2 million in revenues, an increase of \$0.1 million or 0.8% compared to the prior year. This was mainly due to higher revenues from hangar rents and fees generated by Rectrix Aviation, which opened a 60,000 square foot hangar at Hanscom Field in fiscal year 2015. Worcester Regional Airport had \$1.6 million in operating revenues in fiscal year 2016, comparable to the prior year.

	<b>FY 2016</b>	<b>FY 2015</b>
Hanscom	\$ 12.2	\$ 12.1
Worcester	1.6	1.6
<b>Total</b>	<b>\$ 13.8</b>	<b>\$ 13.6</b>

### ***Fiscal Year 2015 Compared to 2014***

The Authority earned \$572.4 million in aviation revenues from its operations in fiscal year 2015. Aviation revenues grew by \$36.1 million, or 6.7%, compared to the prior year.

- Revenues from aviation rentals were \$4.9 million or 2.7% higher due to increased airline terminal rents at Logan Airport for the recovery of operating expenses and capital improvements, an expansion of Terminal B, and growth in international passengers arriving in Terminal E.
- Aviation parking revenues grew by \$12.4 million, or 9.1%, primarily from a \$2 increase in parking rates at Logan Airport that went into effect July 1, 2014.
- Revenue from aviation fees increased by \$10.3 million, reflecting an \$8.2 million increase in landing fee revenues at Logan Airport, a \$1.5 million increase in utility reimbursement fees at all the aviation facilities, and a \$0.3 million increase in fuel flowage fees at Hanscom Field.
- Aviation concession revenues grew by \$4.8 million, or 6.2%, mainly as a result of increased passenger activity and airline services at Logan Airport.
- Revenue from the Authority's shuttle bus operations increased by \$3.4 million compared to fiscal year 2014 from a full-year of on-airport shuttle bus operations, a full-year of the Back Bay Shuttle Bus operation, and a 2.4% increase in passengers using shuttle bus services from off-airport Logan Express sites.
- Aviation operating grants and other revenues were \$0.1 million higher than the prior fiscal year.

## MARITIME REVENUES

### ***Fiscal Year 2016 Compared to 2015***

Maritime fees, rentals and other revenues are collected primarily from container shipping lines, cruise ship lines and other customers that use the Authority's Port facilities. The Authority's maritime business includes cargo container ship operations at Conley Terminal, the Raymond L. Flynn Cruiseport at Black Falcon Terminal, rental facilities for seafood processors and commercial parking at the Boston Fish Pier in South Boston, and the Moran Terminal, which houses an automobile import/export facility and other port properties in Charlestown. The Authority collected \$74.7 million in fees, rentals and other income from its maritime operations in fiscal year 2016.

### **Maritime Revenues (in millions)**

	FY 2016	FY 2015
Containers	\$ 59.3	\$ 52.9
Cruise	5.8	6.2
Seafood	5.0	4.7
Autoport	4.6	4.7
<b>Total</b>	<b>\$ 74.7</b>	<b>\$ 68.4</b>

The container business at Conley Terminal generated \$59.3 million in revenues and accounts for 79.4% of total maritime revenues. The Authority collects fees from ocean shipping lines for the loading and unloading of containers at Conley Terminal and for related services through tariffs and contracts with the shipping lines and shippers using the Port. In fiscal year 2016, revenue from container operations increased by \$6.4 million or 12.1% as Conley Terminal processed a record 247,329 TEUs, a 12.0% increase over the prior year.

Revenues from operations at the Raymond L. Flynn Cruiseport were \$5.8 million in fiscal year 2016. The Authority collects per passenger fees as well as dockage, water and equipment rental charges from home-port and port-of-call cruise ships that dock at the Black Falcon Terminal. Fiscal year 2016 cruise revenues declined by \$0.4 million, or 6.5%, from the prior year reflecting a 12.5% decrease in cruise passengers primarily from a reduced number of calls by the Norwegian Cruise Lines' *Norwegian Dawn*, which was in dry dock for part of the cruise season.

Seafood revenues increased to \$5.0 million in fiscal year 2016 from \$4.7 million in fiscal year 2015. Revenues are earned through space and ground rents from seafood processing and office tenants, commissions, utility charges, fees and parking lots at the Fish Pier. The \$0.3 million increase in seafood revenues in fiscal year 2016 is mainly due to a \$0.2 million increase in rental income from higher occupancy rates and a \$0.1 million increase in parking revenue from higher parking demand and a market based rate adjustment. The occupancy rate

for fish processing space at the Fish Pier increased to 94% at the end of fiscal year 2016 from 85% in fiscal year 2015.

The Autoport earned \$4.6 million in fiscal year 2016, a decrease of \$0.1 million versus the prior year. Autoport revenues are earned from ground leases, subtenant percentage rents, commissions on fuel sales and utility reimbursement fees. In fiscal year 2016, revenues from rents increased by \$0.3 million but were offset by a \$0.4 million decrease in utility fee reimbursements due to rent abatement for one of the tenants.

***Fiscal Year 2015 Compared to 2014***

The Authority collected \$68.4 million in fees, rentals and other income from its maritime operations in fiscal year 2015. This was \$6.2 million or 10.0% higher than the prior year.

- Container revenues were higher by \$5.4 million or 11.3% primarily due to a 7.7% increase in container volume at Conley Terminal.
- Seafood and Autoport revenues increased by a combined \$0.9 million primarily due to higher ground lease revenue and utility reimbursements.
- Cruiseport revenues declined slightly by \$0.1 million due to 2.3% fewer passengers.

**REAL ESTATE REVENUES**

***Fiscal Year 2016 Compared to 2015***

The Authority’s commercial real estate line of business earns revenues from ground leases, district service fees and parking on properties owned by the Authority in South Boston, East Boston and Charlestown. Revenues from the Authority’s real estate activities totaled \$24.5 million compared to \$22.1 million in the prior year.

**Real Estate Revenues (in millions)**

	FY 2016	FY 2015
Real Estate	\$ 24.5	\$ 22.1

The increase in revenue was due to a \$1.0 million increase in general rental income due primarily to annual adjustments to ground leases, \$1.0 million of one-time transaction rent from a property re-financing fee and reimbursement fees, and a \$0.4 million increase in parking income due to higher parking volume and market based rate increases.

### ***Fiscal Year 2015 Compared to 2014***

Revenues from the Authority's real estate activities totaled \$22.1 million and reflected a decrease of \$1.9 million versus fiscal year 2014. This was primarily due to a one-time \$2.9 million property re-financing fee earned by the Authority in fiscal year 2014.

## **OPERATING EXPENSES**

The Authority's total operating expenses were \$688.7 million, an increase of \$39.2 million, or 6.0% during fiscal year 2016. The increase was due primarily to a \$20.3 million increase in depreciation and amortization expense, a \$14.9 million increase in pension and other post-employment benefits expense, and a \$5.3 million increase in operations and maintenance expenses which is 1.7% higher than last year.

### **Operating Expenses (in millions)**

	<b>FY 2016</b>	<b>FY 2015</b>	<b>\$ Change</b>	<b>% Change</b>
Aviation Operations and Maintenance	\$ 261.1	\$ 256.5	\$ 4.6	1.8%
Maritime Operations and Maintenance	53.4	54.2	(0.8)	-1.5%
Real Estate Operations and Maintenance	11.9	10.4	1.5	14.4%
General and Administrative	58.2	59.1	(0.9)	-1.5%
Payments in Lieu of Taxes	19.4	19.3	0.1	0.5%
Pension and Other Post-employment Benefits	29.7	14.8	14.9	100.7%
Other	7.6	8.0	(0.4)	-5.0%
Depreciation and Amortization	247.5	227.2	20.3	8.9%
<b>Total Operating Expenses</b>	<b>\$ 688.7</b>	<b>\$ 649.5</b>	<b>\$ 39.2</b>	<b>6.0%</b>

	<b>FY 2015</b>	<b>FY 2014 (restated)</b>	<b>\$ Change</b>	<b>% Change</b>
Aviation Operations and Maintenance	\$ 256.5	\$ 237.2	\$ 19.3	8.1%
Maritime Operations and Maintenance	54.2	50.0	4.2	8.4%
Real Estate Operations and Maintenance	10.4	9.5	0.9	9.5%
General and Administrative	59.1	53.8	5.3	9.9%
Payments in Lieu of Taxes	19.3	18.4	0.9	4.9%
Pension and Other Post-employment Benefits	14.8	16.8	(2.0)	-11.9%
Other	8.0	9.5	(1.5)	-15.8%
Depreciation and Amortization	227.2	217.8	9.4	4.3%
<b>Total Operating Expenses</b>	<b>\$ 649.5</b>	<b>\$ 613.0</b>	<b>\$ 36.5</b>	<b>6.0%</b>

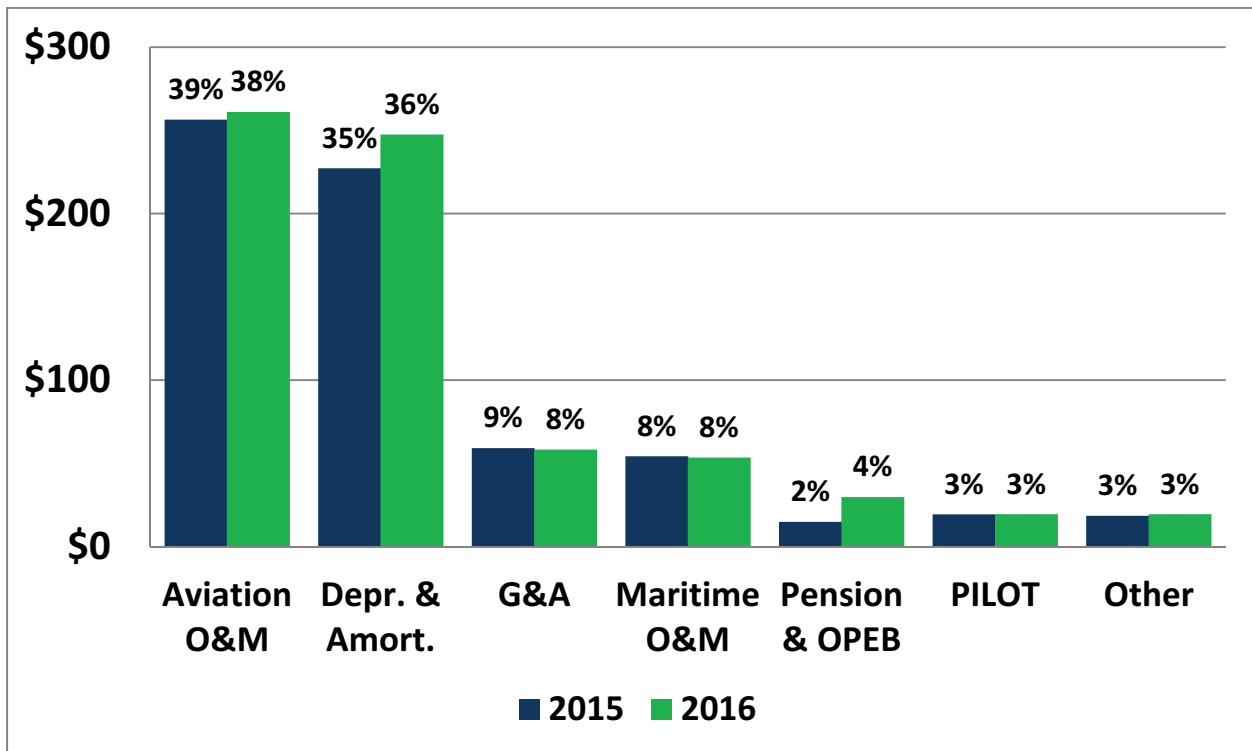
Note: Fiscal 2014 results were restated to conform to GASB No. 68 standards for reporting pension costs.



**Fiscal Year 2015 Compared to Fiscal Year 2014**

The Authority’s total operating expenses were \$649.5 million, an increase of \$36.5 million, or 6.0% compared to fiscal year 2014. In fiscal year 2015, total operating expenses before depreciation and amortization were \$422.4 million, an increase of \$27.2 million, or 6.8%, compared to fiscal year 2014. Depreciation and amortization expenses for fiscal year 2015 were \$227.2 million.

**Operating Expenses (\$ Mils)**  
By Category and % of Total Massport Expenses



**Aviation Operations and Maintenance**

In fiscal year 2016 aviation operations and maintenance expenses were \$261.1 million, an increase of \$4.6 million or 1.8% more than the previous year. The breakdown of aviation operations and maintenance expenses by each of Massport’s aviation facilities is provided below:

## Aviation Operating and Maintenance Expenses (*in millions*)

	FY 2016	FY 2015	FY 2014
Logan	\$ 245.1	\$ 242.6	\$ 225.2
Hanscom	9.3	7.4	7.2
Worcester	6.8	6.5	4.9
Total	\$ 261.1	\$ 256.5	\$ 237.2

### **Logan Airport Operations and Maintenance Expenses – FY 2016**

Operations and maintenance expenses for Logan Airport were \$245.1 million and accounted for approximately 94% of all aviation operations and maintenance expenses and 75% of the Authority's total operations and maintenance expenses. In fiscal year 2016, operations and maintenance expenses for Logan Airport increased by \$2.5 million, or 1.0% over the prior year. The increase included higher payroll and benefits expense of \$3.7 million or 3.5% due to merit increases and collectively bargained wage adjustments along with higher health insurance premiums. Additional environmental remediation costs of \$2.7 million were primarily related to the demolition of the hangar 16 facility. Repairs expense was higher by \$2.0 million for work performed on airfield pavement and other areas of the airport that was in part related to damage done by the severe winter in fiscal year 2015. Growth in passenger volume resulted in a \$1.9 million increase to shuttle bus expense. The airport incurred \$0.5 million of costs to update signage at terminals and on airport roadways as a result of new international airlines serving Logan Airport and the relocation of existing airlines. Collectively, these activities contributed to \$10.8 million in additional expense.

These expense increases were partially offset by \$8.3 million of expense reductions, including \$4.9 million of lower snow-related costs as less staff overtime, materials and supplies, and services were required for snow removal in fiscal year 2016 due to the mild winter. Tenant relocation expenses were lower in fiscal year 2016 by \$2.3 million as there was less activity than in fiscal year 2015, which included costs to relocate Southwest Airlines from Terminal E to Terminal A. Finally, the Authority achieved \$1.1 million in savings related to renting space for parking primarily due to the opening of the Massport parking garage at the Framingham Logan Express site.

### **Logan Airport Operations and Maintenance Expenses – FY 2015**

Operations and maintenance expenses for Logan Airport were \$242.6 million, an increase of \$17.4 million or 7.7% over fiscal year 2014.

- Payroll and benefits expenses increased by \$5.2 million as a result of merit and collectively bargained wage increases and health insurance premiums for the Authority's non-union and union employees.

- Contractual snow removal expenses and additional overtime increased operations and maintenance expenses by \$5.1 million compared to the prior year to respond to the 110 inches of snow.
- A full year of operating the expanded Terminal B, the new Rental Car Center, the new on-airport shuttle bus service, and the Back Bay Logan Express Shuttle Bus added \$4.3 million of expenses in fiscal year 2015.
- The Authority spent \$3.6 million to relocate airlines, including Southwest Airlines which moved from Terminal E to Terminal A, in order to accommodate additional international airlines and passengers in Terminal E.

### **Hanscom Field and Worcester Airport Operations and Maintenance Expenses – FY 2016**

In fiscal year 2016, operations and maintenance expenses for Hanscom Field were \$9.3 million, an increase of \$1.9 million or 25.5% over the prior year. The primary reason for the increase is the hiring of Airport Rescue and Fire Fighting (ARFF) personnel to staff a new fire station facility that added \$1.8 million in new investment to improve safety and emergency response at Hanscom Field.

Operations and maintenance expenses for Worcester Regional Airport increased \$0.3 million or 3.8% to \$6.8 million in fiscal year 2016. The increase reflects additional repairs expense of \$0.3 million primarily for items damaged by the severe winter in fiscal year 2015, additional security costs of \$0.3 million, and an increase in marketing expense of \$0.2 million. These increases were partially offset by \$0.6 million of lower snow-related costs as less overtime, material and supplies and snow removal services were required due to the mild winter.

### **Hanscom Field and Worcester Airport Operations and Maintenance Expenses – FY 2015**

In fiscal year 2015, operations and maintenance expenses for Hanscom Field were \$7.4 million, an increase of \$0.2 million or 2.9% over the prior year. This increase was due to higher professional fees for engineering and environmental consulting services to fulfill the Authority's regulatory reporting requirements.

Operations and maintenance expenses for Worcester Airport increased \$1.7 million or 34% to \$6.5 million in fiscal year 2015. This increase reflects the 67% increase in passengers for a full year of the new JetBlue services and expenses associated with the severe winter storms.

### **Maritime Operations and Maintenance Expenses – FY 2016**

Maritime operations and maintenance expenses were \$53.4 million, \$0.8 million or 1.5% lower than the prior year. The decrease in expenses was due to a \$3.1 million reduction in snow clearing, hauling and snow melting to keep Maritime facilities and public streets operational due

to the mild winter, \$0.4 million of lower utilities expense due primarily to energy costs and a \$0.3 million reduction for environmental consulting services. These decreases were partially offset by \$1.0 million more for port security and state police allocation costs, \$0.9 million higher stevedoring container handling expense due to the 12.0% increase in container volume, an additional \$0.6 million in expenses for repairs and parts for the cranes used at Conley Terminal, and higher payroll and benefits expense of \$0.4 million.

### **Maritime Operations and Maintenance Expenses – FY 2015**

Maritime operations and maintenance expenses were \$54.2 million, \$4.2 million or 8.0% higher than the prior year.

- Significant snow clearing, hauling, and melting services to respond to the 110 inches of snow resulted in additional costs of \$2.3 million to keep Maritime facilities and public streets open.
- The 7.7% increase in container volume at Conley Terminal resulted in higher stevedoring container handling costs of \$1.3 million over prior year.
- Expenses for professional services increased by \$0.6 million to provide electrical safety and preventative maintenance services, structural steel inspections at six steel framed container cranes located at Conley Terminal, and environmental work for the former Coastal Oil property in the Port.

### **Real Estate Operations and Maintenance Expenses – FY 2016**

Real Estate operations and maintenance costs were \$11.9 million, \$1.5 million or 14.4% higher than fiscal year 2015. The increase included \$0.6 million of additional security costs, the majority of which was for resources provided by Massport related to a strike by Verizon employees in Boston. The reimbursement for this expense is included in operating revenue. Professional and consulting fees increased by \$0.5 million due to an increase in development planning and activity in the South Boston Seaport District. Payroll and benefits expense was higher by \$0.3 million.

### **Real Estate Operations and Maintenance Expenses – FY 2015**

Real Estate operations and maintenance costs were \$10.4 million, \$1.0 million or 10% higher than fiscal year 2014.

- Professional and consulting fees increased \$0.4 million in connection with development projects in the South Boston Seaport District.

- Additional public safety patrols in the Seaport District resulted in \$0.3 million higher security costs.
- Snow removal expenses increased by \$0.3 million due to the severe winter.

### **General and Administrative Expenses – FY 2016**

The Authority’s general and administrative costs were \$58.2 million, \$0.9 million or 1.5% lower than fiscal year 2015. The reduction in general and administrative expense consists of a \$1.7 million decrease in Airline Business Incentive Program costs and a \$1.5 million reduction in professional and consulting fees due mainly to disaster resiliency and disaster recovery analysis work performed in fiscal year 2015. These decreases were partially offset by \$1.5 million of additional expenses for Information Technology items including software licenses, equipment maintenance and computer supplies, and a \$0.8 million or 2.1% increase in payroll and benefits expense for administrative employees.

The following table shows the allocation of the Authority’s general and administrative expenses by business line for fiscal years 2016, 2015 and 2014.

### **General and Administrative Expenses (*in millions*)**

	<b>FY 2016</b>	<b>FY 2015</b>	<b>FY 2014</b>
Logan	\$ 42.3	\$ 43.7	\$ 39.0
Hanscom	1.9	1.9	2.4
Worcester	2.0	1.8	1.8
Maritime	8.2	7.1	7.5
Real Estate	3.7	4.6	3.1
<b>Total</b>	<b>\$ 58.2</b>	<b>\$ 59.1</b>	<b>\$ 53.8</b>

### **General and Administrative Expenses – FY 2015**

During fiscal year 2015, the Authority incurred \$59.1 million in general and administrative expenses, an increase of \$5.3 million or 9.8% compared to fiscal year 2014.

- Payroll and benefits costs for administrative employees increased by \$1.6 million.
- An additional \$1.5 million of expense was incurred for the Airline Business Incentive program to attract several new international airlines to serve Logan Airport.
- Destination marketing expense increased by \$1.3 million to support new international services at Logan Airport and JetBlue services at Worcester Airport.

- The Authority contributed \$0.6 million to the Massachusetts League of Community Health Centers and East Boston Neighborhood Health Centers in East Boston and Winthrop to help fund respiratory health programs in the surrounding communities.

### **PILOT, Pension & OPEB and Other Expenses – FY 2016**

In fiscal year 2016, the Authority's PILOT payments to the City of Boston and the Town of Winthrop totaled \$19.4 million and reflect a 0.5%, or \$0.1 million increase over fiscal year 2015. The City of Boston's PILOT payments are contractually linked to the annual rise in the Consumer Price Index (CPI), and also reflect an agreement for mitigation payments to the East Boston Foundation for new facilities being constructed at Logan Airport.

The Authority's expenses for pension and OPEB were \$29.7 million, an increase of \$14.9 million or 100.7% compared to fiscal year 2015. Pension expenses were \$13.4 million higher and OPEB expenses were \$1.4 million higher due to the lowering of the discount rate from 7.50% to 7.25% for both plans and lower stock market returns on plan assets, which increased the Authority's required contributions and expense in fiscal year 2016.

Other operating expenses totaled \$7.6 million and were \$0.4 million lower than the prior year primarily due to fewer workers compensation claims.

The following table shows the allocation of PILOT, pension, OPEB, and other expenses by business line for fiscal years 2016, 2015 and 2014.

### **PILOT, Pension, OPEB, and Other Expenses (*in millions*)**

	<b>FY 2016</b>	<b>FY 2015</b>	<b>FY 2014</b>
Logan	\$ 46.7	\$ 35.3	\$ 37.3
Hanscom	1.1	0.6	0.7
Worcester	0.8	0.5	0.5
Maritime	6.0	4.2	4.9
Real Estate	1.8	1.5	1.3
<b>Total</b>	<b>\$ 56.4</b>	<b>\$ 42.1</b>	<b>\$ 44.7</b>

### **PILOT, Pension & OPEB and Other Expenses – FY 2015**

In fiscal year 2015, the Authority's PILOT payments to the City of Boston and the Town of Winthrop totaled \$19.3 million and reflect a 4.5%, or \$0.8 million increase over fiscal year 2014 PILOT payments. The City of Boston's PILOT payments are contractually linked to the annual rise in the Consumer Price Index (CPI), and also reflect an agreement for mitigation payments to the East Boston Foundation for new facilities being constructed at Logan Airport.

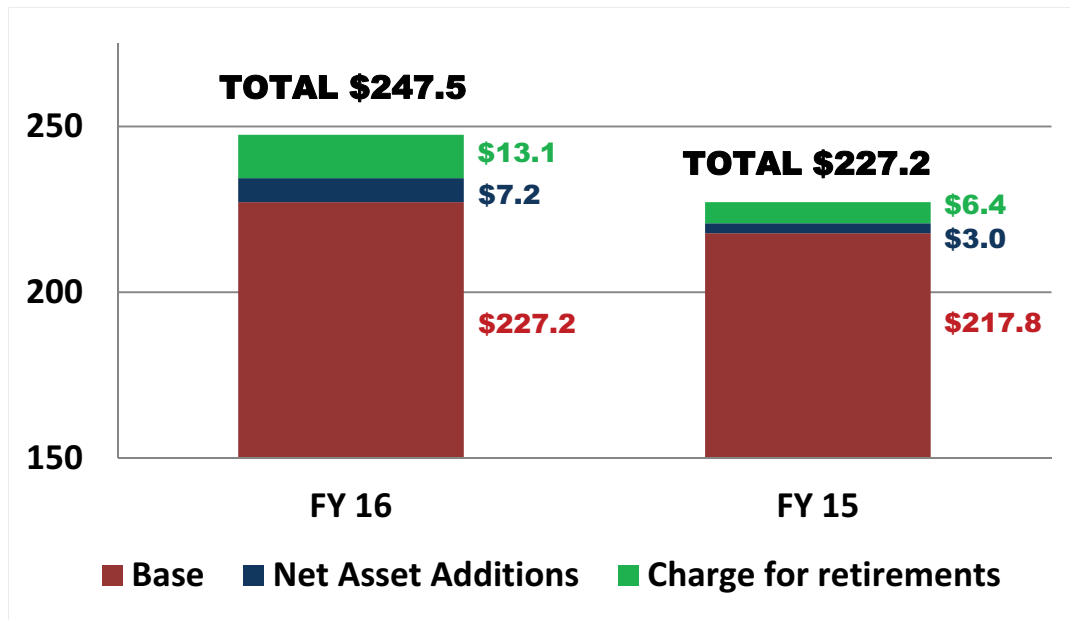
The Authority's expenses for pension and OPEB were \$14.8 million, a reduction of \$2.0 million or 11.9% compared to fiscal year 2014. Pension expenses were \$0.5 million lower and OPEB expenses were \$1.5 million lower because high stock market returns on plan assets exceeded the plan's actuarial benchmarks lowering the Authority's contributions in fiscal year 2015.

Other operating expenses totaled \$8.0 million and were \$1.4 million lower than the prior year due to \$1.0 million of savings on property and casualty insurance premiums and a \$0.4 million recovery in bad debt expense.

### **Depreciation and Amortization Expenses – FY 2016**

The Authority recognized \$247.5 million in depreciation and amortization expenses in fiscal year 2016, an increase of \$20.3 million or 8.9% compared to fiscal year 2015. This increase is the result of \$351.7 million in new assets being placed into service, which added \$25.1 million in new current year depreciation expense. During fiscal year 2016, the Authority completed and placed into service portions of the new Checked Baggage Inspection System (CBIS) at a cost of \$129.9 million. This project will be fully completed and in service in 2017. Other major projects placed into service in fiscal year 2016 include the addition to the Central Parking Garage at Logan Airport at a cost of \$86.6 million; Terminals C to E and Gate 40 connectors at a cost of \$52.9 million; electrical substation replacements at a cost of \$9.4 million; and runway rehabilitation work at a cost of \$6.6 million. The increase to depreciation expense was partially offset by an \$11.5 million decrease associated with \$93.7 million of assets that were fully depreciated in fiscal year 2016. The Authority also recognized a \$13.1 million one-time depreciation charge in fiscal year 2016 related to the retirement of baggage system assets that were replaced as part of the CBIS initiative.

## Depreciation and Amortization Expense (\$ Mils)



### Depreciation and Amortization Expenses – FY 2015

The Authority recognized \$227.2 million in depreciation and amortization expenses in fiscal year 2015, an increase of \$9.4 million or 4.3% compared to fiscal year 2014. This increase was the result of \$225.1 million in new assets being placed into service, which added \$13.2 million in new current year depreciation expense. During fiscal year 2015, the Authority completed and placed into service portions of the new Checked Baggage Inspection System (CBIS) at a cost of \$34.0 million. Other major projects placed into service in fiscal year 2015 included the Quick Turn Around areas and roadways related to the Rental Car Center at a cost of \$31.2 million; the Framingham Logan Express Parking Garage at a cost of \$32.4 million; and the renovation and improvement of Terminals A and B to serve Logan Airport's growing passenger volume at a cost of \$29.9 million. The Authority fully depreciated \$83.9 million in total assets, which reduced depreciation expense by \$10.2 million in fiscal year 2015. The Authority also recognized a \$6.4 million one-time charge to depreciation expense on retired assets taken out of service and not fully depreciated in fiscal year 2015 in connection with the CBIS replacement program.

The Authority recognized a net \$38.5 million in non-operating revenues in fiscal year 2016, an increase of \$0.4 million, or 1.0%, over fiscal year 2015. Non-operating revenues in fiscal year 2015 were \$38.1 million, an increase of \$2.6 million or 7.3% over the \$35.5 million recognized in fiscal year 2014.



## NON-OPERATING REVENUES (EXPENSES) AND CAPITAL CONTRIBUTIONS

The Authority recognized a net \$38.5 million in non-operating revenues in fiscal year 2016, an increase of \$0.4 million, or 1.0%, over fiscal year 2015. Non-operating revenues in fiscal year 2015 were \$38.1 million, an increase of \$2.6 million or 7.3% over the \$35.5 million recognized in fiscal year 2014.

### Non-operating Revenues and Expenses and Capital Contributions (*in millions*)

	FY 2016	FY 2015	\$ Change	% Change
Passenger facility charges	\$ 70.7	\$ 65.8	\$ 4.9	7.4%
Customer facility charges	32.3	30.8	1.5	4.9%
Investment income	9.5	7.4	2.1	28.4%
Other income (expense), net	1.5	9.8	(8.3)	-84.7%
Terminal A debt service contributions	(11.9)	(10.9)	(1.0)	9.2%
Interest expense	(63.6)	(64.8)	1.2	-1.9%
<b>Total Non-operating Revenues (Expenses)</b>	<b>\$ 38.5</b>	<b>\$ 38.1</b>	<b>\$ 0.4</b>	<b>1.0%</b>
<b>Capital Contributions</b>	<b>\$ 56.0</b>	<b>\$ 56.0</b>	<b>0.0</b>	<b>0.0%</b>

	FY 2015	FY 2014	\$ Change	% Change
Passenger facility charges	\$ 65.8	\$ 62.7	\$ 3.1	4.9%
Customer facility charges	30.8	30.0	0.8	2.7%
Investment income	7.4	6.6	0.8	12.1%
Other income (expense), net	9.8	13.0	(3.2)	-24.6%
Terminal A debt service contributions	(10.9)	(11.8)	0.9	-7.6%
Interest expense	(64.8)	(65.0)	0.2	-0.3%
<b>Total Non-operating Revenues (Expenses)</b>	<b>\$ 38.1</b>	<b>\$ 35.5</b>	<b>\$ 2.6</b>	<b>7.3%</b>
<b>Capital Contributions</b>	<b>\$ 56.0</b>	<b>\$ 56.1</b>	<b>(0.1)</b>	<b>-0.2%</b>

For fiscal year 2016, Passenger Facility Charges were \$70.7 million, a \$4.9 million or 7.4% increase over last year due to increased passenger activity at Logan Airport. Revenues from Customer Facility Charges totaled \$32.3 million, \$1.5 million higher than the prior year due to a 5.1% increase in rental car transaction days at Logan Airport's Rental Car Center. The Authority also generated \$9.5 million of investment income, an increase of \$2.1 million from higher interest rates on fixed income investments and an increase in the Authority's cash balance available for investment. Other income (expense), which is comprised of settlement claims, gains or losses on short term investments, gains or losses on the sale of equipment, and any other Authority income, was \$1.5 million, a decrease of \$8.3 million. Included in the prior year was a \$10.0 million capital contribution from the Terminal A Maintenance Reserve Fund to cover the costs associated with Terminal A improvements. These funds were part of the lease

agreement with the tenant to cover such costs. Additionally, the Authority recorded a holding gain of \$2.0 million at June 30, 2016 related to the fair value of its investments compared to a \$0.5 million holding gain at June 30, 2015. Also, during fiscal year 2016, the Authority made a voluntary contribution of \$11.9 million in PFCs to the Terminal A debt service fund to help reduce terminal rental rates, which was \$1.0 million higher than the prior year. Interest expense on long term debt was \$63.6 million, a decrease of \$1.2 million or 1.9% from fiscal year 2015.

For fiscal year 2015, PFCs were \$65.8 million, a \$3.1 million or 4.9% increase over the prior year due to increased passenger activity at Logan Airport. Revenues from CFCs totaled \$30.8 million, \$0.8 million higher than the prior year due to a 2.5% increase in rental car transaction days at Logan Airport's Rental Car Center. The Authority also generated \$7.4 million of investment income, an increase of \$0.8 million from higher interest rates on fixed income investments and an increase in the Authority's cash balance available for investment. Other income (expense) was \$9.8 million, a decrease of \$3.2 million. Fiscal years 2015 and 2014 include a \$10.0 million capital contribution from the Terminal A Maintenance Reserve Fund to cover the costs associated with Terminal A improvements. Additionally, the Authority recorded a holding gain of \$0.5 million at June 30, 2015 related to the fair value of its investments compared to a \$1.5 million holding gain at June 30, 2014. Also, during fiscal year 2015, the Authority made a voluntary contribution of \$10.9 million in PFCs to the Terminal A debt service fund to help reduce terminal rental rates. Interest expense on long term debt was \$64.8 million, a decrease of \$0.2 million or 0.3% from fiscal year 2014.

### ***Capital Contributions***

The majority of the Authority's capital contributions are grants awarded by the Federal Aviation Administration (FAA) for the Airport Improvement Program (AIP) to construct runways, taxiways, apron lighting, residential sound proofing projects, and other capital related projects, primarily at Logan Airport. The Authority also receives capital contributions from the Department of Homeland Security, as well as grants from the Federal Emergency Management Administration, the U.S. Department of Transportation, the Environmental Protection Agency and the Massachusetts Executive Office of Public Safety and Security related to the Port Security Grant Program which safeguards the Port of Boston.

Capital contributions recognized in fiscal year 2016 were \$56.0 million, comparable to the prior year. These revenues were primarily generated from Transportation Security Administration (TSA) reimbursements for the ongoing construction of the new Checked Baggage Inspection System (CBIS) at Logan Airport and the FAA AIP grant program. The remaining projects eligible to be reimbursed by capital grants or contributions are ongoing and are expected to be reimbursed in future years.

In fiscal year 2015, the Authority recognized capital contributions of \$56.0 million, a decrease of \$0.1 million from the amount received in fiscal year 2014. These revenues were primarily

generated from Transportation Security Administration (TSA) reimbursements for the ongoing construction of the new Checked Baggage Inspection System (CBIS) at Logan Airport and the FAA AIP grant program.

## THE AUTHORITY'S STATEMENTS OF NET POSITION

The Statements of Net Position present the financial position of the Authority at the end of each fiscal year. The Statements include all assets, deferred outflows, liabilities and deferred inflows of the Authority. Net Position is the difference between total assets plus deferred outflows less total liabilities and deferred inflows and is an indicator of the current fiscal health of the Authority. A summarized comparison of the Authority's assets, deferred outflows, liabilities, deferred inflows and net position at June 30, 2016, 2015 and 2014 is as follows:

### Condensed Statements of Net Position for FY 2016 and FY 2015 *(in millions)*

	FY 2016	FY 2015	\$ Change	% Change
<b>Assets</b>				
Current assets	\$ 632.3	\$ 794.2	(\$ 161.9)	-20.4%
Capital assets, net	3,086.9	2,960.3	126.6	4.3%
Other non-current assets	496.7	394.9	101.8	25.8%
<b>Total Assets</b>	<b>4,215.9</b>	<b>4,149.4</b>	<b>66.5</b>	<b>1.6%</b>
<b>Deferred Outflows of Resources</b>				
Deferred loss on refunding of bonds	17.9	17.8	0.1	0.6%
Deferred loss on expected vs actual Pension Plan experience	0.3	1.8	(1.5)	-83.3%
Deferred loss on Pension Plan Change of Assumptions	20.8	0.0	20.8	100.0%
Deferred loss on Pension Plan investments	25.9	0.0	25.9	100.0%
<b>Total Deferred Outflows of Resources</b>	<b>64.9</b>	<b>19.6</b>	<b>45.3</b>	<b>231.1%</b>
<b>Liabilities</b>				
Current liabilities	\$ 331.9	\$ 325.0	\$ 6.9	2.1%
Bonds payable, including current portion	1,724.5	1,785.2	(60.7)	-3.4%
Other non-current liabilities	132.4	66.5	65.9	99.1%
<b>Total Liabilities</b>	<b>2,188.8</b>	<b>2,176.7</b>	<b>12.1</b>	<b>0.6%</b>
<b>Deferred Inflows of Resources</b>				
Deferred gain on refunding of bonds	8.1	0.0	8.1	100.0%
Deferred gain on Pension Plan investments	0.0	13.7	(13.7)	-100.0%
<b>Total Deferred Inflows of Resources</b>	<b>8.1</b>	<b>13.7</b>	<b>(5.6)</b>	<b>-40.9%</b>
<b>Total Net Position</b>	<b>\$ 2,083.9</b>	<b>\$ 1,978.6</b>	<b>\$ 105.3</b>	<b>5.3%</b>

The Authority ended fiscal year 2016 with total assets of \$4,215.9 million, an increase of \$66.5 million or 1.6%. This increase is primarily due to the growth in investment in capital assets. Deferred outflows of resources for fiscal year 2016 were \$64.9 million, a \$45.3 million increase from the previous year due to the change in the assumptions related to the discount rate on pension plan assets and investment gains on pension plan assets that did not achieve

their actuarial benchmark. These deferred amounts will be amortized over a five to seven year period. The Authority's total assets consist primarily of capital assets, which represent approximately \$3,086.9 million or 72.1% of the Authority's total assets and deferred outflows of resources as of June 30, 2016.

The Authority's total liabilities as of June 30, 2016 were \$2,188.8 million, an increase of \$12.1 million or 0.6% due to the increase in the pension liability of \$63.7 million and an increase in accrued liabilities of \$34.1 million, partially offset by the \$85.8 million reduction in debt service and note payments made during the year. The Authority's deferred inflows of resources at June 30, 2016 was the result of a deferred gain on the issuance of the 2015 C refunding bonds to defease the 2005 C bonds. The prior year amount of \$13.7 million was related to defer gains on pension investments and this amount was reclassified to the deferred outflow of resources at June 30, 2016. The Authority's liabilities consist primarily of bonds payable (including current portion), which accounted for 78.5% of the Authority's total liabilities and deferred inflows at June 30, 2016.

The Authority's total net position for fiscal year 2016 was \$2,083.9 million, a \$105.3 million or 5.3% increase over the prior year. This increase reflects the Authority's net operating income of \$10.8 million, net non-operating income of \$38.5 million and capital contributions of \$56.0 million.

### Condensed Statements of Net Position for FY 2015 and FY 2014 *(in millions)*

	FY 2015	FY 2014 (restated)	\$ Change	% Change
<b>Assets</b>				
Current assets	\$ 794.2	\$ 522.9	\$ 271.3	51.9%
Capital assets, net	2,960.3	2,900.6	59.7	2.1%
Other non-current assets	394.9	418.1	(23.2)	-5.5%
<b>Total Assets</b>	<b>4,149.4</b>	<b>3,841.6</b>	<b>307.8</b>	<b>8.0%</b>
<b>Deferred Outflows of Resources</b>				
Deferred loss on refunding of bonds	17.8	20.0	(2.2)	-11.0%
Deferred loss on expected vs actual Pension Plan experience	1.8	0.0	1.8	100.0%
<b>Total Deferred Outflows of Resources</b>	<b>19.6</b>	<b>20.0</b>	<b>(0.4)</b>	<b>-2.0%</b>
<b>Liabilities</b>				
Current liabilities	\$ 325.0	\$ 307.3	\$ 17.7	5.8%
Bonds payable, including current portion	1,785.2	1,586.5	198.7	12.5%
Other non-current liabilities	66.5	71.2	(4.7)	-6.6%
<b>Total Liabilities</b>	<b>2,176.7</b>	<b>1,965.0</b>	<b>211.7</b>	<b>10.8%</b>
<b>Deferred Inflows of Resources</b>				
Deferred gain on Pension Plan investments	13.7	25.4	(11.7)	-46.1%
<b>Total Deferred Inflows of Resources</b>	<b>13.7</b>	<b>25.4</b>	<b>(11.7)</b>	<b>-46.1%</b>
<b>Total Net Position</b>	<b>\$ 1,978.6</b>	<b>\$ 1,871.2</b>	<b>\$ 107.4</b>	<b>5.7%</b>

The Authority ended fiscal year 2015 with total assets of \$4,149.4 million an increase of \$307.8 million or 8.0%. This increase reflects investments in restricted assets from the Authority's bond sale. Deferred outflows of resources for fiscal year 2015 were \$19.6 million, a \$0.4 million decline from the previous year due to the amortization of deferred loss on the refunding of bonds. The Authority's total assets consist primarily of capital assets, which represent approximately \$2,960.3 million or 71.0% of the Authority's total assets and deferred outflows of resources as of June 30, 2015.

The Authority's total liabilities as of June 30, 2015 were \$2,176.7 million, an increase of \$211.7 million or 10.8% due to the \$249.8 million bond sale the Authority executed in July 2014. The Authority's \$13.7 million deferred inflows of resources were lower by \$11.7 million reflecting the reduction in the difference between market value and actuarial value of pension plan assets. The Authority's liabilities consist primarily of bonds payable (including current portion), which accounted for 81.5% of the Authority's total liabilities and deferred inflows at June 30, 2015.

The Authority's total net position for fiscal year 2015 was \$1,978.6 million, a \$107.4 million or 5.7% increase over the prior year. This increase reflects the Authority's net operating income of \$13.4 million, net non-operating income of \$38.1 million and capital contributions of \$56.0 million.

### ***Net Position***

The Authority's total net position, which represents the residual interest in the Authority's assets and deferred outflows less the Authority's liabilities and deferred inflows, was \$2,083.9 million as of June 30, 2016, an increase of \$105.3 million, or 5.3% from fiscal year 2015. Of this amount, \$1,310.9 million is the net investment in capital assets, an increase of \$38.6 million compared to fiscal year 2015. The Authority's restricted net position of \$529.6 million as of June 30, 2016 is subject to the pledge of the 1978 Trust Agreement, the PFC Trust Agreement, the CFC Trust Agreement or custodial agreements in the Authority's name. The Authority's restricted net position increased by \$12.7 million as of June 30, 2016. This increase is primarily attributable to higher PFC and CFC collections partially offset by the timing of bond and project funds payments. The Authority's unrestricted net position for fiscal year ending June 30, 2016 was \$243.4 million, an increase of \$53.9 million versus the \$189.5 million of unrestricted net position reported in fiscal year 2015 due to additional cash generated from operations in fiscal year 2016.

The Authority's total net position at June 30, 2015 was \$1,978.6 million, an increase of \$107.4 million as compared to the \$1,871.2 million reported in fiscal year 2014. The net investment in capital assets was \$1,272.3 million for fiscal year 2015, an increase of \$44.9 million compared to fiscal year 2014. The Authority's restricted net position totaled \$516.9 million as of June 30, 2015 and was subject to the pledge of the 1978 Trust Agreement, the PFC Trust Agreement, the CFC Trust Agreement or custodial agreements in the Authority's

name. The Authority's restricted net position as of June 30, 2015 increased by \$7.4 million compared to the \$509.5 million reported in fiscal year 2014, primarily due to the CFC Trust Agreement as the liabilities related to the construction of the Rental Car Center had been paid. The Authority's unrestricted net position for fiscal year ending June 30, 2015 was \$189.5 million, an increase of \$55.1 million. This increase was due to the change in method of accounting for pension contributions and additional cash generated from operations in fiscal year 2015.

## CAPITAL ASSETS AND DEBT ADMINISTRATION

### *Capital Assets*

As of June 30, 2016 and 2015, the Authority had \$3,086.9 million and \$2,960.3 million of capital assets (net of depreciation), respectively. These include land, construction in process, buildings, runways, roadways, machinery and equipment, air rights and parking rights. The Authority's net capital assets increased approximately \$126.6 million, or 4.3% in fiscal year 2016 primarily as the result of \$375.9 million in capital expenditures partially offset by \$247.5 million of depreciation expense.

The Authority placed \$351.7 million of assets into service for completed capital projects during fiscal year 2016. This included portions of the new Checked Baggage Inspection System (CBIS) at a cost of \$129.8 million. This project will be fully completed and in service in 2017. Other major projects placed into service in fiscal year 2016 include the Central Parking Garage additional at Logan Airport at a cost of \$86.6 million; Terminals C to E and Gate 40 connectors at a cost of \$52.9 million; electrical substation replacements at a cost of \$9.4 million; and runway rehabilitation work at a cost of \$6.6 million.

Capital assets, net comprised approximately 72.1%, 71.0% and 75.1% of the Authority's total assets and deferred outflows of resources at June 30, 2016, 2015 and 2014, respectively. During fiscal years 2016, 2015 and, 2014, the Authority spent approximately \$351.0 million, \$294.2 million, and \$329.3 million, respectively, constructing new assets and improving existing assets already in service, inclusive of construction in process.

During fiscal year 2015, the Authority placed into service \$225.1 million of completed capital projects, which included a portion of the new Checked Baggage Inspection System (CBIS) at a cost of \$34.0 million. Other major projects placed into service in fiscal year 2015 included the completion of the Quick Turn Around areas and roadways related to the Rental Car Center at a cost of \$31.2 million, the building of the Framingham Logan Express Parking Garage at a cost of \$32.4 million, and the renovation and improvement of Terminal A and B to serve the increase in passenger volumes at a cost of \$29.9 million.

During fiscal year 2014, the Authority placed into service \$536.1 million of completed capital projects, including the Logan Airport Rental Car Center which opened in September 2013, the renovation and improvement of Terminal B to serve United Airlines, the acquisition of the Braintree Logan Express facility, the rehabilitation of the Taxiway North Alpha and Bravo, and curb enhancement upgrades to better serve High Occupancy Vehicles and the Silver Line.

The Authority's capital assets are principally funded by the proceeds of revenue bonds; Authority generated revenues; PFCs; CFCs; and federal and state grants.

The Authority's aviation facilities account for approximately 91% of all capital assets. The following chart provides a breakdown of total capital assets at June 30 2016, 2015 and 2014.

### Capital Assets by Type (in thousands)

	FY 2016	FY 2015	FY 2014	% Change 2016-2015	% Change 2015-2014
Land	\$ 226,497	\$ 211,444	\$ 202,699	7.1%	4.3%
Construction in progress	225,930	217,689	155,071	3.8%	40.4%
Buildings	1,594,212	1,533,131	1,517,800	4.0%	1.0%
Runways and other pavings	356,538	372,970	393,339	-4.4%	-5.2%
Roadways	351,920	375,002	386,666	-6.2%	-3.0%
Machinery and equipment	243,958	154,183	143,249	58.2%	7.6%
Air rights	64,711	71,265	75,605	-9.2%	-5.7%
Parking rights	23,131	24,673	26,215	-6.2%	-5.9%
<b>Capital assets, net</b>	<b>\$ 3,086,897</b>	<b>\$ 2,960,357</b>	<b>\$ 2,900,644</b>	<b>4.3%</b>	<b>2.1%</b>

### Debt Administration

The Authority's bond sales must be approved by its Board Members and must comply with the rules and regulations of the United States Treasury Department. The Authority, through its 1978 Trust Agreement, has a covenant to maintain a debt service coverage ratio of not less than 1.25. Debt service coverage is calculated based on a formula set forth in the 1978 Trust Agreement. Historically, the Authority has maintained a debt service coverage ratio higher than its 1978 Trust Agreement requirement to maintain its high investment grade bond ratings. As of June 30, 2016, 2015, and 2014, the Authority's debt service coverage under the 1978 Trust Agreement was 2.96, 2.49, and 2.65, respectively.

The 1999 PFC Trust Agreement requires a First Lien Sufficiency covenant ratio in excess of 1.05. As of June 30, 2016, 2015, and 2014, the Authority's PFC First Lien Sufficiency covenant under the PFC Trust Agreement was 11.03, 5.64, and 4.75, respectively.

The CFC Trust Agreement requires that the Authority maintain a debt service coverage ratio of at least 1.3. As of June 30, 2016, 2015, and 2014, the CFC debt service coverage ratio was 2.50, 2.42, and 2.69, respectively.

The Authority had net bonds payable outstanding as of June 30, 2016 in the amount of approximately \$1,625.5 million, a net decrease of approximately \$70.3 million compared to fiscal year 2015. During fiscal year 2016, the Authority issued \$171.5 million of Massachusetts Port Authority Revenue Bonds in two series. The Series 2015 A Revenue Bonds, in the principal amount of \$104.5 million, were issued to finance capital improvements which included the completion of the parking garage at the Framingham Logan Express site, property acquisition and parking improvements at the Braintree Logan Express and construction of 2,050 additional parking spaces at Logan Airport. The Series 2015 B Revenue Bonds were issued in the amount of \$67.0 million and were used to finance capital improvements which included construction of a post security corridor between Terminal C and Terminal E, HVAC equipment replacement, HVAC equipment distribution, roof replacements, the creation of new remain overnight parking spaces and Terminal A airline relocation. Due to the “private activity” nature of the construction projects, they were sold as AMT bonds.

The Authority had net bonds payable outstanding as of June 30, 2015 in the amount of approximately \$1,695.8 million, a net increase of approximately \$182.5 million compared to fiscal year 2014. The increase was the result of new and refunding bonds issued during fiscal year 2015 reduced by principal payments. On July 17, 2014, the Authority issued \$249.8 million of Massachusetts Port Authority Revenue Bonds in three series. The Series 2014 A Revenue Bonds were issued in the principal amount of \$45.5 million with an original issue premium of approximately \$5.6 million and coupon rates ranging from 2.0% to 5.0%. The Series 2014 B Revenue Bonds were issued in the principal amount of \$48.2 million with an original issue premium of approximately \$4.8 million and coupon rates ranging from 4.0% to 5.0%. Series 2014 C Revenue Refunding Bonds were issued in the principal amount of \$156.1 million with an original issue premium of approximately \$21.7 million and coupons ranging from 2.0% to 5.0%. The aggregate difference in debt services between the refunded Series 2003 A, 2003 C and the 2005 A bonds and the Series 2014 C refunding bonds was \$23.6 million. This refunding had an economic gain and achieved a net present value savings of \$17.1 million or 10.0%. The average annual savings for fiscal year 2015 through fiscal year 2035 was approximately \$1.126 million.

On June 30, 2015, the Authority issued \$170.7 million of Massachusetts Port Authority Revenue Refunding Bonds Series 2015 C. The Series 2015 C Revenue Refunding Bonds were issued as two fixed rate direct placement bonds due to mature in 2025 and 2029, respectively. This competitive bank bid process resulted in a net present value savings of nearly \$27.5 million and the proceeds were used to refund the entire outstanding balance of the Authority’s 2005 Series C Revenue Bonds on July 1, 2015.

The Authority had net bonds payable outstanding as of June 30, 2014 in the amount of approximately \$1,510 million, a net decrease of approximately \$64.4 million compared to fiscal year 2013. The decrease was the result of principal paid during fiscal year 2014.



The Official Statements relating to the Authority's Bond issuances are available from the Authority or by accessing the Authority's website.

## THE AUTHORITY'S CONDENSED CASH FLOWS

The following summary shows the major sources and uses of cash during the following fiscal years:

### Statements of Cash Flows (in millions)

	FY 2016	FY 2015	\$ Change	% Change
Net cash provided by operating activities	\$ 280.7	\$ 255.7	\$ 25.0	9.8%
Net cash (used in) capital and related financing activities	(318.3)	(42.8)	(275.5)	643.7%
Net cash (used in) investing activities	(125.1)	(21.4)	(103.7)	484.6%
Net (decrease)/increase in cash and cash equivalents	(162.7)	191.4	(354.2)	-185.0%
Cash and cash equivalents, beginning of year	413.2	221.7	191.5	86.4%
<b>Cash and cash equivalents, end of year</b>	<b>\$ 250.5</b>	<b>\$ 413.2</b>	<b>(\$ 162.7)</b>	<b>-39.4%</b>

	FY 2015	FY 2014 (restated)	\$ Change	% Change
Net cash provided by operating activities	\$ 255.7	\$ 205.1	\$ 50.6	24.7%
Net cash (used in) capital and related financing activities	(42.8)	(301.0)	258.2	-85.8%
Net cash (used in) provided by investing activities	(21.4)	74.4	(95.8)	-128.8%
Net (decrease)/increase in cash and cash equivalents	191.4	(21.6)	213.0	-986.1%
Cash and cash equivalents, beginning of year	221.7	243.3	(21.6)	-8.9%
<b>Cash and cash equivalents, end of year</b>	<b>\$ 413.2</b>	<b>\$ 221.7</b>	<b>\$ 191.5</b>	<b>86.4%</b>

The Authority's cash and cash equivalents at June 30, 2016 was \$250.5 million, a decrease of \$162.7 million, or 39.4% from the \$413.2 million in cash and cash equivalents reported in fiscal year 2015. The Authority generated \$280.7 million in cash from operations during fiscal year 2016 compared to \$255.7 million in the prior year, an increase of \$25.0 million, or 9.8%, primarily from increased business activity at Logan Airport and its other facilities. The Authority used \$318.3 million in cash for capital and related financing activities to finance the Authority's capital program and to pay debt service expenses during the year. This was a \$275.5 million increase in the use of cash from the \$42.8 million in cash used for capital and related financing activities in fiscal year 2015. The Authority used \$125.1 million in cash from investments

towards its capital and operating needs, an increase of \$103.7 million from the amount of cash used for investing activities in fiscal year 2015.

The Authority's cash and cash equivalents at June 30, 2015 was \$413.2 million, an increase of \$191.5 million, or 86.4% from the \$221.7 million in fiscal year 2014. The Authority generated \$255.7 million in cash from operations during fiscal year 2015 compared to \$205.1 million in the prior year, an increase of \$50.6 million, or 24.7%, primarily from increased business activity at Logan Airport and the Port. The Authority used \$42.8 million in cash for capital and related financing activities to finance the Authority's capital program and to pay debt service expenses during the year. This is a \$258.2 million decrease in the use of cash from the \$301.0 million in cash used for capital and related financing activities in fiscal year 2014. The Authority used \$21.4 million in cash from investments towards its capital and operating needs, a decrease of \$95.7 million from the amount of cash used for investing activities in fiscal year 2014.

## **Contacting the Authority's Financial Management**

For additional information concerning the Authority and the Retirement System, please see the Authority's website, [www.massport.com](http://www.massport.com). Financial information can be found by clicking on "About Massport", and then clicking on "Investor Relations" and "Comprehensive Annual Financial Report (CAFR)". The Authority's executive offices are located at One Harborside Drive, Suite 200S, East Boston, Massachusetts 02128, and the main telephone number is (617) 568-5000. Questions may be directed to John P. Prankevicius, CPA, Director of Administration and Finance, and Secretary-Treasurer for the Massachusetts Port Authority.

**MASSACHUSETTS PORT AUTHORITY**

Statements of Net Position

June 30, 2016 and 2015

(In thousands)

	<u>2016</u>	<u>2015</u>
Current assets:		
Cash and cash equivalents	\$ 63,497	\$ 54,568
Investments	82,062	80,224
Restricted cash and cash equivalents	186,966	358,614
Restricted investments	210,006	177,357
Accounts receivable		
Trade, net	60,289	57,921
Grants receivable	21,874	55,807
Total receivables (net)	82,163	113,728
Prepaid expenses and other assets	7,624	9,761
Total current assets	<u>632,318</u>	<u>794,252</u>
Noncurrent assets:		
Investments	138,482	73,475
Restricted investments	293,320	256,025
Prepaid expenses and other assets	6,357	6,320
Investment in joint venture	2,595	2,395
Net OPEB asset	55,914	56,669
Capital assets-not being depreciated	452,427	429,133
Capital assets-being depreciated-net	2,634,470	2,531,224
Total noncurrent assets	<u>3,583,565</u>	<u>3,355,241</u>
Total assets	<u>4,215,883</u>	<u>4,149,493</u>
Deferred outflows of resources		
Deferred loss on refunding of bonds	17,868	17,821
Deferred loss on expected vs actual Plan experience	290	1,771
Deferred loss on Pension Plan Change of Assumptions	20,797	—
Deferred loss on Pension Plan Investments	25,945	—
Total deferred outflows of resources	<u>64,900</u>	<u>19,592</u>
Current liabilities:		
Accounts payable and accrued expenses	149,089	117,806
Compensated absences	1,416	1,415
Contract retainage	10,843	10,165
Current portion of long term debt	90,402	257,621
Commercial notes payable	125,000	150,000
Accrued interest on bonds payable	36,093	35,555
Unearned revenues	9,423	10,017
Total current liabilities	<u>422,266</u>	<u>582,579</u>
Noncurrent liabilities:		
Accrued expenses	9,756	10,242
Compensated absences	18,119	18,105
Net pension liability	91,915	28,209
Contract retainage	3,483	—
Long-term debt, net	1,634,073	1,527,614
Unearned revenues	9,141	9,965
Total noncurrent liabilities	<u>1,766,487</u>	<u>1,594,135</u>
Total liabilities	<u>2,188,753</u>	<u>2,176,714</u>
Deferred inflows of resources		
Deferred gain on refunding of bonds	8,088	—
Deferred gain on Pension Plan investments	—	13,735
Total deferred inflows of resources	<u>8,088</u>	<u>13,735</u>
Net position		
Net investment in capital assets	1,310,922	1,272,271
Restricted		
Bond funds	202,619	193,825
Project funds	186,303	219,221
Passenger facility charges	83,252	68,016
Customer facility charges	30,051	12,009
Other purposes	27,391	23,835
Total restricted	<u>529,616</u>	<u>516,906</u>
Unrestricted	243,404	189,459
Total net position	<u>\$ 2,083,942</u>	<u>\$ 1,978,636</u>

The accompanying notes are an integral part of these financial statements.

**MASSACHUSETTS PORT AUTHORITY**

Statements of Revenues, Expenses, and Changes in Net Position

Years ended June 30, 2016 and 2015

(In thousands)

	<u>2016</u>	<u>2015</u>
Operating revenues:		
Aviation rentals	\$ 198,103	\$ 185,953
Aviation parking	154,568	149,155
Aviation shuttle bus	18,009	15,717
Aviation fees	139,425	135,044
Aviation concessions	87,401	82,662
Aviation operating grants and other	2,781	3,894
Maritime fees, rentals and other	74,654	68,435
Real estate fees, rents and other	<u>24,537</u>	<u>22,069</u>
Total operating revenues	<u>699,478</u>	<u>662,929</u>
Operating expenses:		
Aviation operations and maintenance	261,115	256,519
Maritime operations and maintenance	53,359	54,231
Real estate operations and maintenance	11,887	10,428
General and administrative	58,232	59,064
Payments in lieu of taxes	19,375	19,282
Pension and other post-employment benefits	29,654	14,844
Other	<u>7,595</u>	<u>8,005</u>
Total operating expenses before depreciation and amortization	441,217	422,373
Depreciation and amortization	<u>247,502</u>	<u>227,158</u>
Total operating expenses	<u>688,719</u>	<u>649,531</u>
Operating income	<u>10,759</u>	<u>13,398</u>
Nonoperating revenues and (expenses):		
Passenger facility charges	70,718	65,807
Customer facility charges	32,335	30,768
Investment income	9,453	7,405
Net increase in the fair value of investments	2,116	527
Other revenues	49	10,091
Settlement of claims	70	—
Terminal A debt service contribution	(11,903)	(10,918)
Other expenses	(116)	(956)
(Loss) gain on sale of equipment / property	(595)	180
Interest expense	<u>(63,613)</u>	<u>(64,829)</u>
Total nonoperating revenues (expenses), net	<u>38,514</u>	<u>38,075</u>
Increase in net position before capital contributions	49,273	51,473
Capital contributions	<u>56,033</u>	<u>55,953</u>
Increase in net position	105,306	107,426
Net position, beginning of year	<u>1,978,636</u>	<u>1,871,210</u>
Net position, end of year	<u>\$ 2,083,942</u>	<u>\$ 1,978,636</u>

The accompanying notes are an integral part of these financial statements.

**MASSACHUSETTS PORT AUTHORITY**

Statements of Cash Flows  
Years ended June 30, 2016 and 2015  
(In thousands)

	<u>2016</u>	<u>2015</u>
Cash flows from operating activities:		
Cash received from customers and operating grants	\$ 712,999	\$ 677,130
Payments to vendors	(252,764)	(248,442)
Payments to employees	(147,651)	(142,248)
Payments in lieu of taxes	(19,875)	(18,782)
Other post-employment benefits	(12,000)	(12,000)
Net cash provided by operating activities	<u>280,709</u>	<u>255,658</u>
Cash flows from capital and related financing activities:		
Acquisition and construction of capital assets	(350,960)	(294,166)
Proceeds from the issuance of bonds, net	194,270	451,842
Principal payments on refunded debt	(170,485)	(170,210)
Interest paid on bonds and notes	(73,726)	(80,831)
Principal payments on long-term debt	(71,315)	(67,790)
Proceeds from commercial paper financing	44,000	33,000
Principal payments on commercial paper	(69,000)	(33,000)
Terminal A debt service contribution	(11,903)	(10,918)
Proceeds from passenger facility charges	70,204	67,507
Proceeds from customer facility charges	31,955	29,826
Proceeds from capital contributions	87,657	31,733
Settlement of claims	70	—
Proceeds from sale of equipment	887	181
Net cash used in capital and related financing activities	<u>(318,346)</u>	<u>(42,826)</u>
Cash flows from investing activities:		
Purchases of investments, net	(679,365)	(474,551)
Sales of investments, net	545,641	445,716
Realized gain on sale of investments	88	123
Interest received on investments	8,554	7,322
Net cash used in investing activities	<u>(125,082)</u>	<u>(21,390)</u>
Net (decrease) increase in cash and cash equivalents	<u>(162,719)</u>	<u>191,442</u>
Cash and cash equivalents, beginning of year	413,182	221,740
Cash and cash equivalents, end of year	\$ <u>250,463</u>	\$ <u>413,182</u>
Reconciliation of operating income to net cash provided by operating activities:		
Cash flows from operating activities:		
Operating income	\$ 10,759	\$ 13,398
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation and amortization	247,502	227,158
Provision for uncollectible accounts	186	31
Changes in operating assets and liabilities:		
Trade receivables	(2,025)	355
Prepaid expenses and other assets	3,149	4,607
Prepaid expenses and other assets – long-term	755	(1,251)
Accounts payable and accrued expenses	14,897	17,650
Net pension liability and deferred inflows/outflows	4,711	(8,956)
Compensated absences	15	(937)
Unearned revenue	760	3,603
Net cash provided by operating activities	\$ <u>280,709</u>	\$ <u>255,658</u>
Noncash investing activities:		
Net increase in the fair value of investments	\$ <u>3,154</u>	\$ <u>1,125</u>

The accompanying notes are an integral part of these financial statements.

# MASSACHUSETTS PORT AUTHORITY

## Notes to Financial Statements

June 30, 2016 and 2015

### 1. Summary of Significant Accounting Policies and Practices

#### Reporting Entity

The Massachusetts Port Authority (the "Authority") is a body politic and corporate and a public instrumentality of The Commonwealth of Massachusetts (the "Commonwealth") created and existing pursuant to Chapter 465 of the Acts of 1956, as amended, (the "Enabling Act"). The Authority controls, operates and manages Boston-Logan International Airport ("Logan Airport"), Laurence G. Hanscom Field, Worcester Regional Airport, the Port of Boston and other facilities in the Port of Boston.

The Authority has no stockholders or equity holders, and the Authority's financial statements are not a component unit of the Commonwealth's financial statements. The provisions of the Enabling Act and the Trust Agreement, dated as of August 1, 1978 as amended and supplemented (the "1978 Trust Agreement"), between the Authority and U.S. Bank National Association (as successor in interest to State Street Bank and Trust Company), as trustee (the "Trustee"), the Passenger Facility Charges ("PFC") Revenue Bond Trust Agreement dated May 6, 1999, as amended and supplemented (the "PFC Trust Agreement"), between the Authority and The Bank of New York Mellon, as trustee (the "PFC Trustee") and the Customer Facility Charges ("CFC") Revenue Bond Trust Agreement dated May 18, 2011, as amended and supplemented (the "CFC Trust Agreement"), between the Authority and U.S. Bank National Association as trustee (the "CFC Trustee"), govern all funds, with limited exceptions, received by the Authority pursuant to the Enabling Act.

In April 1981, the Authority adopted a retiree benefit plan whereby the Authority assumed the full cost of group health insurance including basic life insurance, dental insurance and catastrophic illness coverage to those retirees and surviving spouses (and qualifying dependents) who have retired under the Authority's retirement system (collectively referred to as the "OPEB Plan"). In June 2009 and May 2016, the Board made changes to the plan benefits to be paid by the Authority for certain existing and future retirees. For additional details see Note 7.

In June 2008, the Authority created the Retiree Benefits Trust (the "RBT" or the "Trust") to fund its OPEB Plan obligations. It was established as an irrevocable governmental trust under Section 115 of the Internal Revenue Code. In no event shall any part of the principal or income of the RBT be paid or revert back to the Authority or be used for any purpose whatsoever other than for the exclusive benefit of retirees and their beneficiaries.

#### Basis of Accounting

The Authority's activities are accounted in a manner similar to that often utilized in the private sector. The Authority's financial statements are prepared using the accrual basis of accounting and the economic resources measurement focus in accordance with U.S. generally accepted accounting principles ("GAAP").

Revenues from airlines, rentals, parking fees, tolls and concessions are reported as operating revenues. Capital grants, PFC's, CFC's and financing or investing related transactions are

# MASSACHUSETTS PORT AUTHORITY

## Notes to Financial Statements

June 30, 2016 and 2015

reported as non-operating revenues and expenses. All expenses related to operating the Authority's facilities are reported as operating expenses.

### **Accounting per Applicable Trust Agreements**

Under the 1978 Trust Agreement, cash of the Authority is deposited daily into the Revenue Fund established pursuant to the 1978 Trust Agreement and is transferred to the cash concentration account. All such revenues are then transferred to the various funds established pursuant to the 1978 Trust Agreement. After providing for operating expenses, including pension expense and transfers to the self insurance account, cash revenues are then transferred to the Interest and Sinking Fund, which are applied to debt service on any outstanding revenue bonds, the Maintenance Reserve Fund, the Payment In Lieu of Taxes Fund, the Capital Budget Fund, if applicable, and finally, the Improvement and Extension Fund.

PFC revenue is deposited in the PFC Pledged Revenue Fund established pursuant to the PFC Revenue Bond Trust Agreement and is utilized to pay debt service on PFC Revenue Bonds as required in the PFC Trust Agreement. Any remaining funds are transferred to the PFC Capital Fund.

CFC revenue is deposited in the CFC Revenue Fund established pursuant to the CFC Trust Agreement and are utilized to pay debt service on CFC Special Facilities Bonds as required in the CFC Trust Agreement. Any remaining funds are transferred to the CFC Stabilization Fund.

See Note 2 for a reconciliation between the increase in net position as calculated per GAAP and net revenues as calculated per accounting practices prescribed by the 1978 Trust Agreement.

### **a) Net Position**

The Authority follows the "business type" activity requirements of GASB Statement No. 34, *Basic Financial Statements and Management's Discussion and Analysis for State and Local Governments*, which requires that resources be classified for accounting and reporting purposes into the following three net position components:

- Net investment in capital assets: Capital assets, net of accumulated depreciation and outstanding principal balances of debt and the deferred outflows / inflows attributable to the acquisition, construction or improvement of those assets.
- Restricted: Net position of assets whose use by the Authority is subject to externally imposed stipulations that can be fulfilled by actions of the Authority pursuant to those stipulations or that expire by the passage of time. Such assets include the construction funds held pursuant to the 1978 Trust Agreement, the PFC Trust Agreement, the CFC Trust Agreement and the self insurance fund.
- Unrestricted: Net position of assets that are not subject to externally imposed stipulations. Net amounts of assets, deferred outflows of resources, liabilities and deferred inflows of resources not included in the determination of net investment in capital assets or restricted components of net position. Unrestricted net position may be designated for specific purposes by action of management or the Members of the Authority (the "Board") or may

## MASSACHUSETTS PORT AUTHORITY

### Notes to Financial Statements

June 30, 2016 and 2015

otherwise be limited by contractual agreements with outside parties. When both restricted and unrestricted resources are available for a particular restricted use, it is the Authority's policy to use restricted resources first, and then unrestricted resources as needed.

#### **b) *Deferred outflows/inflows of resources***

In addition to assets, the statement of financial position will sometimes report a separate section for deferred outflows of resources. This separate financial statement element, deferred outflows of resources, represents a consumption of net position that applies to a future period and so will not be recognized as an outflow of resources (expense/expenditure) until then. At June 30, 2016, the Authority has four items that qualify for reporting in this category. The first deferred outflow results from refunding long term debt and is the difference in the carrying value of refunded debt and its reacquisition price. This amount is deferred and amortized over the shorter of the life of the refunded or refunding debt. The second item is related to the difference in the expected vs actual experience of the Pension Plan. This amount is deferred and amortized over approximately seven years. The third item is related to the change in Pension Plan assumptions, the reduction in the discount rate, which is being amortized over approximately seven years. The fourth item is related net deferred loss on Pension Plan investments which are being amortized over a five year period.

In addition to liabilities, the statement of financial position will sometimes report a separate section for deferred inflows of resources. This separate financial statement element, deferred inflows of resources, represents an acquisition of net position that applies to a future period and so will not be recognized as an inflow of resources (revenue) until that time. At June 30, 2016, the Authority has one item that qualifies for reporting in this category. The deferred inflow results from refunding long term debt and is the difference in the carrying value of refunded debt and its reacquisition price. This amount is deferred and amortized over the shorter of the life of the refunded or refunding debt. At June 30, 2015, the Authority has deferred inflows of resources related to net deferred gains on Pension Plan investments which are being amortized over a five year period.

#### **c) *Cash and Cash Equivalents***

For purposes of the statements of cash flows, the Authority considers all highly liquid investments, including restricted assets, with an original maturity date of thirty days or less to be cash equivalents.

#### **d) *Investments***

Investments with a maturity greater than one year are recorded at their fair value with all investment income, including changes in the fair value of investments, reported as investment income in the financial statements. Investments with a maturity date of less than one year are carried at amortized cost, which approximates fair value. Fair value equals quoted market prices. The Authority recorded an unrealized holding gain of \$2.0 million and a realized gain of \$0.1 million at June 30, 2016 and an unrealized holding gain of \$0.4 million and a realized gain of \$0.1 million at June 30, 2015.



# MASSACHUSETTS PORT AUTHORITY

## Notes to Financial Statements

June 30, 2016 and 2015

### e) *Restricted Cash and Investments*

Certain cash, cash equivalents and investments are restricted for use by the 1978 Trust Agreement, the PFC Trust Agreement, the CFC Trust Agreement, and other external requirements. These amounts have been designated primarily for expenditures related to future construction or asset acquisitions, debt service and debt service reserves.

### f) *Capital Assets*

Capital assets are recorded at historical cost. Such costs include, where appropriate, capitalized interest and related legal costs. The costs of normal upkeep, maintenance, and repairs are not capitalized.

The capitalization threshold is noted below:

<u>Asset Category</u>	<u>Dollar Threshold</u>
Buildings	\$ 10,000
Machinery & Equipment	5,000
Equipment Repair/Overhaul (Major)	25,000
Runway, Roadways & Other Paving	50,000
Land Improvements	50,000

The Authority capitalizes certain interest costs associated with taxable and tax exempt borrowing, less any interest earned on the proceeds of those borrowings, during the period of construction. Interest expense of \$6.4 million and \$4.5 million, reduced by interest income of \$150.0 thousand and \$33.6 thousand resulted in capitalized interest of \$6.2 million and \$4.4 million for the years ended June 30, 2016 and 2015, respectively.

### g) *Depreciation*

The Authority provides for depreciation using the straight-line method. Depreciation is intended to distribute the cost of depreciable properties over the following estimated useful lives:

<u>Asset Category</u>	<u>Years</u>
Buildings	25
Runways (original construction)	25
Other airfield paving	12
Roadway	25
Machinery and equipment	5 to 10
Land use rights	30

## MASSACHUSETTS PORT AUTHORITY

### Notes to Financial Statements

June 30, 2016 and 2015

#### ***h) Other Assets and Prepaid Items***

Other assets consist of certain payments to vendors reflecting costs applicable to future accounting periods and are recorded as prepaid items in the financial statements.

#### ***i) Amortization***

Revenue bond premiums and discounts are deferred and amortized on a straight-line basis over the term of the bonds, as this approximates the effective interest method. Unamortized amounts are presented as a (reduction) addition of the face amount of bonds payable.

The difference between the reacquisition price and net carrying amount of defeased bonds is amortized on the straight-line method over the shorter of the maturity of the new debt or the defeased debt and is recorded as deferred outflows of resources on the statement of net position.

#### ***j) Revenue Recognition***

Fees and other services consist of parking fees, landing fees, and container handling fees. Revenues from parking fees and container handling fees are recognized at the time the service is provided. Landing fees are recognized as part of operating revenue when airline related facilities are utilized and are principally based on the landed weight of the aircraft. The scheduled airline fee structure is determined and approved annually by the Board and is based on full cost recovery pursuant to an arrangement between the Authority and the respective airlines.

Rental and concession fees are generated from airlines, rental car companies, and other commercial tenants. Rental revenue on leases is recognized over the term of the associated lease. Concession revenue is recognized partially based on self-reported concession revenue by the tenants and partially based on minimum rental rates. Unearned revenue consists primarily of amounts received in advance for future rents or other services. These amounts are recognized as revenue as they are earned over the applicable period.

Rates and charges are set annually based on the budgeted operating costs and actual capital costs. A true-up calculation is performed for landing fees, terminal rents, and baggage fees at year-end based on the actual results. In the event the actual costs are more than the budgeted amounts for the year, the Authority will recover additional rates and charges. In the event the actual costs are less than the budgeted amounts, the Authority will issue credits to the respective airlines.

The Authority presents its accounts receivable at the expected net realizable value. Accordingly, the Authority has recorded an allowance for doubtful accounts against its accounts receivable of \$2.0 million and \$1.5 million at June 30, 2016 and 2015, respectively.

## MASSACHUSETTS PORT AUTHORITY

### Notes to Financial Statements

June 30, 2016 and 2015

#### **k) Passenger Facility Charges**

In 1993, the Authority received initial approval from the Federal Aviation Administration ("FAA") to impose a \$3.00 PFC at Logan Airport. PFCs collected by the Authority can be used for capital projects determined by the FAA to be eligible in accordance with the Aviation Safety and Capacity Expansion Act of 1990. Effective October 1, 2005, the Authority received approval from the FAA to increase the PFC collection to \$4.50. All PFC's collected by the Authority are presently pledged under the PFC Trust Agreement with The Bank of New York Mellon.

Through June 30, 2016, the Authority had cumulative cash collections of \$1,049.9 million in PFCs, including interest thereon.

As part of the Final Agency Decision issued by the FAA in 2011, the Authority was authorized, but not required, to use up to \$14.4 million per year in PFCs to pay approximately one-third of the debt service on the Terminal A Special Facility bonds. The Authority chose to make this use of PFC revenue in order to offset the increase in Terminal A rates and charges that would have resulted from the scheduled increase in Terminal A debt service associated with the beginning of principal payments on January 1, 2012 for the Terminal A bonds. This use of PFCs will maintain the rate consistency across all terminals and facilitate the Authority's ability to assign carriers to Terminal A.

At June 30, 2016, the Authority's collection authorization and total use approval is \$1.67 billion.

As of June 30, 2016 and 2015, \$75.2 million and \$92.7 million of PFC bonds were outstanding, respectively.

Revenues derived from the collection of PFCs are recognized on the accrual basis, based on the month the charges were levied and collected by the airlines. Due to their restricted use, PFCs are categorized as non-operating revenues. The Authority recognized \$70.7 million and \$65.8 million in PFC revenue for the fiscal years ended June 30, 2016 and 2015, respectively.

## MASSACHUSETTS PORT AUTHORITY

### Notes to Financial Statements

June 30, 2016 and 2015

#### ***l) Customer Facility Charges***

Effective December 1, 2008, the Board established a CFC of \$4.00 per day for rental cars which originated out of Logan Airport. Effective December 1, 2009, this charge was increased to \$6.00 per day. The proceeds of the CFC are being used to finance the Rental Car Center (the "RCC") and associated bus purchases. Revenues derived from the collection of CFCs are recognized on the accrual basis, based on the month the charges were levied and collected by the rental car companies. Due to their restricted use, CFCs are categorized as non-operating revenues. Pursuant to the CFC Trust Agreement dated May 18, 2011 between the Authority and U.S. Bank National Association, as trustee, the Authority issued two series of Special Facilities Revenue Bonds in June 2011 (the "Series 2011 Bonds"). The Series 2011 Bonds were issued for the purpose of providing funds sufficient, together with other available funds of the Authority, to finance the development and construction of the RCC and related improvements at Logan Airport, fund certain deposits to the Debt Service Reserve Fund and the Supplemental Reserve Fund, and pay certain costs of issuance of the Series 2011 Bonds. The Series 2011 Bonds and any additional bonds that may be issued under the CFC Trust Agreement on parity with the Series 2011 Bonds are secured by CFC Pledged Revenues and by Contingent Rent, if any, payable by the rental car companies and other funds. The Series 2011 Bonds are not secured by any other revenues of the Authority. The Authority recognized \$32.3 million and \$30.8 million in CFC revenue for the fiscal years ended June 30, 2016 and 2015, respectively. As of June 30, 2016 and 2015, \$201.7 million and \$205.0 million of CFC bonds were outstanding, respectively.

#### ***m) Capital Contributions***

The Authority receives capital contributions from federal and state in support of specific operational programs and its Capital Program. Grant revenues are recognized as related expenditures are incurred and all eligibility requirements are met. Grants for capital asset acquisition, facility development, runway / airfield rehabilitation and long-term planning are reported as capital contributions. Capital contributions are reported in the Statement of Revenues, Expenses and Changes in Net Position after non-operating revenues and expenses and their use is restricted. In each of the fiscal years 2016 and 2015, the Authority recognized \$56.0 million of capital contributions primarily generated from Transportation Security Administration (TSA) reimbursements for the CBIS at Logan Airport and reimbursements under the FAA AIP grant program.

#### ***n) Compensated Absences***

The Authority accrues for vacation and sick pay liabilities when they are earned by the employee. The liability for vested vacation and sick pay is reflected in the accompanying statements of net position as compensated absences. The current portion of compensated absences at June 30, 2016 and 2015 was \$1.4 million. The table below presents the Authority's compensated absences activity at June 30, 2016 and 2015 and for the years then ended (in thousands):

# MASSACHUSETTS PORT AUTHORITY

## Notes to Financial Statements

June 30, 2016 and 2015

	<u>2016</u>	<u>2015</u>
Liability balance, beginning of year	\$ 19,520	\$ 20,457
Vacation and sick pay earned during the year	15,042	13,312
Vacation and sick pay used during the year	<u>(15,026)</u>	<u>(14,249)</u>
Liability balance, end of year	<u>\$ 19,536</u>	<u>\$ 19,520</u>

### ***o) Pensions***

For purposes of measuring the net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the fiduciary net position of the Massachusetts Port Authority Employees Retirement System (the "Plan") and additions to/deductions from Plan's fiduciary net position have been determined on the same basis as they are reported by the Plan. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. Investments are reported at fair value.

### ***p) Use of Estimates***

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenditures during the reporting period. Actual results could differ from those estimates.

### ***q) Interfund Transactions***

In fiscal year 2014, the Authority loaned the CFC Trust Agreement \$10.0 million at 6.167% interest to complete the construction of the RCC. During fiscal years 2016 and 2015, the CFC Trust repaid the Authority \$6.0 and \$4.0 million on this loan, respectively. This transaction generated \$0.06 million and \$0.6 million in interest income and expense during fiscal years 2016 and 2015, respectively, that has been eliminated in the combining schedules. Additionally, all interfund amounts have been eliminated in the combining statements.

### ***r) New Accounting Pronouncements***

In January 2013, GASB issued Statement No. 69, Government Combinations and Disposals of Government Operations ("GASB No. 69"). This Statement establishes accounting and financial reporting standards related to government combinations and disposals of government operations. As used in this Statement, the term government combinations include a variety of transactions referred to as mergers, acquisitions, and transfers of operations. The distinction between a government merger and a government acquisition is based upon whether an exchange of significant consideration is present within

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the combination transaction. Government mergers include combinations of legally separate entities without the exchange of significant consideration. This Statement requires the use of carrying values to measure the assets and liabilities in a government merger. Conversely, government acquisitions are transactions in which a government acquires another entity, or its operations, in exchange for significant consideration. This Statement requires measurements of assets acquired and liabilities assumed generally to be based on their acquisition values. This Statement also provides guidance for transfers of operations that do not constitute entire legally separate entities and in which no significant consideration is exchanged. This Statement defines the term operations for purposes of determining the applicability of this Statement and requires the use of carrying values to measure the assets and liabilities in a transfer of operations.

A disposal of a government's operations results in the removal of specific activities of a government. This Statement provides accounting and financial reporting guidance for disposals of government operations that have been transferred or sold.

This Statement requires disclosures to be made about government combinations and disposals of government operations to enable financial statement users to evaluate the nature and financial effects of those transactions.

The requirements of this Statement are effective for government combinations and disposals of government operations occurring in financial reporting periods beginning after December 15, 2013, and should be applied on a prospective basis.

The Authority adopted this Statement and there was no impact on its financial statements.

In February 2015, GASB issued Statement No. 72, *Fair Value Measurement and Application*. ("GASB No. 72"). The objective of this Statement is to address accounting and financial reporting issues related to fair value measurements. This Statement will enhance comparability of financial statements among governments by requiring measurement of certain assets and liabilities at fair value using a consistent and more detailed definition of fair value and accepted valuation techniques. This Statement also will enhance fair value application guidance and related disclosures in order to provide information to financial statement users about the impact of fair value measurements on a government's financial position. The definition of *fair value* is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. This Statement provides guidance for determining a fair value measurement for financial reporting purposes. This Statement also provides guidance for applying fair value to certain investments and disclosures related to all fair value measurements. The requirements of this Statement are effective for financial statements for periods beginning after June 15, 2015.

The Authority adopted this Statement on July 1, 2015, and as of June 30, 2016. The disclosures required by this Statement are included in Note 3.

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In June 2015, GASB issued Statement No. 73, *Accounting and Financial Reporting for Pensions and Related Assets that are not within the scope of GASB Statement 68, and amendments to certain provisions of GASB Statements 67 and 68*. (“GASB No. 73”). The objective of this Statement is to improve the usefulness of information about pensions included in the general purpose external financial reports of state and local governments for making decisions and assessing accountability. This Statement results from a comprehensive review of the effectiveness of existing standards of accounting and financial reporting for all postemployment benefits with regard to providing decision-useful information, supporting assessments of accountability and interperiod equity, and creating additional transparency.

This Statement establishes requirements for defined benefit pensions that are not within the scope of Statement No. 68, *Accounting and Financial Reporting for Pensions*, as well as for the assets accumulated for purposes of providing those pensions. In addition, it establishes requirements for defined contribution pensions that are not within the scope of Statement 68. It also amends certain provisions of Statement No. 67, *Financial Reporting for Pension Plans*, and Statement 68 for pension plans and pensions that are within their respective scopes. The requirements of this Statement extend the approach to accounting and financial reporting established in Statement 68 to all pensions, with modifications as necessary to reflect that for accounting and financial reporting purposes, any assets accumulated for pensions that are provided through pension plans that are not administered through trusts that meet the criteria specified in Statement 68 should not be considered pension plan assets. It also requires that information similar to that required by Statement 68 be included in notes to financial statements and required supplementary information by all similarly situated employers and nonemployer contributing entities. This Statement also clarifies the application of certain provisions of Statements 67 and 68 with regard to the following issues:

1. Information that is required to be presented as notes to the 10-year schedules of required supplementary information about investment-related factors that significantly affect trends in the amounts reported.
2. Accounting and financial reporting for separately financed specific liabilities of individual employers and nonemployer contributing entities for defined benefit pensions.
3. Timing of employer recognition of revenue for the support of nonemployer contributing entities not in a special funding situation.

The requirements of this Statement that address accounting and financial reporting by employers and governmental nonemployer contributing entities for pensions that are not within the scope of Statement 68 are effective for financial statements for fiscal years beginning after June 15, 2016, and the requirements of this Statement that address financial reporting for assets accumulated for purposes of providing those pensions are effective for fiscal years beginning after June 15, 2015. The requirements of this Statement for pension plans that are within the scope of Statement No. 67 or for pensions that are within the scope of Statement No. 68 are effective for fiscal years beginning after June 15,

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2015. Earlier application is encouraged. The requirements of this Statement will improve financial reporting by establishing a single framework for the presentation of information about pensions, which will enhance the comparability of pension-related information reported by employers and nonemployer contributing entities.

The Authority adopted this Statement and there was no impact on its financial statements.

In June 2015, GASB issued Statement No. 74, *Financial Reporting for Postemployment Plans Other Than Pension Plans*. ("GASB No. 74"). The objective of this Statement is to improve the usefulness of information about postemployment benefits other than pensions (other postemployment benefits or OPEB) included in the general purpose external financial reports of state and local governmental plans for making decisions and assessing accountability. Statement 74 replaces GASB Statement No. 43, *Financial Reporting for Postemployment Benefit Plans Other Than Pension Plans*. Statement 74 addresses the financial reports of defined benefit OPEB plans that are administered through trusts that meet specified criteria. The Statement follows the framework for financial reporting of defined benefit OPEB plans in Statement 45 by requiring a statement of fiduciary net position and a statement of changes in fiduciary net position. The Statement requires more extensive note disclosures and RSI related to the measurement of the OPEB liabilities for which assets have been accumulated, including information about the annual money-weighted rates of return on plan investments. Statement 74 also sets forth note disclosure requirements for defined contribution OPEB plans. The requirements of this Statement are effective for financial statements for periods beginning after June 15, 2016.

The Authority is currently evaluating the impact of the implementation of GASB No. 74 on its financial statements.

In June 2015, GASB issued Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions* ("GASB No. 75"). The objective of this Statement is to address reporting by governments that provide OPEB to their employees and for governments that finance OPEB for employees of other governments. The requirements of this Statement are effective for financial statements for periods beginning after June 15, 2017.

The Authority is currently evaluating the impact of the implementation of GASB No. 75 on its financial statements.

In June 2015, GASB issued Statement No. 76, *The Hierarchy of Generally Accepted Accounting Principles for State and Local Governments*, ("GASB No. 76"). This Statement reduces the GAAP hierarchy to two categories of authoritative GAAP from the four categories under GASB Statement No. 55, *The Hierarchy of Generally Accepted Accounting Principles for State and Local Governments*. The first category of authoritative GAAP consists of GASB Statements of Governmental Accounting Standards. The second category comprises GASB Technical Bulletins and Implementation Guides, as well as guidance from the American Institute of Certified Public Accountants that is cleared by the GASB.



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The Statement also addresses the use of authoritative and nonauthoritative literature in the event that the accounting treatment for a transaction or other event is not specified within a source of Authoritative GAAP.

These changes are intended to improve financial reporting for governments by establishing a framework for the evaluation of accounting guidance that will result in governments applying that guidance with less variation. The Statement will also improve the usefulness of financial statement information for making decisions and assessing accountability and enhance the comparability of financial statement information among governments. The Statement also improves implementation guidance by elevating its authoritative status to a level that requires it be exposed for a period of broad public comment prior to issuance, as is done for other GASB pronouncements. The requirements of this Statement are effective for financial statements for periods beginning after June 15, 2015.

The Authority adopted this Statement and there was no impact on its financial statements.

In December 2015, GASB issued Statement No. 79, *Certain External Investment Pools and Pool Participants* ("GASB No. 79"). This Statement addresses accounting and financial reporting for certain external investment pools and pool participants. Specifically, it establishes criteria for an external investment pool to qualify for making the election to measure all of its investments at amortized costs for financial reporting purposes. An external investment pool qualifies for that reporting if it meets all of the applicable criteria established in this Statement. The specific criteria address (1) how the external investment pool transacts with participants; (2) requirements for portfolio maturity, quality, diversification, and liquidity; and (3) calculation and requirements of a shadow price. Significant noncompliance prevents the external pool from measuring all of its investments at amortized cost for financial reporting purposes. Professional judgment is required to determine if instances of noncompliance with the criteria established by this Statement during the reporting period, individually or in the aggregate, were significant.

If the external investment pool does not meet the criteria established by this Statement, that pool should apply the provisions in paragraph 16 of Statement No. 31, *Accounting and Financial Reporting for Certain Investments and for External Investment Pools*, as amended. If an external investment pool meets the criteria in this Statement and measures all of its investments at amortized costs, the pool's participants also should measure their investments in that external pool at amortized cost for financial reporting purposes. If an external investment pool does not meet the criteria in this Statement, the pool's participants should measure their investments in the pool at the fair value, as provided in paragraph 11 of Statement 31, as amended.

This Statement establishes additional note disclosure requirements for qualifying external investment pools that measure all of their investments at amortized costs for financial reporting purposes and for governments that participate in those pools. Those disclosures for both the qualifying external investment pools and their participants include information about any limitations or restrictions on participant withdrawals.

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The requirements of this Statement are effective for reporting periods beginning after June 15, 2015, except for certain provisions on portfolio quality, custodial credit risk and shadow pricing. Those provisions are effective for reporting periods beginning after December 15, 2015.

The Authority adopted this Statement and there was no impact on its financial statements.

In January 2016, GASB issued Statement No. 80, *Blending Requirements for Certain Component Units, an amendment of GASB Statement No. 14*, (“GASB No. 80”). The objective of this Statement is to improve financial reporting by clarifying the financial statement presentation requirements for certain component units. This Statement amends the blending requirements established in paragraph 53 of Statement No. 14, *The Financial Reporting Entity, as amended*. The additional criterion requires blending of a component unit incorporated as a not-for-profit corporation in which the primary government is the sole corporate member. The additional criterion does not apply to component units included in the financial reporting entity pursuant to the provisions of Statement No. 39, *Determining Whether Certain Organizations are Component Units*. The requirements of this Statement are effective for financial statements for periods beginning after June 15, 2016.

The Authority does not believe this Statement will have any effect on its financial statements.

In March 2016, GASB issued Statement No. 81, *Irrevocable Split-Interest Agreements*, (“GASB No. 81”). The objective of this Statement is to improve accounting and financial reporting for irrevocable split-interest agreements by providing recognition and measurement guidance for situations in which a government is a beneficiary of the agreement. Split-interest agreements are a type of giving agreement used by donors to provide resources to two or more beneficiaries, including governments. Split-interest agreements can be created through trusts –or other legally enforceable agreements with the characteristics that are equivalent to split-interest agreements –in which the donor transfers resources to an intermediary to hold and administer for the benefit of a government and at least one other beneficiary. The requirements of this Statement are effective for financial statements for periods beginning after December 15, 2016.

The Authority does not believe this Statement will have any effect on its financial statements.

In March 2016, GASB issued Statement No. 82, *Pension Issues*, (“GASB No. 82”). The objective of this Statement is to address certain issues that have been raised with respect to Statements No. 67, *Financial Reporting for Pension Plans*, No. 68 *Accounting and Financial Reporting for Pensions*, and No. 73, *Accounting and Financial Reporting for Pension and Related Assets That Are Not within the Scope of GASB Statement 68, and Amendments to Certain Provisions of GASB Statements 67 and 68*. Specifically, this Statement addresses issues regarding (1) the presentation of payroll-related measures in required supplementary information, (2) the selection of assumptions and the treatment of deviations from the guidance in an Actuarial Standard of Practice for financial reporting

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### Notes to Financial Statements

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purposes, and (3) the classification of payments made by employers to satisfy employee (plan member) contribution requirements. The requirements of this Statement are effective for financial statements for periods beginning after June 15, 2016, except for the requirements of this Statement for the selection of assumptions in a circumstance in which an employer's pension liability is measured as of a date other than the employer's most recent fiscal year end. In that circumstance, the requirements for the selection of assumptions are effective for the employer in the first reporting period in which the measurement date of the pension liability is on or after June 15, 2017.

The Authority adopted this Statement and there was no impact on its financial statements.

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### Notes to Financial Statements

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#### 2. Reconciliation between increase in net position as calculated under GAAP and net revenues as calculated under accounting practices prescribed by the 1978 Trust Agreement

Presented below are the calculations of the net revenues of the Authority under the 1978 Trust Agreement. Net revenue calculated based on the 1978 Trust Agreement is used in determining the Authority's compliance with the debt service coverage ratio (in thousands).

	<u>2016</u>	<u>2015</u>
<b>Increase in Net Position per GAAP</b>	\$ 105,306	\$ 107,426
Additions:		
Depreciation and amortization	247,502	227,158
Interest expense	63,613	64,829
Payments in lieu of taxes	19,375	19,282
Other operating expenses	5,025	5,409
Terminal A bonds - debt service contribution	11,903	10,918
OPEB expenses, net	2,093	654
Settlement of claims	(70)	-
Pension expense	4,711	-
Less:		
Passenger facility charges	(70,718)	(65,807)
Customer facility charges	(32,335)	(30,768)
Self insurance expenses	(821)	(612)
Capital grant revenue	(56,033)	(55,953)
Pension expense	-	(8,956)
Net decrease (increase) in the fair value of investments	(2,116)	(527)
Loss (gain) on sale of equipment	595	(180)
Other (revenues) expenses	(1,269)	(2,076)
Other non-operating revenues	67	(9,135)
Investment income	<u>(3,764)</u>	<u>(3,575)</u>
 <b>Net Revenue per the 1978 Trust Agreement</b>	 <u>\$ 293,064</u>	 <u>\$ 258,087</u>

Total net revenues, as defined by the 1978 Trust Agreement, pledged for the repayment of bonds issued under the 1978 Trust Agreement were \$293.1 million and \$258.1 million for the years ended June 30, 2016 and 2015, respectively.

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## Notes to Financial Statements

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### 3. Deposits and Investments

The Authority's investments are made in accordance with the provisions of the 1978 Trust Agreement, the PFC Trust Agreement and the CFC Trust Agreement along with the investment policy adopted by the Board (the "Investment Policy"). The goals of the Investment Policy are, in order of importance, to preserve capital, to provide liquidity and to generate interest income.

As of June 30, 2016 and 2015, all investments were held on behalf of the Authority by the Trustee, the PFC Trustee, the CFC Trustee or custodians in the Authority's name. The 1978 Trust Agreement, the PFC Trust Agreement and the CFC Trust Agreement require that securities collateralizing repurchase agreements must continuously have a fair value at least equal to the cost of the agreement plus accrued interest.

The Authority's investments in forward delivery agreements are in the form of a guaranteed investment contract ("GIC") which provides for, among other things, the sequential delivery of securities to be sold to the Trustee, PFC Trustee, or CFC Trustee, as applicable, periodically at a discount from maturity value such that the aggregate discount equals the interest rate previously agreed to between the Authority and the provider of the guaranteed investment contract.

The total accumulated unrealized gain (loss) due to the changes in fair value of investments related to investments with maturities in excess of one year was a gain of approximately \$3.2 million as of June 30, 2016 and a gain of approximately \$1.1 million as of June 30, 2015.

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The following summarizes the Authority's cash and cash equivalents and investments by type held at June 30, 2016 and 2015 (in thousands):

2016	Credit Rating (1)	Cost	Fair Value	Effective Duration
MMDT (6)	Unrated	\$ 204,708	\$ 204,708	0.003
Federal Home Loan Bank	AA+/Aaa	104,380	105,185	1.832
Federally Insured Cash Account	Unrated (2)	5,002	5,002	0.003
Forward Delivery Agreement (FDA) (6)	AA+ / Aaa	12,329	12,329	0.960
Federal Home Loan Mortgage Corp.	AA+ / Aaa	44,359	44,518	1.236
Federal National Mortgage Association	AA+ / Aaa	95,104	95,666	1.426
Federal Farm Credit	AA+ / Aaa	44,062	44,308	1.508
Guaranteed Investment Contracts (GIC) (6)	AA+ / Aa3 (4)	41,362	41,362	10.790
Cash Deposit	Unrated	287	287	0.003
Certificates of Deposit	AAA / Aaa (3)	38,665	38,665	0.576
Commercial Paper	A-1/ P-1 (5)	179,576	179,576	0.240
Government Fund-Morgan Stanley / Wells Fargo	AAA / Aaa (5)	24,852	24,852	0.003
Municipal Bond	AA+ / Aa1	125,116	126,148	1.624
Money Market Funds	Unrated	1,388	1,388	0.003
Insured Cash Sweep	Unrated (2)	14,226	14,226	0.003
Treasury Notes	AAA / Aaa	34,955	35,304	1.784
Common Stock	Unrated	809	809	0.003
		<u>\$ 971,180</u>	<u>\$ 974,333</u>	

2015	Credit Rating (1)	Cost	Fair Value	Effective Duration
MMDT (6)	Unrated	\$ 196,819	\$ 196,819	0.003
Federal Home Loan Bank	AA+/Aaa	66,085	66,165	1.865
Federally Insured Cash Account	Unrated (2)	15,003	15,003	0.003
Forward Delivery Agreement (FDA) (6)	AA+ / Aaa	12,336	12,336	1.874
Federal Home Loan Mortgage Corp.	AA+ / Aaa	40,357	40,413	1.363
Federal National Mortgage Association	AA+ / Aaa	98,738	98,817	1.558
Federal Farm Credit	AA+ / Aaa	26,040	26,128	1.664
Guaranteed Investment Contracts (GIC) (6)	AA+ / Aa3 (4)	39,728	39,728	11.329
Cash Deposit	Unrated	175,581	175,581	0.003
Certificates of Deposit	AAA / Aaa (3)	19,086	19,086	0.358
Commercial Paper	A-1/ P-1 (5)	132,782	132,782	0.351
Morgan Stanley Government Fund	AAA / Aaa (5)	1,072	1,072	0.003
Municipal Bond	AA+ / Aa1	119,923	120,489	1.943
Money Market Funds	Unrated	19,674	19,674	0.003
Insured Cash Sweep	Unrated (2)	5,033	5,033	0.003
Treasury Notes	AAA / Aaa	30,880	31,137	2.829
		<u>\$ 999,137</u>	<u>\$ 1,000,263</u>	

1. The ratings are from S&P or Moody's as of the fiscal year presented.
2. FDIC Insured Deposits Accounts.
3. Collateralized by Federal Agency Notes or Letter of Credit backed by each reserve.
4. Underlying rating of security held.
5. Credit quality of fund holdings.
6. MMDT, FDA and GIC are carried at cost, which approximates fair value in the tables.

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The table below presents the Authority's cash and cash equivalents and investments based on maturity date (in thousands):

	2016		2015	
	Cost	Fair Value	Cost	Fair Value
Securities maturing in 1 year or more	\$ 428,786	\$ 431,803	\$ 328,369	\$ 329,500
Securities maturing in less than 1 year	291,931	292,067	257,586	257,581
Cash and cash equivalents	250,463	250,463	413,182	413,182
	<u>\$ 971,180</u>	<u>\$ 974,333</u>	<u>\$ 999,137</u>	<u>\$ 1,000,263</u>

#### **Credit Risk**

Credit risk is the risk that the Authority will be negatively impacted due to the default of the security issuer or investment counterparty.

The Authority's 1978 Trust Agreement, PFC Trust Agreement and CFC Trust Agreement each stipulate that, in addition to U.S. Treasury and government agency obligations, only certain highly rated securities are eligible investments, including bonds or obligations of any state or political subdivision thereof, rated in the two highest rating categories without regard to gradations within rating categories, by both Moody's (AAA, Aa1, Aa2 and Aa3) and S&P (AAA, AA+, AA, and AA-); commercial paper of a U.S. corporation, finance company or money market funds rated in the highest rating category, without regard to gradations within categories, by both Moody's and S&P; and investment contracts with banks whose long-term unsecured debt rating is in one of the two highest rating categories by both Moody's and S&P. In addition, U.S. dollar denominated corporate bonds, notes or other debt obligations issued or guaranteed by a domestic or foreign corporation, financial institution, non-profit or other entity rated in one of the three highest rating categories, without regard to gradations within such categories by Moody's and S&P.

#### **a) Custodial Credit Risk – Deposits**

The custodial credit risk for deposits is the risk that in the event of a bank failure, the Authority's deposits may not be recovered. Bank deposits in excess of the insured amount are uninsured and uncollateralized.

The Authority maintains depository accounts with Bank of America, N.A., Wells Fargo Bank, N.A., TD Bank, N.A. and The Bank of New York Mellon, the PFC Trustee. The Authority maintains a payroll disbursement, lockbox and collection accounts (for other than PFCs) with Bank of America, N.A. None of these accounts are collateralized.

The Authority's cash on deposits in the banks noted above at June 30, 2016 and 2015 was \$0.29 million and \$176.3 million, respectively, and of these amounts \$0.75 million was

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insured in each year, and no amount was collateralized at June 30, 2016 or 2015. The balance at June 30, 2015 included \$174.7 million related to the issuance of the 2015 Series C Revenue Refunding Bonds on June 30, 2015. The bond proceeds were used to refund the entire outstanding balance of the 2005 Series C Revenue Bonds.

### **b) Custodial Credit Risk – Investments**

Custodial credit risk is the risk that, in the event of a failure of the counterparty, the Authority would not be able to recover the value of its investments or collateral securities that were in the possession of an outside party. Investment securities are exposed to custodial credit risk if they are uninsured or not registered in the name of the Authority and are held by either the counterparty or, the counterparty's trust department or agent, but not in the Authority's name.

The Authority is authorized by the 1978 Trust Agreement, the PFC Trust Agreement, the CFC Trust Agreement and the Investment Policy to invest in obligations of the U.S. Treasury, including obligations of its agencies and instrumentalities, bonds and notes of public agencies or municipalities, bank time deposits, guaranteed investment contracts, money market accounts, commercial paper of a U.S. corporation or finance company and corporate bonds. All investments are held by a third party in the Authority's name. These investments are recorded at fair value.

Additionally, the Authority is authorized to invest in the Massachusetts Municipal Depository Trust ("MMDT"), a pooled money market like investment fund managed by the Commonwealth of Massachusetts, established under the General Laws, Chapter 29, Section 38A. MMDT investments are carried at amortized cost, which approximates fair value which is the same as the value of the pool. The Authority can purchase and sell its investments at any time without penalty.

The following guaranteed investment contracts were in force as of June 30, 2016 and 2015, respectively; they are uncollateralized and recorded at cost:

<b>Investment Agreement</b>				
<b>Provider</b>	<b>Rate</b>	<b>Maturity</b>	<b>2016</b>	<b>2015</b>
Trinity Plus Funding Company	4.360%	January 2, 2031	\$ 18,199	\$ 17,427
GE Funding Capital Markets	3.808%	December 31, 2030	23,163	22,301
	Total		\$ 41,362	\$ 39,728

### **c) Concentration of Credit Risk – Investments**

Concentration of credit risk is assumed to arise when the amount of investments that the Authority has with any one issuer exceeds 5% of the total value of the Authority's investments. The Authority consults with its Investment Advisor to select Commercial Paper Issuers with strong credit ratings. The book values of portions of the Authority-wide portfolio, excluding investments issued by MMDT, the FDIC, or U.S. Government



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### Notes to Financial Statements

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guaranteed obligations and the underlying securities held under forward delivery agreements at cost, that exceed 5% of the portfolio are as follows (in thousands):

<u>Commercial Paper Issuer</u>	<u>2016</u>	<u>2015</u>
Bank of Tokyo Mitsubishi UFJ	\$ 46,859	\$ -
General Electric	-	15,988
JP Morgan Chase	45,902	40,882
Societe Generale	-	24,953
Credit Agricole	28,990	24,974
Toyota Motor Corporation	47,841	20,987
UBS	9,984	4,998
Total	<u>\$ 179,576</u>	<u>\$ 132,782</u>
% of Portfolio	<u>18.54%</u>	<u>13.27%</u>

#### **d) Credit Ratings– Investments**

The 1978 Trust Agreement, the PFC Trust Agreement, the CFC Trust Agreement and the Board approved Investment Policy generally limit the Authority in the types of investments it can purchase to the two highest rating categories without regard to gradations within the rating categories by both Moody's (Aaa, Aa1, Aa2, and Aa3) and S&P (AAA, AA+, AA, and AA-) and in corporate bonds rated in one of the three highest rating categories without regard to gradations within such categories by Moody's and S&P.

Investments in bank certificates of deposits were fully collateralized. Also, the Authority invested in MMDT, managed by the State Treasury, which is not rated.

#### **e) Interest Rate Risk – Investments**

Interest rate risk is the risk that changes in interest rates will adversely affect the fair market value of an investment. The Authority has set targets for the preferred maturity structure of the investments held in each fund and account, and also sets targets each quarter for the effective duration for each fund that reflect the need for liquidity and the expected tradeoffs between yield and term for each different fund and account. It is the Authority's practice to hold investments until maturity in order to insulate the Authority's investment earnings from interest rate risk. The Authority mitigates interest rate risk by managing the weighted average maturity of each portfolio type to best meet its liquidity needs.

#### **f) Cash, Cash Equivalents and Investments by Fund**

The following summarizes cash and investments, at cost and fair value, as of June 30, by the various funds and accounts established by the Authority for debt covenant requirements

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and other purposes. In the following table, the fair value of MMDT, FDA and GIC approximate their costs (in thousands):

	2016		2015	
	Cost	Fair Value	Cost	Fair Value
<b>1978 Trust</b>				
Improvement and Extension Fund	\$ 213,820	\$ 214,769	\$ 149,187	\$ 149,657
Capital Budget Account	54,565	54,565	62,488	62,488
Debt Service Reserve Funds	108,295	109,144	102,648	102,714
Debt Service Funds	74,083	74,083	71,571	71,571
Maintenance Reserve Fund	181,697	182,422	153,831	154,156
Operating/Revenue Fund	69,272	69,272	58,609	58,609
Subordinated Debt Funds	43,759	43,759	42,124	42,124
Self-Insurance Account	30,672	30,969	29,195	29,365
2012 A Project Fund	-	-	78	78
2014 B Project Fund	4,431	4,431	27,845	27,845
2015 C Redemption Fund	-	-	174,951	174,951
2015 B Project Fund	37,941	37,957	-	-
Other Funds	19,340	19,340	16,865	16,865
<b>1999 PFC Trust</b>				
Debt Service Reserve Funds	20,108	20,120	20,231	20,272
Debt Service Funds	24,259	24,259	20,495	20,495
Other PFC Funds	33,095	33,148	23,096	23,096
<b>2011 CFC Trust</b>				
Debt Service Reserve Funds	28,059	28,274	28,015	28,062
CFC Maintenance Reserve Fund	826	826	-	-
2011-A & B CFC Project Funds	84	84	775	775
Debt Service Funds	9,281	9,281	9,267	9,267
Other CFC Funds	17,593	17,630	7,866	7,873
<b>Total</b>	<b>\$ 971,180</b>	<b>\$ 974,333</b>	<b>\$ 999,137</b>	<b>\$ 1,000,263</b>

**g) Fair Value Measurement**

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is a market-based measurement, not an entity-specific measurement. For some assets and liabilities, observable market transactions or market information might be available; for others, it might not be available. However, the objective of a fair value measurement in both cases is the same—that is, to determine the price at which an orderly transaction to sell the asset or to transfer the liability would take place between market participants at the measurement date under current market conditions. Fair value is an exit price at the measurement date from the perspective of a market participant that controls the asset or is obligated for the liability.

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The fair value hierarchy categorizes the inputs to valuation techniques used to measure fair value into three levels. Level 1 inputs are quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date. Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for an asset or liability, either directly or indirectly. Level 3 inputs are unobservable inputs for an asset or liability. The fair value hierarchy gives the highest priority to Level 1 inputs and the lowest priority to Level 3 inputs.

The following tables show the fair value and the fair value measurements for our cash and cash equivalents and investments, subject to the provisions of GASB No. 72:

#### Cash, Cash equivalents and Investments Measured at Fair Value (in thousands)

<u>As of June 30, 2016</u>	<u>Fair Value</u>	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>
Federal Home Loan Bank	\$ 105,185	\$ -	\$ 105,185	\$ -
Federally Insured Cash Account	5,002	5,002	-	-
Federal Home Loan Mortgage Corp.	44,518	-	44,518	-
Federal National Mortgage Association	95,666	-	95,666	-
Federal Farm Credit	44,308	-	44,308	-
Cash Deposit	287	287	-	-
Certificates of Deposit	38,665	38,665	-	-
Commercial Paper	179,576	-	179,576	-
Government Fund-Morgan Stanley / Wells Fargo	24,852	24,852	-	-
Municipal Bond	126,148	-	126,148	-
Money Market Funds	1,388	1,388	-	-
Insured Cash Sweep	14,226	14,226	-	-
Treasury Notes	35,304	-	35,304	-
Common Stock	809	809	-	-
<b>Total Cash, Cash equivalents and Investments Measured at Fair Value</b>	<b>\$ 715,934</b>	<b>\$ 85,229</b>	<b>\$ 630,705</b>	<b>\$ -</b>

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<u>As of June 30, 2015</u>	<u>Fair Value</u>	<u>Level 1</u>	<u>Level 2</u>	<u>Level 3</u>
Federal Home Loan Bank	\$ 66,165	\$ -	\$ 66,165	\$ -
Federally Insured Cash Account	15,003	15,003	-	-
Federal Home Loan Mortgage Corp.	40,413	-	40,413	-
Federal National Mortgage Association	98,817	-	98,817	-
Federal Farm Credit	26,128	-	26,128	-
Cash Deposit	175,581	175,581	-	-
Certificates of Deposit	19,086	19,086	-	-
Commercial Paper	132,782	-	132,782	-
Morgan Stanley Government Fund	1,072	1,072	-	-
Municipal Bond	120,489	-	120,489	-
Money Market Funds	19,674	19,674	-	-
Insured Cash Sweep	5,033	5,033	-	-
Treasury Notes	31,137	-	31,137	-
<b>Total Cash, Cash equivalents and Investments Measured at Fair Value</b>	<b>\$ 751,380</b>	<b>\$ 235,449</b>	<b>\$ 515,931</b>	<b>\$ -</b>

#### Cash and Money Market Funds

As of June 30, 2016 and 2015, the Authority held positions in various cash and money market funds and the fair values of those funds were \$84.4 million and \$235.4 million, respectively. The fair values of the cash and money market funds were valued using quoted market prices (Level 1).

#### Federal Agency Notes

As of June 30, 2016 and 2015, the Authority held positions in federal agency notes and the fair values were \$289.7 million and \$231.5 million, respectively. The fair values of the federal agency notes were based on a market approach using quoted prices by a third party for markets that are not active (Level 2).

#### Commercial Paper Notes

As of June 30, 2016 and 2015, the Authority held positions in commercial paper notes and the fair values were \$179.6 million and \$132.8 million, respectively. The fair values of the commercial paper notes were based on a market approach using quoted prices by a third party for markets that are not active (Level 2).

#### Municipal Bonds

As of June 30, 2016 and 2015, the Authority held positions in municipal bonds and the fair values were \$126.1 million and \$120.5 million, respectively. The fair values of the municipal bonds were based on a market approach using quoted prices by a third party for markets that are not active (Level 2).

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#### Treasury Notes

As of June 30, 2016 and 2015, the Authority held positions in Treasury Notes and the fair values were \$35.3 million and \$31.1 million, respectively. The fair values of the Treasury Notes were based on a market approach using quoted prices by a third party for markets that are not active (Level 2).

#### Common Stock

As of June 30, 2016, the Authority held a position in common stock and the fair value was \$0.8 million. The fair value of the common stock was valued using a quoted market price (Level 1).

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### Notes to Financial Statements

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#### 4. Capital Assets

Capital assets consisted of the following at June 30, 2016 and 2015 (in thousands):

	<u>June 30, 2015</u>	<u>Additions and Transfers In</u>	<u>Deletions and Transfers Out</u>	<u>June 30, 2016</u>
Capital assets not being depreciated				
Land	\$ 211,444	\$ 16,495	\$ 1,442	\$ 226,497
Construction in progress	217,689	359,923	351,682	225,930
Total capital assets not being depreciated	<u>429,133</u>	<u>376,418</u>	<u>353,124</u>	<u>452,427</u>
Capital assets being depreciated				
Buildings	3,026,969	189,185	29,096	3,187,058
Runway and other paving	807,224	23,322	—	830,546
Roadway	708,092	5,549	—	713,641
Machinery and equipment	434,295	132,714	1,742	565,267
Air rights	183,755	418	—	184,173
Parking rights	46,261	—	—	46,261
Total capital assets being depreciated	<u>5,206,596</u>	<u>351,188</u>	<u>30,838</u>	<u>5,526,946</u>
Less accumulated depreciation:				
Buildings	1,493,838	115,028	16,020	1,592,846
Runway and other paving	434,254	39,754	—	474,008
Roadway	333,090	28,631	—	361,721
Machinery and equipment	280,112	42,541	1,344	321,309
Air rights	112,490	6,972	—	119,462
Parking rights	21,588	1,542	—	23,130
Total accumulated depreciation	<u>2,675,372</u>	<u>234,468</u>	<u>17,364</u>	<u>2,892,476</u>
Total capital assets being depreciated, net	<u>2,531,224</u>	<u>116,720</u>	<u>13,474</u>	<u>2,634,470</u>
Capital assets, net	<u>\$ 2,960,357</u>	<u>\$ 493,138</u>	<u>\$ 366,598</u>	<u>\$ 3,086,897</u>

Depreciation and amortization for fiscal year 2016 and 2015 was \$247.5 million and \$227.2 million, respectively.

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	<u>June 30, 2014</u>	<u>Additions and Transfers In</u>	<u>Deletions and Transfers Out</u>	<u>June 30, 2015</u>
Capital assets not being depreciated				
Land	\$ 202,699	\$ 8,745	\$ —	\$ 211,444
Construction in progress	155,071	287,738	225,120	217,689
Total capital assets not being depreciated	357,770	296,483	225,120	429,133
Capital assets being depreciated				
Buildings	2,910,096	131,808	14,935	3,026,969
Runway and other paving	783,714	23,510	—	807,224
Roadway	691,604	17,073	585	708,092
Machinery and equipment	397,916	41,165	4,786	434,295
Air rights	180,937	2,818	—	183,755
Parking rights	46,261	—	—	46,261
Total capital assets being depreciated	5,010,528	216,374	20,306	5,206,596
Less accumulated depreciation:				
Buildings	1,392,296	110,054	8,512	1,493,838
Runway and other paving	390,375	43,879	—	434,254
Roadway	304,938	28,394	242	333,090
Machinery and equipment	254,667	30,214	4,769	280,112
Air rights	105,332	7,158	—	112,490
Parking rights	20,046	1,542	—	21,588
Total accumulated depreciation	2,467,654	221,241	13,523	2,675,372
Total capital assets being depreciated, net	2,542,874	(4,867)	6,783	2,531,224
Capital assets, net	\$ 2,900,644	\$ 291,616	\$ 231,903	\$ 2,960,357

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Capital assets (excluding construction in progress) at June 30 comprised the following (in thousands):

	<u>2016</u>	<u>2015</u>
Facilities completed by operation:		
Airports	\$ 5,223,876	\$ 4,912,218
Port	<u>513,567</u>	<u>505,822</u>
Capital assets (excluding construction in progress)	<u>\$ 5,737,443</u>	<u>\$ 5,418,040</u>

During fiscal years 2016 and 2015, the Authority completed and placed into service portions of its new Checked Baggage Inspection System ("CBIS"). This project will be completed and placed into service during fiscal years 2015 through 2017. The write off of the old CBIS generated a current period expense of \$13.1 and \$6.4 million in fiscal years 2016 and 2015, respectively, which is included in depreciation expense.



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## Notes to Financial Statements

June 30, 2016 and 2015

### 5. Bonds and Notes Payable

Long-term debt at June 30, 2016 consisted of the following and represents maturities on the Authority's fiscal year basis (in thousands):

	<u>Beginning balance</u>	<u>Additions</u>	<u>Reductions</u>	<u>Ending balance</u>	<u>Due within one year</u>
Revenue Bonds:					
Senior Debt-1978 Trust Agreement:					
2005, Series A, 5.00%, issued May 5, 2005 due 2016	\$ 4,500	\$ —	\$ 4,500	\$ —	\$ —
2005, Series C, 3.75% to 5.00%, issued May 5, 2005 due 2016	181,590	—	181,590	—	—
2007, Series A, 4.00% to 4.50%, issued May 31, 2007 due 2016 to 2038	44,485	—	1,180	43,305	1,225
2007, Series C, 4.00% to 5.00%, issued May 31, 2007 due 2016 to 2028	26,710	—	1,510	25,200	1,585
2008, Series A Multi-Modal, variable, issued June 19, 2008 due 2016 to 2039	21,925	—	470	21,455	2,591
2008, Series C, 4.60% to 5.00%, issued July 9, 2008 due 2016 to 2021	24,065	—	6,440	17,625	4,775
2010, Series A, 3.00% to 5.00%, issued August 5, 2010 due 2016 to 2041	94,185	—	1,975	92,210	2,050
2010, Series B, 3.00% to 5.00%, issued August 5, 2010 due 2016 to 2041	131,745	—	1,760	129,985	1,810
2010, Series C, 4.00% to 5.00%, issued August 5, 2010 due 2016 to 2019	13,655	—	3,040	10,615	3,275
2010, Series D, Multi-Modal variable, issued August 5, 2010 due 2016 to 2030	89,345	—	5,180	84,165	13,344
2012, Series A, 3.00% to 5.00%, issued July 11, 2012 due 2016 to 2043	112,485	—	8,180	104,305	8,000
2012, Series B, 3.00% to 5.00%, issued July 11, 2012 due 2017 to 2033	158,830	—	—	158,830	—
2014, Series A, 2.00% to 5.00%, issued July 17, 2014 due 2017 to 2045	45,455	—	—	45,455	—
2014, Series B, 4.00% to 5.00%, issued July 17, 2014 due 2017 to 2045	48,230	—	—	48,230	—
2014, Series C, 2.00% to 5.00%, issued July 17, 2014 due 2016 to 2036	156,135	—	5,140	150,995	6,975
2015, Series A, 5.00%, issued July 15, 2015 due 2019 to 2045	—	104,480	—	104,480	—
2015, Series B, 5.00%, issued July 15, 2015 due 2019 to 2045	—	67,005	—	67,005	—
2015, Series C, 2.12% to 2.83%, issued June 30, 2015 due 2026 to 2030	170,730	—	—	170,730	13,765
Subtotal Senior Debt	\$ 1,324,070	\$ 171,485	\$ 220,965	\$ 1,274,590	\$ 59,395

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	<b>Beginning balance</b>	<b>Additions</b>	<b>Reductions</b>	<b>Ending balance</b>	<b>Due within one year</b>
Subordinated debt- 1978 Trust Agreement:					
2000, Series A,B & C, 6.45%, issued December 29, 2000 due 2031	\$ 40,000	\$ —	\$ —	\$ 40,000	\$ —
2001, Series A,B & C, 6.45%, issued January 2, 2001 due 2032	34,000	—	—	34,000	—
Subtotal Subordinate Debt	74,000	—	—	74,000	—
Senior Debt - PFC Trust Agreement:					
2007, Series B, 4.00% to 5.00%, issued May 31, 2007 due 2016 to 2018	\$ 19,670	\$ —	\$ 4,855	\$ 14,815	\$ 5,055
2007, Series D, 5.00%, issued May 31, 2007 due 2016 to 2018	64,530	—	4,110	60,420	17,270
2010, Series E, 5.00%, issued August 5, 2010 due 2016	8,510	—	8,510	—	—
Subtotal PFC Senior Debt	92,710	—	17,475	75,235	22,325
Senior Debt - CFC Trust Agreement:					
2011, Series A, 5.125%, issued June 8, 2011 due 2038 to 2042	\$ 58,030	\$ —	\$ —	\$ 58,030	\$ —
2011, Series B, 3.53% to 6.352%, issued June 8, 2011 due 2016 to 2038	147,010	—	3,360	143,650	3,485
Subtotal CFC Senior Debt	205,040	—	3,360	201,680	3,485
Total Bonds Payable	\$ 1,695,820	\$ 171,485	\$ 241,800	\$ 1,625,505	\$ 85,205
Less unamortized amounts:					
Bond premium (discount), net	89,415	23,420	13,865	98,970	5,197
Total Bonds Payable, net	\$ 1,785,235	\$ 194,905	\$ 255,665	\$ 1,724,475	\$ 90,402

Included in the Authority's bonds payable are \$105.6 million and \$111.3 million of variable rate demand bonds ("VRDB") consisting of Series 2008 A and Series 2010 D as of June 30, 2016 and 2015, respectively. The VRDBs have remarketing features which allow bondholders the right to return, or put, the bonds to the Authority. On August 7, 2013, the Authority entered into a five year irrevocable letter of credit agreement with State Street Bank, in support of the VRDBs. This agreement requires repayment of the tendered, unremarketed VRDBs and any associated obligations on the bonds tendered. Should the VRDBs be tendered and the letter of credit utilized to pay the purchase price of such bonds, the tendered bonds would be converted to bank bonds, possibly requiring one tenth of the tendered bonds to become due within 270 days. The Authority would look to identify an alternative financing arrangement in advance of the bank bonds debt service payment becoming due to satisfy this obligation.

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The VRDBs were issued as multi-modal bonds, thus allowing the Authority to reissue and refund through one of several modes. As a result, the Authority has classified \$10.0 million and \$10.6 million to its current portion of long term debt, in addition to the amounts identified in the schedules of the Authority's bonds payable at June 30<sup>th</sup> due within one year, for the fiscal years ending June 30, 2016 and 2015, respectively.

The following summarizes the Authority's revenue bonds activity at June 30 (in thousands):

	<u>2015 Beginning balance</u>	<u>Additions</u>	<u>Reductions</u>	<u>2016 Ending balance</u>	<u>Due within one year</u>
Senior Debt-1978 Trust Agreement:	\$ 1,324,070	\$ 171,485	\$ 220,965	\$ 1,274,590	\$ 59,395
Subordinated Debt- 1978 Trust Agreement	74,000	—	—	74,000	—
Senior Debt - PFC Trust Agreement:	92,710	—	17,475	75,235	22,325
Senior Debt - CFC Trust Agreement:	205,040	—	3,360	201,680	3,485
	<u>\$ 1,695,820</u>	<u>\$ 171,485</u>	<u>\$ 241,800</u>	<u>\$ 1,625,505</u>	<u>\$ 85,205</u>
	<u>2014 Beginning balance</u>	<u>Additions</u>	<u>Reductions</u>	<u>2015 Ending balance</u>	<u>Due within one year</u>
Senior Debt-1978 Trust Agreement:	\$ 1,120,540	\$ 420,550	\$ 217,020	\$ 1,324,070	\$ 231,580
Subordinated Debt- 1978 Trust Agreement	74,000	—	—	74,000	—
Senior Debt - PFC Trust Agreement:	110,430	—	17,720	92,710	17,475
Senior Debt - CFC Trust Agreement:	208,300	—	3,260	205,040	3,360
	<u>\$ 1,513,270</u>	<u>\$ 420,550</u>	<u>\$ 238,000</u>	<u>\$ 1,695,820</u>	<u>\$ 252,415</u>

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Debt service requirements on revenue bonds (1978 Trust, PFC Trust and CFC Trust) outstanding at June 30, 2016 are as follows (in thousands):

	<b>Principal</b>	<b>Interest</b>	<b>Total</b>
Year ending June 30:			
2016	\$ 75,240	\$ 71,994	\$ 147,234
2017	109,745	69,471	179,216
2018	58,955	65,167	124,122
2019	56,965	63,248	120,213
2020	59,415	61,270	120,685
2021 – 2025	306,080	273,550	579,630
2026 – 2030	341,750	210,143	551,893
2031 – 2035	297,245	122,395	419,640
2036 – 2040	218,440	58,656	277,096
2041 – 2045	101,670	12,521	114,191
Total	\$ 1,625,505	\$ 1,008,415	\$ 2,633,920

#### **a) Senior Debt - 1978 Trust Agreement**

On July 15, 2015, the Authority issued \$171.5 million of Massachusetts Port Authority Revenue Bonds in two series. The Series 2015 A Revenue Bonds were issued in the principal amount of \$104.5 million with an original issue premium of approximately \$15.4 million and an interest rate of 5.0%. The projects financed with Series A bond proceeds include the completion of the parking garage at the Framingham Logan Express site, property acquisition and parking improvements at the Braintree Logan Express and construction of 2,050 additional parking spaces at Logan Airport.

The Series 2015 B Revenue Bonds were issued in the principal amount of \$67.0 million with an original issue premium of approximately \$8.0 million and an interest rate of 5.0%. The projects financed with Series B bond proceeds include construction of a post security corridor between Terminal C and Terminal E, HVAC equipment replacement, HVAC equipment distribution, roof replacements, the creation of new remain overnight parking spaces, and Terminal A airline relocation. Due to the “private activity” nature of the construction projects, these bonds were sold as AMT bonds.

On June 30, 2015, the Authority issued \$170.7 million of Massachusetts Port Authority Revenue Refunding Bonds. The Series 2015 C Revenue Refunding Bonds were issued in the principal amount of \$170.7 million as two fixed rate direct placement bonds of \$131.0 million and \$39.7 million, due to mature in 2025 and 2029, respectively. This competitive bank bid process resulted in a net present value savings of nearly \$27.5 million and the proceeds were used to refund the entire outstanding balance of the 2005 Series C Revenue Bonds on July 1, 2015.

On July 17, 2014, the Authority issued \$249.8 million of Massachusetts Port Authority Revenue Bonds in three series. The Series 2014 A Revenue Bonds were issued in the

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principal amount of \$45.5 million with an original issue premium of approximately \$5.6 million and coupon rates ranging from 2.0% to 5.0%. The projects financed with Series A bond proceeds include a structured garage at the Framingham Logan Express site and roadways that provide access from the terminals to the Airport MBTA Station and the Rental Car Center.

The Series 2014 B Revenue Bonds were issued in the principal amount of \$48.2 million with an original issue premium of approximately \$4.8 million and coupon rates ranging from 4.0% to 5.0%. The projects financed with Series B bond proceeds include electrical substation replacement for Terminals B and E, a post-security corridor between Terminals C and E, and the demolition of an obsolete hangar to create remain overnight aircraft parking spaces.

The Authority also issued the Series 2014 C Revenue Refunding Bonds in the principal amount of \$156.1 million with an original issue premium of approximately \$21.7 million and coupons ranging from 2.0% to 5.0%. The aggregate difference in debt service between the refunded Series 2003 A, 2003 C and 2005 A bonds and the Series 2014 C refunding bonds was \$23.6 million. This refunding had an economic gain and achieved a net present value savings of \$17.1 million or 10.04%. The average annual savings for fiscal year 2015 through fiscal year 2035 was approximately \$1.126 million.

The Authority, through its 1978 Trust Agreement, has covenanted to maintain a debt service coverage ratio of not less than 1.25. Debt service coverage is calculated based on a formula set forth in the 1978 Trust Agreement. Historically, the Authority has maintained a debt service coverage ratio higher than its Trust Agreement requirement to maintain its investment grade bond ratings. As of June 30, 2016 and 2015, the Authority's debt service coverage under the 1978 Trust Agreement was 2.96 and 2.49, respectively.

#### **b) Subordinate Debt - 1978 Trust Agreement**

Subordinate debt is payable solely from funds on deposit in the Improvement and Extension Fund and is not subject to the pledge of the 1978 Trust Agreement, the PFC Trust Agreement or the CFC Trust Agreement. The Authority invested \$12.0 million in January 2001 which at maturity will provide for the \$74.0 million principal payments of the subordinate debt at their respective maturities on December 31, 2030 and January 1, 2031. As of June 30, 2016, the value of the two GICs was approximately \$41.4 million as compared to \$39.7 million as of June 30, 2015.

#### **c) Senior Debt - PFC Trust Agreement**

The Authority's outstanding PFC debt continues to be backed by a pledge of the \$4.50 PFC collections. The Authority earned PFC Revenues, as defined by the PFC Trust Agreement, of approximately \$71.0 million and \$65.9 million during fiscal years 2016 and 2015, respectively. These amounts include approximately \$0.3 and \$0.1 million of investment income on PFC receipts during each of fiscal years 2016 and 2015, respectively.

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The PFC Trust Agreement requires a First Lien Sufficiency covenant ratio in excess of 1.05. As of June 30, 2016 and 2015, the Authority's PFC First Lien Sufficiency covenant ratio under the PFC Trust Agreement was 11.03 and 5.64, respectively.

#### **d) Senior Debt - CFC Trust Agreement**

The Authority's outstanding CFC debt continues to be backed by a pledge of the \$6.00 CFC collections. The Authority earned CFC Revenues, as defined by the CFC Trust Agreement, of approximately \$32.8 million and \$31.2 million during fiscal years 2016 and 2015, respectively. These amounts include approximately \$0.5 and \$0.4 million of investment income on CFC receipts during each of the fiscal years 2016 and 2015, respectively.

The CFC Trust Agreement requires that the Authority maintain a debt service coverage ratio of at least 1.3. As of June 30, 2016 and 2015, the CFC debt service coverage ratio was 2.50 and 2.42, respectively.

#### **e) Special Facility Bonds**

To provide for the construction and improvement of various facilities at Logan Airport, the Authority has issued eight series of special facilities revenue bonds. The Authority's special facilities revenue bonds are all special limited obligations of the Authority, and are payable and secured solely from and by certain revenues of a separate trustee. The Authority's special facilities revenue bonds do not constitute a debt or pledge of the full faith and credit of the Authority, or the Commonwealth of Massachusetts or any subdivision thereof and, accordingly, have not been reflected in the accompanying financial statements. As of June 30, 2016 and 2015, the aggregate principal amount of the Authority's special facilities revenue bonds outstanding was approximately \$550.7 million and \$570.9 million, respectively. The Authority has no obligation for \$133.8 million of Special Facility Bonds and only limited obligation for the remaining \$416.9 million of special facility bonds related to Terminal A described below

Approximately \$416.9 million of the Authority's outstanding special facility bonds as of June 30, 2016 relate to the Delta Airlines Series 2001 A, B, and C bonds issued in connection with Delta Airlines construction of Terminal A. During September 2005, Delta Airlines entered into bankruptcy and as of April 2007 re-emerged out of bankruptcy. The Authority is under no obligation to assume any liability for the Terminal A Special Facility Bonds or to direct revenue, other than an obligation to remit to the trustee of the Terminal A bonds a portion of the Terminal A airline revenue, to service the debt. The Authority and Delta Airlines negotiated a restated and amended lease (the "Amended Lease") for Terminal A pursuant to which Delta Airlines reduced the number of gates that it occupied in Terminal A. The Amended Lease was approved by the bankruptcy court and was effective as of July 1, 2006.

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#### **f) Commercial Notes Payable**

The Authority's commercial notes payable as of June 30, 2016 and 2015 were as follows (in thousands):

	<u>2016</u>	<u>2015</u>
Commercial paper notes	\$ 150,000	\$ 150,000
Commercial paper notes issued	44,000	33,000
Principal paid on commercial paper notes	<u>(69,000)</u>	<u>(33,000)</u>
Commercial paper notes	<u>\$ 125,000</u>	<u>\$ 150,000</u>

In March 2014, the Authority expanded its commercial paper program to \$150 million. Commercial notes payable have been issued under the terms of the 1978 Trust Agreement and are backed by the proceeds of the Improvement and Extension Fund or anticipated bond funds. The allowable maximum principal amount outstanding at any time, in the aggregate principal amount, cannot exceed the lesser of 10% of the Authority's outstanding long-term debt or \$150.0 million, and is backed by a Letter of Credit Agreement with the TD Bank N.A. expiring in June 2017.

The \$100 million of the commercial notes payable have been used to fund PFC eligible projects; therefore the Authority anticipates that PFC revenues will be the source to pay such redemptions. The \$25.0 million of the commercial paper notes payable represent general airline revenue bond anticipation notes. The blended interest rate on Series 2012 A Notes was 0.588% and 0.529% during fiscal years 2016 and 2015, respectively. The blended interest rate on the Series 2012 B Notes was 0.570% and 0.537% during fiscal years 2016 and 2015, respectively. The Authority's commercial notes payable mature in July and August 2016.

During fiscal year 2016 and fiscal year 2015, the Authority did not have any interest rate swaps or other interest rate hedging arrangements.

#### **g) Arbitrage – Rebate Liability**

The United States Treasury has issued regulations on calculating the rebate due to the United States Government on arbitrage liability and determining compliance with the arbitrage rebate provisions of the Tax Reform Act of 1986. Arbitrage liability arises when the Authority temporarily invests the proceeds of tax exempt debt in securities with higher yields. The Authority has no estimated liability on June 30, 2016 and on June 30, 2015 an estimated liability of \$746.9 thousand.

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#### 6. Pension Plan

##### a) *Plan Description*

The Massachusetts Port Authority Employees' Retirement System (the Plan) is a single employer plan established on July 18, 1978, effective January 1, 1979, by enactment of Chapter 487 (an amendment to Chapter 32) of the General Laws of The Commonwealth of Massachusetts to provide retirement benefits for substantially all employees of the Massachusetts Port Authority (the Authority), and incidental benefits for their surviving spouses, beneficiaries and contingent annuitants. Prior to this enactment, Authority employees were members of the Commonwealth of Massachusetts Contributory Retirement System and the funding of the pension liability was on a "pay-as-you-go" method. Pursuant to this enactment, the employees' then present rights and benefits were transferred to the new retirement system. The Plan is a contributory defined benefit plan to which the Authority and its employees contribute such amounts as are necessary to provide assets sufficient to meet benefits to be paid to plan participants. The Plan is administered by the Massachusetts Port Authority Employees' Retirement System Board (the Board).

##### b) *Benefits provided*

Benefits are paid by the Plan from plan assets available for plan benefits. Plan participants are entitled at normal retirement age to benefit payments based upon length of service and earnings levels. Vesting occurs after 10 years of service.

Benefits to participants who retired prior to January 1, 1979 are paid by the Massachusetts State Board of Retirement. The Massachusetts State Board of Retirement is reimbursed for all such benefits paid after December 31, 1978 as these benefits represent obligations of the Plan.

Under Chapter 32, Section 3(8)(c), of the General Laws of The Commonwealth of Massachusetts (Chapter 32), the Plan is reimbursed for benefits paid to participants entitled to receive benefits for previous participation in other Massachusetts Chapter 32 plans. The Plan is also obligated to pay a proportionate share of benefits to participants entitled to receive benefits for subsequent participation in other Massachusetts Chapter 32 plans.

Also under Chapter 32, for members leaving the Authority's employment to work for other Massachusetts governmental units, the Plan transfers their accumulated account balances and creditable service to the retirement system of the new employer. Other such retirement systems are in turn required to make comparable transfers to the Plan for employees coming to work for the Authority.

Optional payment methods may be elected, including the contingent annuitant method which provides for reduced payments during the life of the plan participant and continued payments to the participant's beneficiary after the death of the participant.



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At January 1, 2015 and 2014, the Plan's membership consisted of:

	<b>2015</b>	<b>2014</b>
Retirees and beneficiaries receiving benefits	718	686
Terminated employees entitled to benefits but not yet receiving them	71	61
Current members:		
Active	1,191	1,161
Inactive	74	69
Total membership	2,054	1,977

**c) Contributions required and contributions made**

Contributions are made by the Authority based on amounts required to be funded as determined by annual actuarial valuations and are designed to fund the Plan on a level cost basis, as a percentage of pay, over the average remaining working lifetime of the active participants and to fund operating costs of the Plan. For the years ended June 30, 2016 and 2015, the Authority was required and did contribute to the Plan \$10.8 million and \$11.1 million, respectively. The Authority's annual contribution is made in July of each fiscal year therefore eliminating any deferred outflows related to the timing of contributions. The Authority bears the risk that plan assets might decline due to fluctuations in the market value of the Plan's investments and contributions by the Authority will increase as part of its annual assessment.

Employees who became members prior to January 1, 1975 contribute 5% of their regular compensation through payroll deductions. Employees whose membership commenced on or after January 1, 1975 but prior to January 1, 1984 contribute 7%. Those employees whose membership began on or after January 1, 1984 but prior to July 1, 1996 contribute 8%. Employees hired after July 1, 1996 contribute 9% of their regular compensation. Employees who are hired after December 31, 1978 contribute an additional 2% of regular compensation over \$30,000. These contributions accumulate and, subject to certain restrictions set forth in Chapter 32, are refundable to employees upon termination of employment by the Authority or payable to another retirement system should the employee transfer to another government unit covered by Chapter 32 of the General Laws of The Commonwealth of Massachusetts.

Contributions totaling \$20.8 million (\$10.8 million employer and \$10.0 million employee) and \$20.8 million (\$11.1 million employer and \$9.7 million employee) were recognized by the Plan for plan years 2015 and 2014, respectively.

**d) Investment valuation**

Investments are reported at fair value. Securities traded on a national or international securities exchange are valued at the last reported sales price on the last business day of the plan year; investments traded on a national securities exchange for which no sale was

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reported on that date and investments in common and preferred stocks traded in over-the-counter markets are valued at the mean of the last reported bid and asked prices, or the last reported bid price. Mutual funds and commingled funds, including real estate and alternative investments, are valued based on net asset or unit value at year-end.

**e) Pension plan fiduciary net position**

Detailed information about the Plan's fiduciary net position is available in a separately issued report. The report may be obtained by writing to the Massachusetts Port Authority Employees' Retirement System, One Harborside Drive, Suite 200S, East Boston, MA 02128-2909 or please see the Authority's website, [www.massport.com](http://www.massport.com).

**f) Sensitivity of the net pension liability to changes in the discount rate**

The following presents the net pension liability of the Plan as of December 31, 2015 and 2014, calculated using the discount rate of 7.25% for 2015 and 7.625%, for 2014, as well as what the net pension liability (asset) would be if it were calculated using a discount rate that is one-percentage point lower (6.25% for 2015 and 6.625% for 2014) or one-percentage point higher (8.25% for 2015 and 8.625% for 2014) than the current rate (in thousands):

<u>Fiscal Year</u>	<u>1% decrease (6.250%)</u>	<u>Current discount rate (7.250%)</u>	<u>1% increase (8.250%)</u>
2016	\$ 168,310	\$ 91,915	\$ 31,768

<u>Fiscal Year</u>	<u>1% decrease (6.625%)</u>	<u>Current discount rate (7.625%)</u>	<u>1% increase (8.625%)</u>
2015	\$ 97,711	\$ 28,209	\$ (25,636)

**g) Pension expense and deferred outflows of resources and deferred inflows of resources related to pensions**

For the years ended June 30, 2016 and 2015, the Authority recognized pension expense of \$15.6 million and \$2.2 million, respectively.

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At June 30, 2016 and 2015 the Authority reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources (in thousands):

	<b>2016</b>		<b>2015</b>	
	Deferred Outflows of Resources	Deferred Inflows of Resources	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	\$ 290	\$ —	\$ 1,771	\$ —
Differences arising from the recognition of changes in assumptions	\$ 20,797	\$ —	\$ —	\$ —
Net difference between projected and actual earnings on pension Plan investments	\$ 25,945	\$ —	\$ —	\$ 13,735

Amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows (in thousands):

Year ended June 30:

2017	\$ 7,027
2018	7,027
2019	13,387
2020	12,051
2021	3,387
Thereafter	4,153

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### 7. Other Postemployment Benefits

During the year ended June 30, 2008, the Authority established the Retiree Benefits Trust (the "Trust") and implemented GASB Statement No. 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other Than Pensions*. Statement No. 45 requires governments to account for other postemployment benefits, primarily healthcare, on an accrual basis rather than on a pay-as-you-go basis. The effect is the recognition of an actuarially required contribution as an expense on the statements of revenues, expenses, and changes in net position when future retirees earn their postemployment benefit rather than when they use their postemployment benefit. To the extent that an entity does not fund their actuarially required contribution, a postemployment benefit liability is recognized on the statements of net position over time.

#### a) Plan Description

In addition to providing the pension benefits described in Note 6, the Authority provides post-employment health care and life insurance benefits ("OPEB") for retired employees. The benefit levels, employer contributions and future employee contributions are governed by the Authority and can be amended by the Authority. As of June 30, 2016, approximately 864 retirees and 1,336 active and inactive employees meet the eligibility requirements.

In June 2009, the Board made changes to the plan benefits to be paid by the Authority for certain existing and future retirees. All current retired members of the Authority and all existing Authority employees who were vested as of October 1, 2009 would be eligible to have 100% of their premium cost subsidized. Employees not yet vested but employed by the Authority on October 1, 2009 would, upon retirement be eligible to receive 85% of the premium cost for benefits with the balance paid for by the retiree. For employees hired on or after October 1, 2009, the Board voted to implement a sliding scale subsidy for retiree health care premiums (ranging from 0%-85%) based on creditable service at retirement age (retirees must be age 60 or older to receive the subsidy), and whether or not the employee retired within sixty days after leaving the Authority. The Board also voted to eliminate retiree dental and life insurance coverage, as well as Medicare Part B premium subsidy for this group of employees.

In May 2016, the Board made changes to the plan benefits to be paid by the Authority for certain future retirees. Persons who commenced employment with the Authority during the period from October 1, 2009 through May 25, 2016, and who, as of the date such employment commenced, had accrued ten (10) years or more of creditable service pursuant to M.G.L.c. 32, would upon retirement, be eligible to receive 80% of the premium cost for those benefits with the balance paid for by the retiree; provided, however, that employees who retire with at least thirty (30) years of creditable service would be eligible to receive 85% of the premium cost of such benefits with the balance paid for by the retiree. For purposes of calculating the percentage of the subsidy (80% or 85%), years of creditable service shall be calculated at separation from employment with the Authority. The spouse and dependents of eligible retirees will qualify for the same premium subsidy and retiree health benefits as

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the retiree. Eligible retirees, but not their spouse or dependents, will also qualify for a 100% subsidy from the Authority for retiree basic life insurance.

The OPEB Plan is a single-employer plan and offers retirees a choice of medical plans, as well as two dental plans, and basic life insurance. The medical plans are either HMOs, PPOs or indemnity plans, and some are designed to work with Medicare benefits, such as Medicare supplement or Medicare HMO plans. The basic life insurance provides a \$5,000 death benefit to the retiree. Spouses and dependents are not eligible for this death benefit upon their death. To comply with the requirements of GASB No. 45, the Authority performed an actuarial valuation at January 1, 2015. The Authority issues publicly available audited financial statements for the Trust. The report may be obtained by writing to the Massachusetts Port Authority, Attn: John P. Prankevicius, CPA, Director of Administration and Finance and Secretary-Treasurer, One Harborside Drive, Suite 200S, East Boston, MA 02128-2909. These statements are prepared on the accrual basis of accounting. Employer contributions are recognized when the employer has made formal commitments to provide the contributions and benefits are recorded when due and payable in accordance with the terms of the Trust. Investments are reported at fair value. Mutual funds and commingled funds and alternative investments, are valued based on net asset or unit value at year-end. The Trust did not own any individual securities and no long term contracts for contributions to the Trust existed at June 30, 2016 or 2015.

#### **b) Annual OPEB Costs and Net OPEB Obligation**

The Authority's 2016 and 2015 OPEB expense is calculated based on the ARC, an amount actuarially determined in accordance with the parameters of GASB No. 45. The ARC represents a level of funding that, if paid on an ongoing basis, is projected to cover the normal cost each year and amortize the unfunded actuarial liability over a period of thirty years. The following table shows the components of the Authority's annual OPEB cost for the years ending June 30, 2016, 2015 and 2014, the amount actually contributed to the plan, and the change in the Authority's net OPEB obligation based on an actuarial valuation as of January 1, 2016 (in thousands).

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	<b>2016</b>	<b>2015</b>	<b>2014</b>
Annual Required Contribution (ARC)	\$ 14,390	\$ 13,187	\$ 14,738
Interest on net OPEB obligation	(4,109)	(4,156)	(3,989)
Adjustment to ARC	3,812	3,623	3,391
Annual OPEB cost	14,093	12,654	14,140
Current premiums on a pay-as-you-go basis	—	—	—
Subsidy	1,338	1,905	2,370
Contributions made	12,000	12,000	14,000
Change in net OPEB obligation	(755)	1,251	2,230
Net OPEB Asset – beginning of year	56,669	55,418	53,188
Net OPEB Asset – end of year	\$ 55,914	\$ 56,669	\$ 55,418
% of Annual OPEB cost contributed	85.1%	94.8%	99.0%

#### **c) Funded Status and Funding Progress**

The funded status of the plan, based on an actuarial valuation as of January 1, 2016, was as follows (in thousands):

Actuarially accrued liability (“AAL”)	\$	253,339
Actuarial value of plan assets		149,845
Unfunded actuarial accrued liability (“UAAL”)	\$	103,494
Funded ratio (actuarial value of plan assets/AAL)		59.1%
Covered payroll (active plan members)	\$	116,263
UAAL as a percentage of covered payroll		89.0%

Actuarial valuations of an ongoing plan involve estimates of the value of reported amounts and assumptions about the probability of occurrence of events far into the future. Examples include assumptions about future employment, mortality, and the healthcare cost trend. Amounts determined regarding the funded status of the plan and the annual required contributions of the Authority are subject to continual revision as actual results are compared with past expectations and new estimates are made about the future. The schedule of funding progress, presented as required supplementary information following the notes to the financial statements, presents multi-year trend information that shows whether the actuarial value of plan assets is increasing or decreasing over time relative to the actuarial accrued liabilities for benefits.

#### **d) Actuarial Methods and Assumptions**

Projections of benefits for financial reporting purposes are based on the plan as understood by the Authority and the plan members and include the types of benefits provided at the

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time of each valuation and the historical pattern of sharing of benefit costs between the Authority and Plan members. The actuarial methods and assumptions used include techniques that are designed to reduce short-term volatility in actuarial accrued liabilities and the actuarial value of assets, consistent with the long-term perspective of the calculations. The actuarial value of assets on January 1, 2016 was \$149.8 million and the actuarial assumptions included a 7.25% investment rate of return (reduced from 7.5% for the January 1, 2016 valuation) and an initial annual health care cost trend rate range of -2.4% to 9.0% which decreases to a long-term trend rate between 5.0% and 6.0% for all health care benefits after ten years. The initial annual dental cost trend rates range from 5.0% to 12.4% which decrease to a long term trend rate between 5.0% and 5.3% for all dental benefits after ten years. The inflation rate is 3.00% per year.

#### 8. Leases

##### a) *Commitments*

The Authority has commitments under various operating leases, which contain escalation clauses, as lessee. The following is a schedule by years of minimum rental payments under noncancelable operating leases as of June 30, 2016 (in thousands):

Years	Amount	Years	Amount
2017	\$ 29,482	2037 – 2041	\$ 4,880
2018	17,273	2042 – 2046	4,880
2019	10,769	2047 – 2051	4,880
2020	5,708	2052 – 2056	4,880
2021	2,420	2057 – 2061	4,880
2022 – 2026	5,120	2062 – 2066	4,880
2027 – 2031	4,880	2067 – 2070	3,552
2032 – 2036	4,880	Total	\$ 113,364

Rent expense and other operating lease related payments were \$29.6 million and \$30.0 million for fiscal years 2016 and 2015, respectively.

##### b) *Rental Income*

The Authority leases a major portion of its Aviation and Port properties to various tenants. Many of these operating leases provide for periodic adjustments to rental rates, including certain provisions for contingent payments based on specified percentages of the tenant's gross revenue.

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The following is a schedule by years of minimum future rental income on noncancelable operating leases as of June 30, 2016 (in thousands):

Years	Amount	Years	Amount
2017	\$ 97,054	2052 – 2056	\$ 48,905
2018	79,423	2057 – 2061	50,050
2019	76,599	2062 – 2066	51,311
2020	71,658	2067 – 2071	52,624
2021	70,090	2072 – 2076	54,060
2022 – 2026	284,520	2077 – 2081	55,559
2027 – 2031	166,587	2082 – 2086	50,344
2032 – 2036	94,184	2087 – 2091	42,886
2037 – 2041	90,047	2092 – 2096	43,662
2042 – 2046	85,681	2097 – 2101	14,357
2047 – 2051	62,007	2102 – 2106	1,764
		2107 – 2108	353
		Total	\$ 1,643,725

Rental income and concession income, including contingent payments received under these provisions, were approximately \$309.7 million and \$290.3 million for the fiscal years 2016 and 2015, respectively.

### 9. Risk Management

The Authority, as mandated by the 1978 Trust Agreement, maintains a self insurance account for general liability and workers compensation within the Operating Fund. The self insurance accruals are determined based on insurance claim history and actuarial estimates needed to pay prior and current-year claims. The accrued liability was approximately \$8.0 million and \$7.6 million as of June 30, 2016 and 2015, respectively, and is included as a component of accrued expenses in the accompanying financial statements. This liability is fully funded as of June 30, 2016 and 2015.

Changes in the accrued liability accounts, related to self insurance, in fiscal year 2016, 2015 and 2014 were as follows (in thousands):

	2016	2015	2014
Liability balance, beginning of year	\$ 7,625	\$ 8,015	\$ 7,253
Provision to record estimated losses	2,706	2,955	3,552
Payments	(2,345)	(3,345)	(2,790)
Liability balance, end of year	\$ 7,986	\$ 7,625	\$ 8,015

As part of its normal operations, the Authority encounters the risk of accidental losses stemming from third party liability claims, property loss or damage, and job related injuries



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and illnesses. In managing these loss exposures, a combination of risk management measures is applied, including safety and loss prevention programs, emergency planning, contractual risk transfer, self insurance, and insurance.

In connection with the self insurance and insurance programs, the Authority retains part of the losses incurred and internally manages the self insured claims. The self insured retention currently includes: \$1.0 million for worker's compensation per job related accident for Massport employees and International Longshoreman's Association Members; \$1,000 per occurrence for automobile liability; aviation general liability and airport terrorism insurance; \$0.25 million for airside incidents and for non-airside auto losses; \$25 thousand for Comprehensive Marine Liability, Terminal Operator's Liability, Stevedore's liability; and \$0.25 million for property losses per occurrence. Insurance is purchased above the self-insured amounts, subject to availability and the reasonableness of cost. Liabilities for self insured claims are reported if it is probable that a loss has been incurred and the amount can be reasonably estimated. These losses include an estimate of claims that have been incurred but not reported at year-end and are based on the historical cost of settling similar claims. The Authority records such liabilities as accrued expenses. The Authority from time to time is engaged in various matters of routine litigation. These matters include personal injury and property damage claims for which the Authority's liability is covered in whole or in part by insurance. The Authority does not expect that these matters will require any amounts to be paid which in the aggregate would materially affect the financial statements.

Settled claims resulting from the risks discussed above have not exceeded the amount of insurance coverage in force in any of the past three fiscal years. Further, insurance maintained in fiscal years 2016 and 2015 has not changed significantly from prior periods.

#### **10. Payments in Lieu of Taxes**

The Authority's Enabling Act, the 1978 Trust Agreement and the PILOT Agreements authorize and directs the Authority, subject to certain standards and limitations, to enter into agreements (collectively, the "PILOT Agreements") to make annual payments in lieu of taxes to the City of Boston and the Town of Winthrop.

The PILOT Agreements provide that annual payments may not exceed the balance of revenues remaining after deposits to pay operating expenses, required deposits to the Interest and Sinking Fund and required deposits to the Maintenance Reserve Fund.

Pursuant to the terms of the amended Boston PILOT Agreement (the "Amended Boston PILOT Agreement"), the term of the Amended Boston PILOT Agreement terminates on June 30, 2022 subject to (1) mutual rights annually to terminate the Amended Boston PILOT Agreement and (2) automatic one year extensions of the term each July 1. The Amended Boston PILOT Agreement provides for the Authority to pay (i) an annual base amount (the "Base Amount") of \$14.0 million, which, commencing in fiscal year 2007, increases annually by the annual percentage change in the consumer price index, provided that such increase shall be no less than 2% nor greater than 8% per year, (ii) for ten years,

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an amount of \$700,000, which shall not be increased or adjusted, and (iii) a community portion (the "Community Portion").

In fiscal year 2006, the Authority and the Town of Winthrop entered into an Amended and Restated Payment-In-Lieu-Of-Taxes Agreement (the "Amended Winthrop PILOT Agreement"), which extended the base in-lieu-of-tax payments through fiscal year 2025. The Amended Winthrop PILOT Agreement provides for the Authority to make an annual payment of \$900,000, which will be adjusted in fiscal years 2016 through 2025 if the average annual percentage change in the consumer price index in fiscal year 2006 through 2015 is less than 2% or more than 8%.

PILOT expenses to the City of Boston for fiscal years 2016 and 2015 were \$18.5 million and \$18.4 million, respectively. PILOT expenses to the Town of Winthrop for fiscal years 2016 and 2015 were \$0.9 million for each year.

### 11. Commitments

#### a) *Contractual Obligations for Construction*

The Authority enters into construction contracts with various construction and engineering companies. Construction contracts outstanding were approximately \$249.5 million and \$363.8 million as of June 30, 2016 and 2015, respectively.

#### b) *Seaport Bond Bill*

The Seaport Bond Bill was enacted in 1996 and among other things, provides for funding improvements to the Massachusetts rail transportation network allowing rail shipment of double stack cargo from Allston Yards in Boston to points west, which is anticipated to encourage expanded container shipments through the Port of Boston. The Seaport Bond Bill requires that the Authority provides up to fifty percent (50%) of the cost of improvements to the rail line from Framingham to the Allston Yard in Boston permitting double stack shipments. Expenditure of funds will not occur until the execution of a Master Agreement, as defined by the statute, between the Commonwealth and the participating railroads. The Authority believes that the likelihood that any such Master Agreement will be executed and Authority funds committed for double stack improvements within the next fiscal year is remote.

### 12. Litigation

#### a) *Events of September 11, 2001*

The Authority has been engaged in routine litigation as well as litigation involving the terrorist attacks of September 11, 2001.

On September 11, 2001, terrorists hijacked American Airlines flight 11 and United Airlines flight 175 and flew them into the World Trade Center in New York, N.Y. The terrorist acts caused the deaths of approximately 3,000 persons, unknown numbers of personal injuries, and massive property damage. Both flights originated at Logan Airport.

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In September 2001, Congress passed the Air Transportation Safety and System Stabilization Act of 2001 (“ATSSSA”), which provides, among other things, a limitation on liability of various entities, including airport sponsors such as the Authority, for the events of 9/11. Specifically, the liability of an airport sponsor for those events “shall not be in an amount greater than the limits of liability insurance coverage maintained by that . . . airport sponsor”. The Authority has insurance in effect to cover these incidents in the amount of \$500.0 million per occurrence and consequently, under ATSA the Authority’s liability, if any, would be limited to such amounts. To the Authority’s knowledge, the Authority’s insurer has received copies of all complaints and Notices of Claim and/or any other form of notification to the Authority by an individual or entity claiming to have suffered a loss.

Furthermore, to the Authority’s knowledge, its insurer has agreed to defend any such claims and has not reserved its rights to deny coverage with respect to any of those claims although the insurer has reserved its rights with respect to (i) the number of occurrences, (ii) indemnification of the Authority against any award of punitive damages, and (iii) the Authority’s rights as a named additional insured under other policies of insurance, including policies of the Authority’s tenants and licensees.

On July 18, 2013, the Authority was dismissed from the remaining property damage lawsuits, both brought by the World Trade Center Properties, LLC, (“WTCP”). WTCP has appealed this ruling. All other wrongful death and property damage lawsuits against the Authority and other defendants have been settled or dismissed. These settlements have been achieved without any financial contribution from the Authority or its insurer. WTCP appealed this ruling to the United States Court of Appeals for the Second Circuit, and on September 17, 2015, the Second Circuit vacated the judgment in part and remanded the case to the District Court to recalculate the loss in value of WTCP leasehold interest. On December 1, 2015, the Second Circuit denied WTCP’s petition requesting an en banc hearing, asking for reconsideration of the issues reviewed by the Second Circuit as described above.

#### ***b) Other Litigation***

On July 2, 2014, the Authority was served with a lawsuit in which the Authority is the named defendant. The lawsuit arises out of the Authority’s taking by eminent domain on January 6, 2014 of the property commonly referred to as the Logan Express parking and shuttle facility in Braintree, MA (the “Property”) for which the Authority paid what it determined was just compensation. The lawsuit claims that the Authority failed to award just compensation to the former owner Tara Investment Holdings LLC f/k/a The Flatley 06 LLC for the Property.

On May 27, 2016, May 18, 2016, March 16, 2016, and March 16, 2014, the Authority and several other co-defendants were named in complaints arising out of an incident on May 31, 2014, which involved seven fatalities when an aircraft attempted, but failed, to take flight from Hanscom Field. The Authority does not believe that the outcome will materially affect the Authority’s operations or financial condition.

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The Authority also is engaged in numerous matters of routine litigation. These matters include personal injury and property damage claims for which the Authority's liability is covered in whole or in part by insurance. Others include such matters as disputes with contractors, subcontractors, engineers and others arising out of construction and maintenance of the Authority's properties; disputes over leases and concessions; property, theft and damage claims arising from the Authority's operations, employment matters and workers compensation, as to which the Authority is self-insured. The Authority does not expect that these matters will require any amounts to be paid which, in the aggregate, will be material to the results of operations.

#### **c) *Pollution Remediation Obligation***

The Authority is currently involved in six separate pollution remediation obligations that meet the requirements for accounting treatment under GASB Statement No. 49, *Accounting and Financial Reporting for Pollution Remediation Obligations* ("GASB No. 49"). These obligations are generally related to the removal and/or treatment of contaminated soil, groundwater and petroleum products associated with fuel storage and conveyance. GASB No. 49 dictates that for each obligating event, an estimate of the expected pollution remediation outlays is required to be accrued as a liability and expensed in the current period. Re-measurement of the liability is required when new information indicates increases or decreases in estimated outlays. In 2017, the Authority will begin demolition of a hanger at Hanscom Field and will incur pollution remediation costs. The total of these expenses cannot be estimated at June 30, 2016.

The estimated liability as of June 30, 2016 and 2015 is \$0.6 million and \$2.6 million, respectively, which represents the approximate amounts the Authority expects to pay for future remediation activities. The Authority paid approximately \$2.0 million and \$4.7 million in fiscal years 2016 and 2015, respectively. This estimate was generated using input and guidance from internal management and professional consultants, and represents a wide array of remediation activities ranging from onetime events to longer-term sustained monitoring activity. The Authority will continue to closely monitor each of these obligations, working toward regulatory closure, and will make any necessary adjustments to the potential liability as new information becomes available.

### **13. Interagency Agreements**

#### **a) *Investment in Joint Venture***

In May 1996, the Authority entered into an interagency agreement with the Massachusetts Highway Department ("MHD") and Massachusetts Bay Transportation Authority ("MBTA") for the construction of a Regional Transportation Center ("RTC") in Woburn, Massachusetts ("Interagency Agreement"). Under the terms of the Interagency Agreement, the Authority has paid one third of the costs of acquiring the site and constructing the RTC, and will share in a like proportion in the profits and losses of the RTC. During fiscal years 2016 and 2015, the Authority recognized income of approximately \$0.2 and \$0.1 million in each year, respectively, representing its share of the earnings of the RTC.

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#### **b) Logan Airport Silver Line Transportation Agreement**

In December 2005, the Authority entered into a ten year agreement with the MBTA to provide public transportation between South Station in Boston, Massachusetts and Logan Airport along a route called the Silver Line. Pursuant to this agreement, the Authority purchased eight buses at a cost of \$13.3 million and the MBTA agreed to operate and maintain the Authority's Silver Line buses for a cost of \$2.0 million per year, paid in equal monthly installments. In August 2015, this agreement was extended for an additional five year period and modified to provide that the Authority would be responsible for paying the FAA approved rate of 76.06% of the costs to operate and maintain the Silver Line buses and the Authority will be responsible for 76.06% of the future rebuild of the Silver Line buses.

#### **14. Subsequent Events**

##### **a) Bond issue**

On July 20, 2016, the Authority issued \$230.3 million of Massachusetts Port Authority Revenue Bonds in two series. The Series 2016 A Revenue Refunding Bonds were issued in the principal amount of \$50.0 million with an original issue premium of approximately \$12.6 million and interest rates ranging from 3.0% to 5.0%. The 2016 A Bonds were issued to refund a portion of the currently outstanding Revenue Bonds, Series 2007 A Bonds on an advance basis and all of the currently outstanding variable rate demand revenue bonds, Series 2008 A.

The Series 2016 B Revenue Bonds were issued in the principal amount of \$180.3 million with an original issue premium of approximately \$26.8 million and interest rates ranging from 4.0% to 5.0%. The 2016 B Bonds were issued to finance a portion of the Authority's FY16-FY20 Capital Program. A portion of the Authority's FY16-FY20 Capital Program has been financed to date with proceeds of the Authority's Tax Exempt Commercial Paper notes, Series 2012 B currently outstanding in the amount of \$113.0 million. The Authority expects to use a portion of the proceeds of the 2016 B Bonds to repay and redeem \$25.0 million of the currently outstanding Notes on or shortly after the date of issuance of the 2016 Bonds. Due to the "private activity" nature of the construction projects, these bonds were sold as AMT bonds.

##### **b) Other Litigation**

In September 2016, on the first day of trial, the Authority and the former owner, Tara Investment Holdings LLC f/k/a The Flatley 06 LLC settled the litigation related to the Authority's taking by eminent domain on January 6, 2014 of the property commonly referred to as the Logan Express parking and shuttle facility in Braintree, MA.

**MASSACHUSETTS PORT AUTHORITY**

Required Supplementary Information

Schedule of OPEB Funding Progress

June 30, 2016

(In thousands)

**Schedule of OPEB Funding Progress**

(1) Actuarial valuation date	(2) Actuarial value of plan assets	(3) Actuarial accrued liability (AAL)	(4) (Overfunded) unfunded (UAAL) AAL(2) – (3)	(5) Actuarial value of assets as a percentage of AAL (funded ratio) (2)/(3)	(6) Annual covered payroll	(7) (UAAL) AAL as a percentage of covered payroll (4)/(6)
1/1/2016	\$ 149,845	253,339	103,494	59.1%	\$ 116,263	89.0%
1/1/2015	148,501	237,133	88,632	62.6	108,508	81.7
1/1/2013	105,622	224,488	118,866	47.1	95,400	124.6
1/1/2011	76,693	237,462	160,768	32.3	95,400	168.6
6/30/2009	48,931	219,619	170,688	22.3	95,749	178.3
7/01/2006	-	167,521	167,521	-	87,630	191.2

Analysis of the dollar amounts of net assets available for benefits, Actuarial Accrued Liability (AAL), and assets in excess of AAL in isolation can be misleading. Expressing the Actuarial Value of Assets available for benefits as a percentage of the AAL provides one indication of the Plan's funding status on a going-concern basis. Analysis of this percentage over time indicates whether the Plan is AAL and annual covered payroll are both affected by inflation. Expressing the AAL in excess of assets as a percentage of annual covered payroll approximately adjusts for the effects of inflation and aids analysis of progress made in accumulating sufficient assets to pay benefits when due. Generally, the lower this percentage, the stronger the Plan.

The comparability of trend information is affected by changes in actuarial assumptions, benefit provisions, actuarial funding methods, accounting policies, the size or composition of the population covered by the Plan, and other changes. Those changes usually affect trends in contribution requirements and in ratios that use the AAL as a factor.

**MASSACHUSETTS PORT AUTHORITY**

Required Supplementary Information

Schedule of Pension Contributions

June 30, 2016

(In thousands)

	<u>2016</u>	<u>2015</u>	<u>2014</u>	<u>2013</u>	<u>2012</u>	<u>2011</u>	<u>2010</u>	<u>2009</u>	<u>2008</u>	<u>2007</u>
Actuarially determined contribution	\$ 10,845	\$ 11,146	\$ 11,960	\$ 9,594	\$ 5,710	\$ 4,924	\$ 7,621	\$ 401	\$ 1,006	\$ 3,149
Actual contribution in relation to the actuarially determined contribution	<u>10,845</u>	<u>11,146</u>	<u>11,960</u>	<u>9,594</u>	<u>5,710</u>	<u>4,924</u>	<u>7,621</u>	<u>401</u>	<u>1,006</u>	<u>3,149</u>
Contribution deficiency (excess)	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>	\$ <u>-</u>
Covered employee payroll	\$ 99,190	\$ 94,340	\$ 90,042	\$ 87,476	\$ 85,941	\$ 89,950	\$ 89,704	\$ 85,120	\$ 79,075	\$ 76,305
Contributions as a percentage of covered employee payroll	10.9%	11.8%	13.3%	11.0%	6.6%	5.5%	8.5%	0.5%	1.3%	4.1%

**Notes to Schedule**

**Valuation date:**

Actuarially determined contribution rates are calculated annually as of January 1, 18 months prior to the end of the fiscal year in which the contributions are reported. Contributions are made on July 1, of each year.

**Methods and assumptions used to determine contribution rates:**

Actuarial cost method	Frozen entry age
Amortization method	20 Level dollar, closed
Remaining amortization period	Multiple bases with remaining periods from 8 to 20 year:
Asset valuation method	Beginning in 2008, market value of assets using a five year smoothing period. Prior to 2008, used four year asset smoothing period.
Inflation rate	3.0%
Salary increases	2013 valuation: 4.5%; 2009 valuation: 4.75; prior to 2009: 5.00%
Investment rate of return	2015 valuation: 7.5%; 2012 valuation: 7.625%; 2010 valuation: 7.5%; 2009 valuation: 8.0%; prior to 2009: 7.75%
Retirement age	In the 2013 valuation, additional retirement assumptions were added for employees hired after April 1, 2012 and subject to pension reform and the assumption was changed due to an experience study. In the 2008 valuation the retirement assumption was extended to age 70 for Group 1 employees.
Disability and withdrawal mortality	Changed in the 2013 valuation due to an experience study. In the 2013 valuation, mortality was changed to RP2000 projected generationally with scale BE In the 2012 valuation, mortality was changed to RP2000 projected 22 years using scale AA. In the 2009, 2010 and 2011 valuations mortality was changed to RP2000 projected nine, ten and eleven years, respectively, using scale AA.

**Other information**

As of January 1, 2013, the mortality assumption was changed to the RP2000 Generational Table and the retirement, disability and withdrawal assumptions were changed based on an experience study.

As of January 1, 2012, the mortality assumption was changed to the RP2000 Table projected forward 22 years with Scale AA, interest rate changed to 7.625% (from 7.75%) and salary rate to 4.50% (from 4.75%). Vacation buyback factor was increased from 1.00% to 1.25%.

As of January 1, 2011, the mortality assumption was changed to the RP2000 Table projected forward 11 years with Scale AA.

As of January 1, 2010, the mortality assumption was changed to the RP2000 Table projected forward 10 years with Scale AA, interest rate was changed to 7.75% (from 8.00%).

As of January 1, 2009, the mortality assumption was changed to the RP2000 Table projected forward 9 years with Scale AA, interest rate was changed to 8.00% (from 7.75%), salary rate was changed to 4.75% (from 5.00%), contribution timing was changed to the beginning of the fiscal year from monthly.

As of January 1, 2008, the retirement age assumption was extended to age 70 for Group 1 employees, disabled mortality changed to a 2 year set forward and the asset valuation method was changed to a 5 year smoothing.

As of January 1, 2006, the calculation of the 3(8)C liabilities did not reflect further COLA increases

**MASSACHUSETTS PORT AUTHORITY**

Required Supplementary Information

Schedule of Changes in the Net Pension Liability and Related Ratios

June 30, 2016

(In thousands)

	<u>2016</u>	<u>2015</u>	<u>2014</u>
<b>TOTAL PENSION LIABILITY</b>			
Service cost	\$ 14,875	\$ 13,056	\$ 12,516
Interest	41,160	40,956	38,660
Change of benefit terms	-	-	-
Differences between expected and actual experience	(1,395)	1,929	-
Change of assumptions	24,098	-	-
Benefit payments , including refunds of employee contributions	(26,106)	(24,357)	(22,708)
<b>Net change in total pension liability</b>	<u>52,632</u>	<u>31,584</u>	<u>28,468</u>
<b>Total pension liability - beginning</b>	<u>565,905</u>	<u>534,321</u>	<u>505,853</u>
<b>Total pension liability - ending</b>	<u>\$ 618,537</u>	<u>\$ 565,905</u>	<u>\$ 534,321</u>
<b>PLAN FIDUCIARY NET POSITION</b>			
Contributions - employer	\$ 10,845	\$ 11,146	\$ 11,960
Contributions - employee	9,948	9,628	9,112
Net Investment Income	(4,572)	32,062	65,818
Benefit payments , including refunds of employee contributions	(26,106)	(24,357)	(22,707)
Administrative expense	(1,189)	(1,417)	(957)
<b>Net change in plan fiduciary net position</b>	<u>(11,074)</u>	<u>27,062</u>	<u>63,226</u>
<b>Plan fiduciary net position - beginning</b>	<u>537,696</u>	<u>510,634</u>	<u>447,408</u>
<b>Plan fiduciary net position - end</b>	<u>\$ 526,622</u>	<u>\$ 537,696</u>	<u>\$ 510,634</u>
<b>Massport net pension liability - ending</b>	\$ 91,915	\$ 28,209	\$ 23,687
<b>Plan fiduciary net position as a percentage of the total pension liability</b>	85.1%	95.0%	95.6%
<b>Covered-employee payroll</b>	99,190	94,340	90,042
<b>Massport's net pension liability as a percentage of covered employee payroll</b>	92.7%	29.9%	26.3%



## MASSACHUSETTS PORT AUTHORITY

## Combining Schedule of Net Position

June 30, 2016

(In thousands)

	Authority Operations	PFC Program	CFC Program	Combined Totals
Current assets:				
Cash and cash equivalents	\$ 63,497	\$ —	\$ —	\$ 63,497
Investments	82,062	—	—	82,062
Restricted cash and cash equivalents	125,327	43,375	18,264	186,966
Restricted investments	180,310	24,737	4,959	210,006
Accounts receivable				
Trade, net	49,512	7,492	3,285	60,289
Grants	21,874	—	—	21,874
Total receivables, net	71,386	7,492	3,285	82,163
Prepaid expenses and other assets	7,469	98	57	7,624
Interfund transfer Authority Loan	—	—	—	—
Total current assets	530,051	75,702	26,565	632,318
Noncurrent assets:				
Investments	138,482	—	—	138,482
Restricted investments	251,034	9,415	32,871	293,320
Prepaid expenses and other assets, long-term	5,213	—	1,144	6,357
Investment in joint venture	2,595	—	—	2,595
Net OPEB asset	55,914	—	—	55,914
Capital assets-not being depreciated	452,409	—	18	452,427
Capital assets-being depreciated-net	1,956,633	398,848	278,989	2,634,470
Total noncurrent assets	2,862,280	408,263	313,022	3,583,565
Total assets	3,392,331	483,965	339,587	4,215,883
Deferred outflows of resources				
Deferred loss on refunding of bonds	17,554	314	—	17,868
Deferred loss on expected vs actual Plan experience	290	—	—	290
Deferred loss on Pension Plan Change of Assumptions	20,797	—	—	20,797
Deferred loss on Pension Plan Investments	25,945	—	—	25,945
Total deferred outflows of resources	64,586	314	—	64,900
Current liabilities:				
Accounts payable and accrued expenses	149,040	—	49	149,089
Compensated absences	1,416	—	—	1,416
Contract retainage	10,843	—	—	10,843
Current portion of long-term debt	64,079	22,889	3,434	90,402
Commercial notes payable	125,000	—	—	125,000
Interfund transfer Authority Loan	—	—	—	—
Accrued interest payable	28,435	1,866	5,792	36,093
Unearned revenues	9,423	—	—	9,423
Total current liabilities	388,236	24,755	9,275	422,266
Noncurrent liabilities				
Accrued expenses	9,203	—	553	9,756
Compensated absences	18,119	—	—	18,119
Net pension liability	91,915	—	—	91,915
Contract retainage	3,483	—	—	3,483
Long-term debt, net	1,384,182	52,910	196,981	1,634,073
Unearned revenues	9,141	—	—	9,141
Total noncurrent liabilities	1,516,043	52,910	197,534	1,766,487
Total liabilities	1,904,279	77,665	206,809	2,188,753
Deferred inflows of resources				
Deferred gain on refunding of bonds	8,088	—	—	8,088
Deferred gain on Pension Plan Investments	—	—	—	—
Total deferred inflows of resources	8,088	—	—	8,088
Net investment in capital assets				
884,833	884,833	323,362	102,727	1,310,922
Restricted for other purposes				
Bond funds	202,619	—	—	202,619
Project funds	186,303	—	—	186,303
Passenger facility charges	—	83,252	—	83,252
Customer facility charges	—	—	30,051	30,051
Other purposes	27,391	—	—	27,391
Total restricted	416,313	83,252	30,051	529,616
Unrestricted				
243,404	243,404	—	—	243,404
Total net position				
\$ 1,544,550	\$ 1,544,550	\$ 406,614	\$ 132,778	\$ 2,083,942

See accompanying independent auditors' report.

## MASSACHUSETTS PORT AUTHORITY

Combining Schedule of Revenues, Expenses, and Changes in Net Position

Year ended June 30, 2016

(In thousands)

	Authority Operations	PFC Program	CFC Program	Combined Totals
Operating revenues:				
Aviation rentals	\$ 198,103	\$ —	\$ —	\$ 198,103
Aviation parking	154,568	—	—	154,568
Aviation shuttle bus	18,009	—	—	18,009
Aviation fees	139,425	—	—	139,425
Aviation concessions	87,401	—	—	87,401
Aviation operating grants and other	2,781	—	—	2,781
Maritime fees, rentals and other	74,654	—	—	74,654
Real estate fees, rents and other	24,537	—	—	24,537
Total operating revenues	<u>699,478</u>	<u>—</u>	<u>—</u>	<u>699,478</u>
Operating expenses:				
Aviation operations and maintenance	261,115	—	—	261,115
Maritime operations and maintenance	53,359	—	—	53,359
Real estate operations and maintenance	11,887	—	—	11,887
General and administrative	58,232	—	—	58,232
Payments in lieu of taxes	19,375	—	—	19,375
Pension and other post-employment benefits	29,654	—	—	29,654
Other	7,595	—	—	7,595
Total operating expenses before depreciation and amortization	<u>441,217</u>	<u>—</u>	<u>—</u>	<u>441,217</u>
Depreciation and amortization	188,713	44,688	14,101	247,502
Total operating expenses	<u>629,930</u>	<u>44,688</u>	<u>14,101</u>	<u>688,719</u>
Operating income (loss)	<u>69,548</u>	<u>(44,688)</u>	<u>(14,101)</u>	<u>10,759</u>
Nonoperating revenues and (expenses):				
Passenger facility charges	—	70,718	—	70,718
Customer facility charges	—	—	32,335	32,335
Investment income	8,010	965	478	9,453
Net (decrease)/increase in the fair value of investments	1,862	54	200	2,116
Other revenues	—	—	49	49
Settlement of claims	70	—	—	70
Terminal A debt service contribution	—	(11,903)	—	(11,903)
Other expenses	199	—	(315)	(116)
Loss on sale of equipment	(595)	—	—	(595)
Interest expense	(47,827)	(4,129)	(11,657)	(63,613)
Total nonoperating (expense) revenue, net	<u>(38,281)</u>	<u>55,705</u>	<u>21,090</u>	<u>38,514</u>
Increase in net position before capital contributions	31,267	11,017	6,989	49,273
Capital contributions	56,033	—	—	56,033
Increase in net position	87,300	11,017	6,989	105,306
Net position, beginning of year	1,457,250	395,597	125,789	1,978,636
Net position, end of year	<u>\$ 1,544,550</u>	<u>\$ 406,614</u>	<u>\$ 132,778</u>	<u>\$ 2,083,942</u>

See accompanying independent auditors' report.

## MASSACHUSETTS PORT AUTHORITY

Combining Schedule of Net Position

June 30, 2015

(In thousands)

	Authority Operations	PFC Program	CFC Program	Eliminations	Combined Totals
<b>Current assets:</b>					
Cash and cash equivalents	\$ 54,568	\$ —	\$ —	\$ —	\$ 54,568
Investments	80,224	—	—	—	80,224
Restricted cash and cash equivalents	293,464	47,185	17,965	—	358,614
Restricted investments	159,190	12,336	5,831	—	177,357
Accounts receivable					
Trade, net	47,672	6,978	3,271	—	57,921
Grants	55,807	—	—	—	55,807
Total receivables, net	103,479	6,978	3,271	—	113,728
Prepaid expenses and other assets	9,597	107	57	—	9,761
Interfund transfer Authority Loan	6,000	—	—	(6,000)	—
Total current assets	706,522	66,606	27,124	(6,000)	794,252
<b>Noncurrent assets:</b>					
Investments	73,475	—	—	—	73,475
Restricted investments	229,503	4,340	22,182	—	256,025
Prepaid expenses and other assets, long-term	5,021	98	1,201	—	6,320
Investment in joint venture	2,395	—	—	—	2,395
Net OPEB asset	56,669	—	—	—	56,669
Capital assets-not being depreciated	421,093	7,585	455	—	429,133
Capital assets-being depreciated-net	1,825,708	413,252	292,264	—	2,531,224
Total noncurrent assets	2,613,864	425,275	316,102	—	3,355,241
Total assets	3,320,386	491,881	343,226	(6,000)	4,149,493
<b>Deferred outflows of resources</b>					
Deferred loss on refunding of bonds	17,186	635	—	—	17,821
Deferred loss on expected vs actual Plan experience	1,771	—	—	—	1,771
Total deferred outflows of resources	18,957	635	—	—	19,592
<b>Current liabilities:</b>					
Accounts payable and accrued expenses	116,982	747	77	—	117,806
Compensated absences	1,415	—	—	—	1,415
Contract retainage	9,657	—	508	—	10,165
Current portion of long-term debt	236,220	18,091	3,310	—	257,621
Commercial notes payable	150,000	—	—	—	150,000
Interfund transfer Authority Loan	—	—	6,000	(6,000)	—
Accrued interest payable	27,428	2,281	5,846	—	35,555
Unearned revenues	9,338	—	679	—	10,017
Total current liabilities	551,040	21,119	16,420	(6,000)	582,579
<b>Noncurrent liabilities</b>					
Accrued expenses	9,640	—	602	—	10,242
Compensated absences	18,105	—	—	—	18,105
Net pension liability	28,209	—	—	—	28,209
Long-term debt, net	1,251,399	75,800	200,415	—	1,527,614
Unearned revenues	9,965	—	—	—	9,965
Total noncurrent liabilities	1,317,318	75,800	201,017	—	1,594,135
Total liabilities	1,868,358	96,919	217,437	(6,000)	2,176,714
<b>Deferred inflows of resources</b>					
Deferred gain on Plan investments	13,735	—	—	—	13,735
Total deferred inflows of resources	13,735	—	—	—	13,735
<b>Net investment in capital assets</b>	830,910	327,581	113,780	—	1,272,271
<b>Restricted for other purposes</b>					
Bond funds	193,825	—	—	—	193,825
Project funds	219,221	—	—	—	219,221
Passenger facility charges	—	68,016	—	—	68,016
Customer facility charges	—	—	12,009	—	12,009
Other purposes	23,835	—	—	—	23,835
Total restricted	436,881	68,016	12,009	—	516,906
<b>Unrestricted</b>	189,459	—	—	—	189,459
<b>Total net position</b>	\$ 1,457,250	\$ 395,597	\$ 125,789	\$ —	\$ 1,978,636

See accompanying independent auditors' report.

Schedule IV

MASSACHUSETTS PORT AUTHORITY

Combining Schedule of Revenues, Expenses, and Changes in Net Position

Year ended June 30, 2015

(In thousands)

	<u>Authority Operations</u>	<u>PFC Program</u>	<u>CFC Program</u>	<u>Combined Totals</u>
Operating revenues:				
Aviation rentals	\$ 185,953	\$ —	\$ —	\$ 185,953
Aviation parking	149,155	—	—	149,155
Aviation shuttle bus	15,717	—	—	15,717
Aviation fees	135,044	—	—	135,044
Aviation concessions	82,662	—	—	82,662
Aviation operating grants and other	3,894	—	—	3,894
Maritime fees, rentals and other	68,435	—	—	68,435
Real estate fees, rents and other	22,069	—	—	22,069
Total operating revenues	<u>662,929</u>	<u>—</u>	<u>—</u>	<u>662,929</u>
Operating expenses:				
Aviation operations and maintenance	256,519	—	—	256,519
Maritime operations and maintenance	54,231	—	—	54,231
Real estate operations and maintenance	10,428	—	—	10,428
General and administrative	59,064	—	—	59,064
Payments in lieu of taxes	19,282	—	—	19,282
Pension and other post-employment benefits	14,844	—	—	14,844
Other	8,005	—	—	8,005
Total operating expenses before depreciation and amortization	<u>422,373</u>	<u>—</u>	<u>—</u>	<u>422,373</u>
Depreciation and amortization	<u>173,058</u>	<u>39,850</u>	<u>14,250</u>	<u>227,158</u>
Total operating expenses	<u>595,431</u>	<u>39,850</u>	<u>14,250</u>	<u>649,531</u>
Operating income (loss)	<u>67,498</u>	<u>(39,850)</u>	<u>(14,250)</u>	<u>13,398</u>
Nonoperating revenues and (expenses):				
Passenger facility charges	—	65,807	—	65,807
Customer facility charges	—	—	30,768	30,768
Investment income	5,953	1,068	384	7,405
Net (decrease)/increase in the fair value of investments	516	(5)	16	527
Other revenues	10,040	—	51	10,091
Settlement of claims	—	—	—	—
Terminal A debt service contribution	—	(10,918)	—	(10,918)
Other expenses	171	(358)	(769)	(956)
Gain on sale of equipment	180	—	—	180
Interest expense	(49,491)	(4,033)	(11,305)	(64,829)
Total nonoperating (expense) revenue, net	<u>(32,631)</u>	<u>51,561</u>	<u>19,145</u>	<u>38,075</u>
Increase in net position before capital contributions	34,867	11,711	4,895	51,473
Capital contributions	<u>55,951</u>	<u>—</u>	<u>2</u>	<u>55,953</u>
Increase in net position	90,818	11,711	4,897	107,426
Net position, beginning of year	<u>1,366,432</u>	<u>383,886</u>	<u>120,892</u>	<u>1,871,210</u>
Net position, end of year	<u>\$ 1,457,250</u>	<u>\$ 395,597</u>	<u>\$ 125,789</u>	<u>\$ 1,978,636</u>

See accompanying independent auditors' report.



Report

# **Boston Logan International Airport Market Analysis**

June 15, 2017

Submitted to:  
Massachusetts Port Authority

Submitted by:  
ICF  
100 Cambridgepark Drive, Suite 501  
Cambridge, MA 02140

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June 15, 2017

Massachusetts Port Authority  
One Harborside Drive, Suite 200S  
East Boston, MA 02128-2909

Re: Boston Logan International Airport  
Market Analysis

Dear Members of the Authority:

This study includes an analysis of the underlying economic basis for air travel demand at Logan International Airport ("Logan Airport" or the "Airport") and a review of current and long-term traffic and air service trends at the Airport. In this report, ICF also presents an overview of the current state of the U.S. aviation industry and the potential impact of disruption in service in the case of further airline mergers or airline liquidations. Finally, this report provides a review and opinion of the Massachusetts Port Authority's aviation activity projections for Logan Airport.

The analysis used in this report is consistent with industry practices for similar studies in connection with airport bond issuances. ICF has relied on various published economic and aviation statistics, forecasts and information, in addition to statistics provided directly by the Massachusetts Port Authority. ICF believes that these sources are reliable; however, ICF's opinion could vary materially should some of these sources prove to be inaccurate.

ICF's opinions are based upon historical trends and expectations that it believes are reasonable. Some of the underlying assumptions, which are detailed explicitly or implicitly in this report, may or may not materialize because of unanticipated events or circumstances. ICF's opinions could vary materially should any key assumption prove to be inaccurate.

Sincerely,

ICF

ICF

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## TABLE OF ACRONYMS/GLOSSARY

Term	Definition
<b>Ancillary Revenue</b>	Non-fare related revenue including fees for baggage, reservations and cancellations, early boarding, premium seating, onboard retail and hotel and car rental commissions.
<b>Large Hub</b>	Airports that enplane at least 1.0 percent of total annual US passenger enplanements (FAA).
<b>Medium Hub</b>	Airports that enplane at least 0.25 percent but less than one percent of total annual passenger enplanements in the US (FAA).
<b>Small Hub</b>	Airports that enplane at least 0.05 percent but less than 0.25 percent of total annual passenger enplanements in the US (FAA).
<b>Nonhub</b>	Airports that enplane more than 10,000 passengers but less than 0.05 percent of total annual passenger enplanements in the US (FAA).
<b>Large jet</b>	Jet aircraft over 90 seats (FAA).
<b>Low cost carrier (LCC)</b>	The opposite of a network carrier, an LCC typically offers fewer amenities and lower fares; often minimizes the number of aircraft types operated in order to lower costs. In the U.S., there are seven LCCs in operation: Allegiant Air, Frontier Airlines, JetBlue, Southwest Airlines, Spirit Airlines, Sun Country Airlines, and Virgin America.
<b>Major carrier</b>	Major airlines are defined by the U.S. DOT as those exceeding \$1 billion per year in revenue and include Allegiant Air, American, Alaska Airlines, Delta Air Lines, Frontier Airlines, Hawaiian Airlines, JetBlue, Southwest Airlines, Spirit Airlines, United Airlines, and Virgin America.
<b>Network carrier (or full service)</b>	A carrier that operates a hub-and-spoke route structure with more amenities included than low cost carriers; typically offers multiple classes of service (e.g., economy, business, first). Also known as a "legacy carrier". In the U.S., American, Delta, United, Alaska and Hawaiian are considered to be network carriers.
<b>Origin &amp; Destination (O&amp;D)</b>	A measure from the point of origination of a passenger to the final destination. It is the true trip of the passenger, although the passenger may change flights and planes at least once during the journey. It allows carriers to determine where their true business lies.
<b>Regional carrier</b>	Carriers operating smaller piston, turboprop, and regional jet aircraft (up to 90 seats) to provide connecting passengers to the larger carriers (FAA).
<b>Ultra-low cost carrier (ULCC)</b>	A type of low cost carrier operating a business model with extreme unbundling of services. The purchase of a ticket on an ULCC typically covers only the seat and does not include seat choice, food or drink, checked or carry-on luggage, or a paper boarding pass - all amenities available for additional a la carte purchase. In this report, three ULCCs are discussed: Allegiant Air, Frontier Airlines and Spirit Airlines. All three ULCCs are also considered major carriers.
<b>Yield</b>	Passenger ticket revenue per seat mile, excluding fees paid for ancillary products and services.

	Definition	Acronym	Definition
<b>ASM</b>	Available Seat Miles	O&D	Origin and Destination
<b>CAGR</b>	Compound Annual Growth Rate	RASM	Revenue per Available Seat Mile
<b>CASM</b>	Cost per Available Seat Mile	RJ	Regional Jet
<b>CY</b>	Calendar Year	RPM	Revenue Passenger Miles
<b>GA</b>	General Aviation	TAF	Terminal Area Forecast
<b>LCC</b>	Low Cost Carrier	ULCC	Ultra Low Cost Carrier

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## 1. INTRODUCTION AND KEY FINDINGS

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### 1.1 Introduction

The Massachusetts Port Authority (“Massport” or the “Authority”) retained ICF International (“ICF”) to perform a market analysis of the Boston Logan International Airport (“Logan” or “Logan Airport” or the “Airport”) in connection with the issuance by Massport of its Revenue Bonds, Series 2017-A (AMT) (the “Series 2017 Bonds”).

This study includes an analysis of the underlying economic basis for air travel demand at Logan Airport and a review of current and long-term traffic and air service trends at the Airport. In this market analysis, ICF also presents an overview of the current state of the U.S. aviation industry and the potential implications for Logan. In addition, ICF presents its review and opinion of Massport’s aviation projections for Logan Airport.

ICF relied on information from a variety of published sources as the basis of this study, including data from the U.S. Department of Transportation (“DOT”), the Federal Aviation Administration (“FAA”), the Official Airline Guide (“OAG”), Innovata Airline Schedules (“Innovata”) and industry information and surveys, as well as financial records, airport planning documents and aviation activity records provided by Massport. Advance OAG and Innovata schedules for July 2017 are used throughout this report. Historical trends for Logan, other large hub U.S. airports and the U.S. are generally reported through calendar year (“CY”) 2016. All years throughout this report are on a calendar year basis unless otherwise stated. Some analyses rely on the latest available data from the U.S. DOT Origin-Destination (“O&D”) Passenger Survey (available through CY 2016), the U.S. DOT T-100 Database for U.S. flag airlines (available through CY 2016), and the U.S. DOT Form 41 database (CY 2016). For sources where fourth quarter 2016 data was not available, the data are reported for the four quarters ended 3Q 2016 (“YE 3Q 2016” or “YE3Q16”). Airport activity data that includes foreign flag airlines is reported for the 12 months ended September 2016, as September 2016 was the most recent data available for foreign flag carriers in the U.S. DOT T-100 database when this report was prepared.

As part of this study, ICF did not evaluate, and does not offer an opinion on, the feasibility of the engineering, design plans or costs of any of the projects expected to be financed with proceeds of the Series 2017 Bonds. ICF did not engage in a legal review of lease agreements or engineering contracts.

ICF’s opinions are based upon historical trends and expectations that it believes are reasonable. Some of the underlying assumptions, which are detailed explicitly or implicitly elsewhere in this report, may or may not materialize because of unanticipated events or circumstances. ICF’s opinions could vary materially should any key assumption prove to be inaccurate.

The opinions expressed herein are not given as an inducement or endorsement for any financial transaction. This report reflects ICF’s expert opinion and best judgment based on the information available to it at the time of its preparation. ICF does not have, and does not anticipate having, any financial interest in this transaction.

### 1.2 Key Findings

#### Logan Airport Strengths

- ▶ The 17<sup>th</sup> busiest U.S. airport in North America, with 36.3 million passengers in CY 2016 (representing a 8.5 percent increase over CY 2015).<sup>1</sup>
- ▶ Consistently one of the top U.S. domestic origin-destination (“O&D”) markets and fastest growing markets (currently Logan is 5<sup>th</sup> fastest growing among U.S. large hub airports since 2011).
- ▶ A highly competitive market, not dominated by a single airline because of Logan’s Northeast geographic location, its large O&D base and lack of a connecting airline hub operation.

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<sup>1</sup> ACI 2016 Preliminary Statistics.

- ▶ A strong O&D base of traffic; Boston has the third highest O&D share (versus connecting) for domestic traffic among U.S. large hub airports, with O&D passengers representing 97.0 percent<sup>2</sup> of domestic passengers using the Airport for 2016.
- ▶ A key focus city for JetBlue, the leading airline at the Airport in terms of passengers in CY 2016.
- ▶ A high level of Low Cost Carrier (“LCC”) service, which has been fueling growth in domestic seat capacity.
- ▶ A proven ability to manage gate utilization through a preferential gate use policy, the use of short-term leases and effective recapture and sublet provisions in its leases.

#### Boston Market Fundamentals

- ▶ The 10<sup>th</sup> most populated Metropolitan area in the nation in 2016.<sup>3</sup>
- ▶ A high-income population area, with an average per capita income in 2015 that was 30.4 percent higher than the national average.<sup>4</sup> This per capita wealth advantage is expected to continue at least through 2030.<sup>5</sup>
- ▶ A well-diversified, travel intensive regional economic base with core industries including high technology, biotechnology and pharmaceuticals, health care, financial services, higher education and tourism.

#### Aviation Activity and Service Trends

- ▶ Sustained long-term average passenger growth – despite periodic declines resulting from economic slumps, external shocks and short-term service disruptions, passenger traffic grew at an average annual rate of 2.7 percent from CY 2006 to CY 2016 (compared to a national average of 1.0 percent during the same period).
- ▶ Improving operational efficiency as airlines use larger average aircraft with higher load factors. Logan handled 360,000 (excluding general aviation) aircraft operations (takeoffs and landings) in CY 2016 compared to 434,000 in CY 2001. As a result of the airlines’ greater focus on maintaining high load factors, the overall average passengers per operation climbed by more than 30 percent from 2006 to 2016 (from 73 to 100 passengers per operation).
- ▶ Significant expansion of international service in recent years with the arrival of new foreign-based carriers. New long-range, fuel-efficient smaller widebody aircraft (such as the Boeing 787 and the newly introduced Airbus A350) have benefited Logan’s international service, given that Boston is the type of medium sized international market that these aircraft were designed to serve.
- ▶ The 7<sup>th</sup> largest U.S. gateway for transatlantic traffic as of YE 3Q 2016.

In summary, by most key market indicators, Logan Airport has been one of the strongest performing airports in the U.S. over the past five years. The Airport’s performance reflects the underlying strengths of the Boston market. Logan serves a market with a large O&D passenger base, above average income levels, a travel intensive economic base and attractiveness as a destination.

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<sup>2</sup> Source: U.S. DOT O&D Survey via Database Products, CY 2016. Total O&D passengers account for 94.5 percent of overall passengers at Logan Airport, including domestic and international passengers, CY 2016.

<sup>3</sup> Source: United States Census Bureau, *Annual Estimates of the Resident Population of Metropolitan and Micropolitan Statistical Areas: April, 2010 to July 1, 2016*, (for the Boston-Cambridge-Newton, MA-NH Metropolitan Statistical Area).

<sup>4</sup> Woods & Poole Economics. For the Boston Metro area. Latest actual data is 2014.

<sup>5</sup> Ibid.

### Massport Activity Forecasts for Logan Airport

- ▶ Massport's planning forecast, used for planning of facilities and operations, projects passenger traffic at Logan Airport to increase by 2.1 percent per year between CY 2016 and CY 2021. Over the longer term, passenger traffic is forecasted to reach approximately 40 million passengers in CY 2021 and an expected level of between 42 million and 48 million sometime after CY 2030.
- ▶ Massport's financial forecast, used for financial planning purposes and generally more conservative than the planning forecast, projects passenger traffic at Logan Airport to increase at an average annual rate of 1.9 percent over the next five years reaching 39.8 million passengers in CY 2021.
- ▶ ICF's view is that these forecasts for Logan Airport represent reasonable and conservative projections of future activity at the Airport, given the maturity of the Boston market and the historical volatility of the airline industry and the past historical performance of the Airport.

### 1.3 Report Layout

This chapter highlights the key findings of our report. Chapter 2 provides an overview of the U.S. aviation industry including recent trends; Chapter 3 discusses the demographic and economic environment in which Logan Airport operates; Chapter 4 provides a detailed description of airlines serving the Airport, their current service levels, passenger trends, as well as operations and cargo growth; and Chapter 5 presents and reviews Massport's planning and financial traffic forecasts.

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## 2. INDUSTRY OVERVIEW

### 2.1 Introduction

The U.S. airline industry posted strong profits in 2016, benefitting from low fuel prices, a strong U.S. economy and robust passenger traffic demand. Major U.S. airlines<sup>6</sup> earned an operating profit of \$24.9 billion in CY 2016, slightly down from the record profits of \$27.6 billion in CY 2015.<sup>7</sup> All major U.S. airlines posted a profit, with American, Delta, United and Southwest each seeing operating incomes in the range of \$3.8 billion-\$7.0 billion for CY 2016. Airlines are benefitting from the decline in fuel cost as oil prices reached 10-year lows in 1Q 2016. Passenger demand has continued to strengthen, with U.S. industry enplanements exceeding pre-recession levels for the second consecutive year in 2016. Trends in industry consolidation, airline capacity discipline, diversification of revenues through ancillary sources<sup>8</sup> and aircraft fleet renewal all continue to be seen, further contributing to carrier profitability and operational performance.

U.S. carrier capacity growth accelerated in 2016. Following the 2008-2009 recession, carriers maintained tight capacity discipline for years, emphasizing cautious capacity increases and the use of right-sized aircraft to serve markets. Strong traffic growth and current low fuel prices, however, have allowed U.S. carriers to add capacity at a faster rate. Overall U.S. airline seat capacity increased year-over-year by 3.5 percent in 2016 compared to 3.3 percent in 2015.<sup>9</sup> In 2016, domestic capacity grew by 3.6 percent year-over-year, while international capacity grew by 1.8 percent. New aircraft technology in the form of long range, fuel-efficient widebody aircraft such as the Boeing 787 and Airbus A-350 enabled an increase in nonstop international service. Both network carriers and LCCs added capacity in 2016, with LCCs continuing to expand at a faster rate.

The outlook for U.S. airline performance in the near-term is strong. The International Air Transport Association (“IATA”) forecasts that North American carriers (including airlines of all sizes) will earn a net profit of approximately \$18.1 billion in 2017, down 10.8 percent from the \$20.3 billion net profit expected in 2016.<sup>10</sup> Fuel price volatility remains a significant challenge. Oil prices, which dropped to below \$40 per barrel as of April 2016, have risen to \$52 per barrel in March 2017, and increased fuel costs could affect future airline profits and fleet renewals. Passenger demand and airline capacity growth, however, are expected to remain strong through the upcoming year. U.S. airports, especially large hub airports like Logan,<sup>11</sup> will continue to see expanded airline services by both network carriers and LCCs, resulting in strong passenger growth.

### 2.2 History of the U.S. Aviation Industry

#### 2.2.1 Historical System Shocks and Recoveries

The airline industry is extremely cyclical and highly sensitive to economic and political events. Exhibit 2-1 shows the declines and recoveries in historical U.S. airline traffic since 1970. Industry traffic has declined during all of the economic recessions of the past decades. Other “shocks” such as the PATCO<sup>12</sup> air traffic controllers strike in the early 1980s, the Gulf War in 1990/91, various airline liquidations and reorganizations in the early 1990s and 2000s, the events of 9/11, the great recession (of 2008-2009) and volatile oil prices have also challenged and changed the airline environment significantly, causing passenger travel declines and gradual recovery cycles.

In all cases, the industry recovered over time and growth in air passenger traffic resumed. In some cases, significant capacity reductions followed shocks – e.g. bankruptcy reorganizations caused many carriers to

<sup>6</sup> Major airlines are defined by the U.S. DOT as those exceeding \$1 billion per year in revenue and include Allegiant, American, Alaska, Delta, Frontier, Hawaiian, JetBlue, Southwest, Spirit, United and Virgin America. Following their merger in December 2013, American Airlines and US Airways are now combined and will be referred to as American Airlines throughout this report.

<sup>7</sup> U.S. DOT Form 41.

<sup>8</sup> The primary sources of ancillary revenues include fees for baggage, reservations and cancellations, early boarding, premium seating, onboard retail and hotel and car rental commissions.

<sup>9</sup> Innovata Airline Schedules.

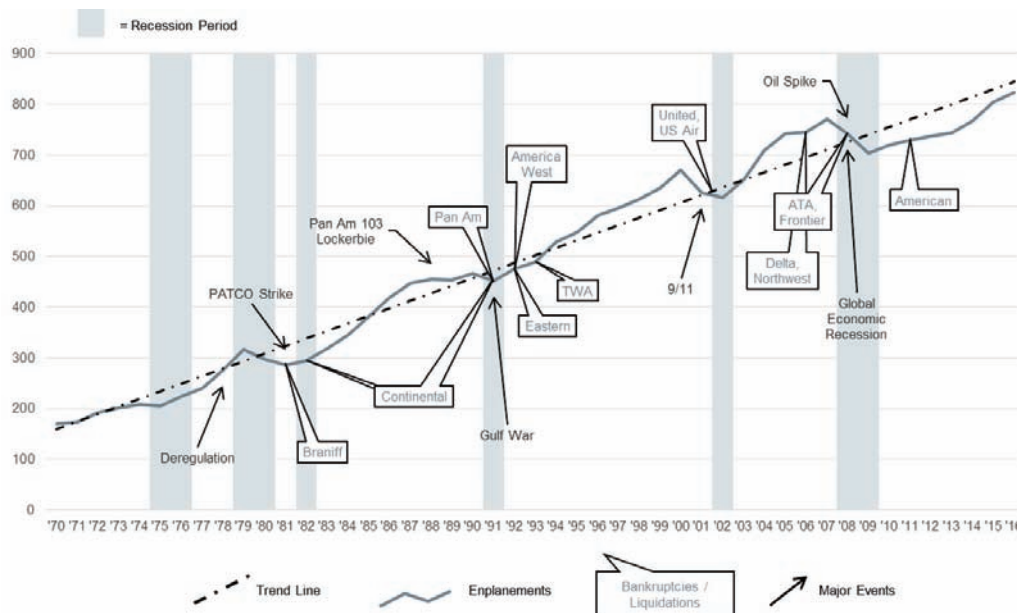
<sup>10</sup> IATA, “Another Strong Year for Airline Profits in 2017” press release (December 8, 2016).

<sup>11</sup> The FAA defines large hubs as airports that enplane at least one percent of total U.S. air passengers. There are currently 29 large hub airports, excluding Honolulu (HNL).

<sup>12</sup> Professional Air Traffic Controllers Organization.

reduce their fleets and networks, and U.S. airlines reduced capacity by approximately 13 percent in the aftermath of 9/11. However, in each case there has been a gradual rebuilding of capacity as traffic growth resumed. From CY 1970 to CY 2016, total U.S. domestic and international passenger enplanements grew at an average annual rate of 3.5 percent.

**Exhibit 2-1: Airline Industry Shocks and Recoveries, U.S. Total Enplanements (In Millions, 1970 to 2016)**



Source: Airlines for America (A4A)

Similar to the recoveries seen after other historical shocks, passenger traffic has been recovering in recent years following the sharp decline associated with the global economic recession in 2008-2009. Traffic fell in 2008 and 2009 as economic recession linked to the U.S. subprime mortgage crisis depressed passenger demand. Traffic also declined in response to drastic capacity cuts and fare increases introduced by airlines due to a spike in fuel prices in 2008. Passenger traffic recovery began in 2010 as economic conditions slowly improved. Traffic growth strengthened over the past two years and industry enplanements exceeded pre-recession levels for the second consecutive year in 2016.

### 2.2.2 Airline Consolidation and Partnerships

The events of 9/11 and the difficult operating conditions caused by high fuel prices and global recession led to a number of airline bankruptcies and mergers over the past 15 years. Network carriers filed for Chapter 11 protection to reorganize and lower operating costs. Delta, Northwest, United, US Airways and American all entered Chapter 11 between 2001 and 2011, while many smaller carriers including American Trans Air, Skybus Airlines and Aloha Airlines ceased operations. Overall, U.S. airlines have emerged from restructuring more streamlined, poised to ride out the challenging operating environment with lower costs and stricter capacity discipline.

U.S. airline industry consolidation included many high profile mergers and acquisitions. Three mergers among network carriers each produced the world’s largest carrier in terms of passengers. Delta and Northwest, both of which emerged from bankruptcy in 2007, combined (under the name “Delta”) in October 2008; United and

Continental merged (under the name “United”) in November 2010; and American Airlines and US Airways merged (under the name “American Airlines”) in December 2013.<sup>13</sup>

The trend of airline consolidation has also extended to LCCs, with mergers between Frontier Airlines and regional airline Midwest (keeping the “Frontier” brand) in April 2010<sup>14</sup> and between Southwest and AirTran (under the name “Southwest”) in April 2011. The Southwest and AirTran merger solidified Southwest’s position as the largest LCC in the U.S. With the incorporation of AirTran operations, Southwest is currently the third largest domestic carrier by seat capacity after American and Delta. Most recently, in December 2016, Alaska Airlines completed its acquisition of San Francisco-based LCC Virgin America. The merger between Alaska and Virgin America created a strong West Coast carrier and made Alaska the fifth largest domestic carrier in terms of seat capacity.

As a result of airline mergers, capacity has become more concentrated among a few dominant carriers over the last five years. In July 2017, the top four domestic carriers by seat capacity – American, Delta, Southwest and United – are scheduled to account for over 80 percent of total domestic capacity, up from 70 percent in July 2012.

**Exhibit 2-2: U.S. Airline Domestic Service Concentration – Share of Weekly Seat Capacity  
(Advance Schedules, July 2017)**

Rank	Airline	Capacity Share	Rank	Airline	Capacity Share
1	American	22.4%	6	JetBlue	4.3%
2	Southwest	21.3%	7	Spirit Airlines	3.1%
3	Delta	21.1%	8	Frontier	2.0%
4	United	15.4%	9	Allegiant Air	1.8%
5	Alaska/Virgin	4.6%	10	Hawaiian Air Lines	1.4%
	Other	2.5%			
	<b>Total</b>	<b>100.0%</b>			

Source: Innovata, July 2017.

Airline consolidation has also progressed through the creation of global airline alliances and joint ventures (JVs). Three major global alliances were created between 1997 and 2000 and are still in existence today: Star Alliance, SkyTeam and Oneworld. These alliances allowed airlines to combine their network to create a broader global network, jointly market flights, share lounges, offer reciprocal frequent flyer program benefits, and align schedules to maximize connectivity and efficiency of operations. Current airline membership in the three major alliances is shown in Exhibit 2-3. In recent years, antitrust immunity has also been granted to a number of JVs within the global alliances, allowing carriers to more closely coordinate operations, including pricing, and increase cost savings in international markets. Most of the world’s major airlines are members of JV partnerships today, such as the Delta-Alitalia-Air France-KLM Transatlantic JV, the American Airlines-Japan Airlines Transpacific JV, and Emirates and Qantas’ Dubai-Australia JV, to name a few. As customers come to expect seamless global travel and airlines look to expand capacity while mitigating high cost and risk, the rise of immunized JVs is a trend that is expected to continue to dominate international operations in coming years.

<sup>13</sup> American and US Airways began operating under the same operating certificate in April 2015.

<sup>14</sup> In December 2013, Republic Airways Holdings sold Frontier Airline to private equity firm Indigo Partners LLC.

**Exhibit 2-3: Airline Alliance Membership (as of July 2017)**

Oneworld	SkyTeam		Star
Air Berlin	Aeroflot	Middle East Airlines	Adria Airways
American Airlines	Aerolineas Argentinas	Saudia	Ethiopian Airlines
British Airways	Aeromexico	Tarom	EVA Air
Cathay Pacific	Air Europa	Vietnam Airlines	LOT Polish Airlines
Finnair	Air France	Xiamen Airlines	Lufthansa
Iberia	Alitalia		Scandinavian Airlines
Japan Airlines	China Airlines		Shenzhen Airlines
LAN	China Eastern		Singapore Airlines
TAM Airlines	China Southern		South African Airways
Malaysia Airlines	Czech Airlines		SWISS
Qantas	Delta Air Lines		TAP Portugal
Qatar Airways	Garuda Indonesia		THAI
Royal Jordanian	Kenya Airways		Turkish Airlines
S7 Airlines	KLM		United Airlines
Sri Lankan Airlines	Korean Air		Egyptair

Source: Alliance websites.

Unlike many airports that predominantly cater to flights by one specific carrier or alliance, Boston Logan's service is less concentrated, encompassing members of all three major alliances, as well as unaligned LCCs. This means that the Airport is less susceptible to detrimental changes in service levels due to potential future U.S. airline consolidation or changes in carrier network strategy. The largest carrier at Logan Airport, JetBlue, is not a member of any of the three alliances, but has shown willingness to enter into interline and codeshare partnerships with foreign carriers serving the Airport. As shown in section 4 (exhibit 4-7), 49 percent of weekly departing seats at Logan are unaligned. This has been an important factor in Logan Airport's ability to attract new foreign carrier service in recent years.

## 2.3 Airline Capacity and Passenger Traffic Trends

In the wake of the 2008-2009 economic and financial crises, a new trend of capacity discipline emerged among U.S. airlines. The majority of carriers remained cautious in growing capacity, focusing on serving markets with the right capacity and improving profitability. Enplanement growth was slow as the economy recovered gradually, but has been strengthening in recent years. Carrier capacity growth continued to increase in 2016, with both network carriers and LCCs adding domestic capacity and expanding in international markets.

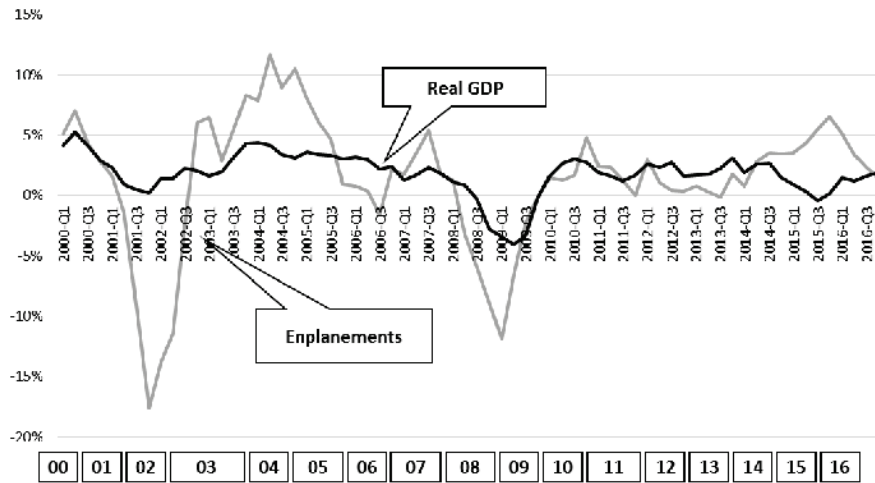
### 2.3.1 Passenger Traffic Trends

Air travel demand has historically demonstrated a strong correlation to the economy. Airline passenger traffic normally declines during an economic recession with passenger growth resuming during subsequent economic expansions. This correlation can be seen clearly over the past decade as passenger demand fell during the global economic recession and recovered as the economy improved (Exhibit 2-4).

The year 2008 marked the beginning of a nationwide economic downturn following the global credit-related financial crisis. U.S. GDP decreased year-over-year for the first time in well over a decade. Fuel costs also reached an unprecedented high in 2008, forcing carriers to cut capacity and raise fares. Carriers passed on fuel surcharges to consumers in efforts to offset the massive increases in operating costs. Passenger traffic declined sharply as a reaction to rising fares and service cuts.

Passenger traffic recovery began in late 2009 as the GDP decline started to moderate. Enplanement growth was slow through mid-2014, corresponding to the slow pace of the economic recovery in the U.S. Airline service cuts and higher airfares due to high fuel prices also constrained passenger traffic growth. Year-over-year enplanement growth in the U.S. began to strengthen in 2014 and increased to 3.6 percent in 1Q 2015 and 6.5 percent in 4Q 2015. Despite modest economic growth, domestic air travel demand in 2015 grew at the fastest pace since 2007. Factors contributing to this growth include falling fuel cost, decreasing yield, and the rapid expansion of domestic ultra-low cost carriers (ULCCs) such as Spirit and Allegiant. In 2016, enplanement growth has slowed down to 1.5 percent year-over-year growth in 4Q 2016, tracking economic growth more closely.

**Exhibit 2-4: U.S. Scheduled Carrier Enplanements and U.S. Real GDP, Percent Change Over Prior Year (1Q 2000 to 4Q 2016)**

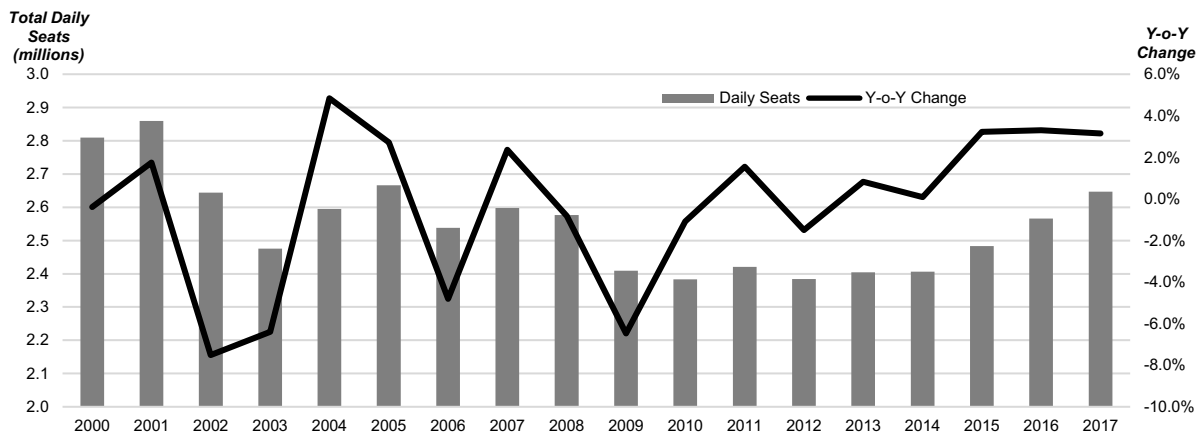


Source: U.S. DOT Form 41 Database; U.S. DOC, Bureau of Economic Analysis.

**2.3.2 Capacity Trend Review**

As illustrated in Exhibit 2-5, U.S. domestic capacity has been increasing since 2014, reaching over 2.6 million daily seats in July 2017, surpassing the peak pre-recession levels of 2007. In 2008-2009, carriers implemented widespread service cuts in response to a spike in fuel prices and the global economic recession. While capacity declines moderated in subsequent years as the economy gradually recovered, seat capacity remained relatively flat through 2014, reflecting industry consolidation and airlines' continued adherence to capacity discipline. Benefiting from strengthening travel demand and a decline in oil prices, carriers are increasing domestic capacity by approximately 3.2 percent per year from 2015 through 2017.

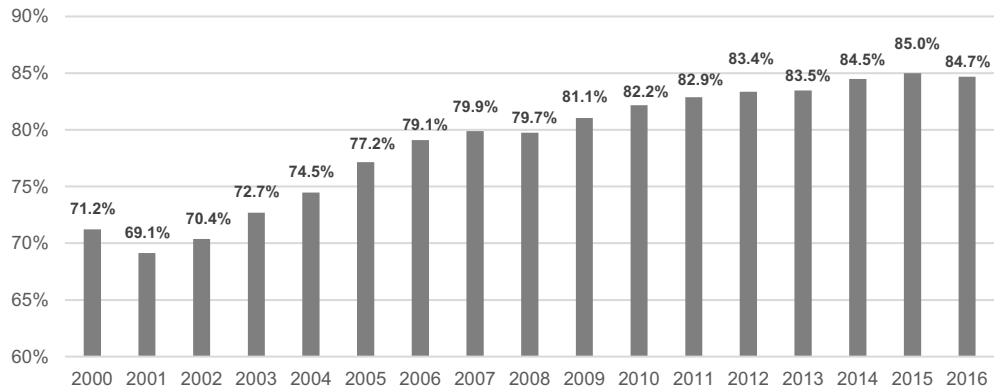
**Exhibit 2-5: U.S. Domestic Scheduled Daily Seats and Year Over Year Change (July 2000 to July 2017)**



Note: July 2017 is using advance schedules.  
Source: OAG, Innovata.

Tight capacity control and better revenue management techniques have pushed passenger load factors to all-time highs. Exhibit 2-6 shows the continuing upward trend in U.S. domestic airline load factors since 2000. Following a dip in the average load factor after 9/11, the average load factor rose steadily to approximately 80 percent in 2007. Load factor growth stalled slightly in 2008 as the economic recession took hold. Since 2008, load factors have continued to rise, reaching 84.7 percent in 2016. The very slight decline in load factor between 2015 and 2016 is a result of seat capacity increases implemented by U.S. carriers over the last three years.

**Exhibit 2-6: U.S. Domestic Load Factors  
(CY 2000 to November 2016)**



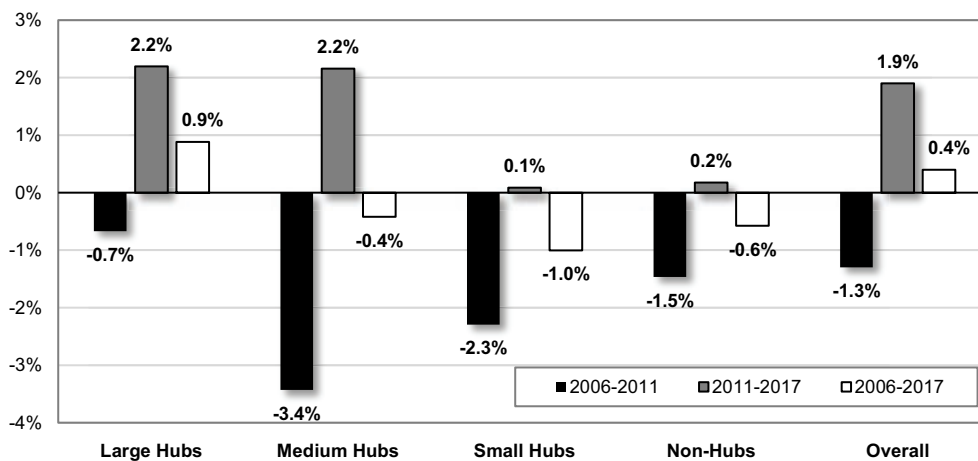
Source U.S. DOT, T-100 Database.

2.3.2.1 Capacity Trends by Airport Type

An important trend in the U.S. domestic market is the shifting allocation of seat capacity by airport hub size. Over the past decade airline capacity has affected large hub, medium hub, small hub, and non-hub airports differently, and this has benefited large hub airports like Logan. Exhibit 2-7 shows the percent change in overall airline seat capacity at U.S. airports by airport size since 2006. Capacity reductions implemented by carriers due to the 2008-2009 recession and 2008 fuel spike negatively impacted all airports. However, medium hub, small hub and non-hub airports were affected much more significantly than large hub airports, as carriers moved to cut service in secondary markets and less profitable routes.

Between 2006 and 2011, the U.S. industry saw an overall decline in seat capacity of 1.3 percent. However, seat capacity at medium hub airports saw a decline of 3.4 percent, compared to a 2.3 percent decline at small hub airports, and a negligible decline of 0.7 percent at large hub airports. US airlines have shifted their strategy over the past five years to concentrate growth at large and medium hub airports. Between 2011 and 2017, the overall U.S. industry saw an increase in seat capacity of 1.9 percent. Capacity at large hub airports like Boston is up by 2.2 percent, while small and non-hub airports have remained essentially flat, with an overall capacity increases of 0.1 and 0.2 percent, respectively, over the same period.

**Exhibit 2-7: Total International and Domestic Seat Capacity Growth by U.S. Airport Type, Percent Change  
(CY 2006 to CY 2017)**



Note: Based on FAA 2015 Hub Classification.  
Source: Innovata.

### 2.3.2.2 Network Carriers

As described in Section 2.2, U.S. network carriers (which currently include five major carriers: Alaska, American, Delta, Hawaiian and United) have been forced to undergo major restructuring to survive in the challenging operating environment since 2001. Following drastic capacity reductions in 2008-2009, network carriers have started to grow capacity again in recent years. Growth in more profitable markets, however, continues to be balanced by continued capacity cuts on unprofitable routes. Overall U.S. network carrier capacity increased by 1.6 percent in 2016 and is expected to increase by another 1.6 percent in 2017.<sup>15</sup> Capacity increases by carrier in 2017 are shown in Exhibit 2-8 below.

**Exhibit 2-8: Network Carriers Domestic and International Seat Capacity Growth by Airline, Percent Change (July 2016 vs July 2017)**

Carrier	Percent Change		
	Domestic	International	Total
American Airlines	-1.7%	1.3%	-1.2%
Delta Air Lines	1.0%	1.2%	0.9%
United Airlines	6.7%	0.3%	5.2%
Alaska Airlines	6.0%	14.1%	6.5%
Hawaiian Airlines	0.6%	24.7%	2.7%
<b>Total</b>	<b>1.7%</b>	<b>1.5%</b>	<b>1.6%</b>

Source: Innovata.

- ▶ Following its merger with US Airways in December 2013, American Airlines surpassed Delta to become the largest U.S. airline in terms of scheduled seat capacity. In July 2017, as the merged airline continues to consolidate operations, American's capacity is scheduled to decrease by 1.2 percent year-over-year, with domestic capacity expected to decline 1.7 percent, while international capacity is expected to grow by 1.3 percent.
- ▶ In July 2017, Delta is expected to grow its domestic seat capacity by 1.0 percent and international seat capacity by 1.2 percent. Delta's international capacity growth to Mexico is expected to be particularly strong, increasing by 14.4 percent in 2017, offsetting an 8.0 percent reduction in service to Asia over the past two years.<sup>16</sup>
- ▶ United is expected to grow system capacity significantly by 5.2 percent in July 2017, following two years with little capacity growth. In 2017, domestic seat capacity is expected to increase with a 6.7 percent growth over 2016, while international capacity is expected to increase by 0.3 percent.
- ▶ Alaska Airlines has continued to show strong capacity growth over the past two years. Alaska's system capacity is expected to increase by 6.5 percent in July 2017, with capacity increases primarily in domestic markets, although Alaska also operates limited service to Mexico, Central America, and Canada. Following the merger of Alaska and Virgin America (approved in December 2016), the combined system capacity of the merged airline is expected to increase by 5.6 percent in July 2017.
- ▶ Hawaiian Airlines has also shown consistent growth over the past two years, with system capacity expected to continue to increase by 2.7 percent in July 2017. This growth will be driven by Hawaiian's expanding international capacity, with expanded international services to Japan in 2017.

<sup>15</sup> Innovata Schedules, based on July of every year.

<sup>16</sup> July 2015 to July 2017.

### 2.3.2.3 Low Cost Carriers

U.S. LCCs (including Southwest, JetBlue, Frontier, Spirit, Virgin America, Sun Country and Allegiant) rose to prominence in the early 2000s, expanding rapidly and gaining share in the domestic market. When network carriers rationalized domestic capacity and focused on more profitable international flying, LCCs seized the opportunity to increase their domestic market share. While LCCs provided just over 15.0 percent of domestic seat capacity in the U.S. in 2000, they will account for approximately 33.0 percent of domestic seats, with Southwest having 21.4 percent market share, in July 2017.

In recent years, LCCs have continued to grow domestic capacity at a faster rate than network carriers, but from a smaller base. All of the LCCs added domestic capacity over the past two years. Overall LCC capacity in the domestic market increased by 6.7 percent year-over-year in July 2016. In July 2017, overall LCC system capacity is expected to increase by another 6.8 percent year-over-year (see Exhibit 2-9).

**Exhibit 2-9: LCC Domestic and International Seat Capacity Growth by Airline, Percent Change (July 2016 vs July 2017)**

Carrier	Percent Change		
	Domestic	International	Total
Southwest Airlines	3.7%	47.8%	4.5%
JetBlue Airways	7.1%	15.6%	8.8%
Virgin America	1.5%	0.0%	1.4%
Spirit Airlines	20.7%	-1.5%	18.6%
Frontier Airlines	10.4%	34.4%	11.2%
Allegiant Air	7.8%	0.0%	7.8%
<b>Total</b>	<b>6.0%</b>	<b>21.2%</b>	<b>6.8%</b>

Source: Innovata.

A new ultra-low cost carrier<sup>17</sup> (ULCC) business model has emerged in recent years, embraced by Allegiant, Spirit and Frontier. The ULCC business model is characterized by unbundling of services. The purchase of a ticket on an ULCC covers only the seat and (depending on the carrier) does not include seat choice, food or drink, checked or carry-on luggage or a paper boarding pass - all amenities available for additional a la carte purchase. Over the past two years, U.S. based ULCCs have rapidly expanded, growing overall capacity by 23.0 percent in July 2016 and 13.9 percent in July 2017. The only ULCC currently serving Logan is Spirit Airlines.

LCCs and ULCCs continue to look actively at international expansion possibilities. JetBlue has already established a strong presence in the Caribbean and Latin America, adding service to over 30 VFR (“Visiting Friends and Relatives”) and leisure markets. In addition, JetBlue has introduced commercial partnerships with more than 30 foreign airlines. Logan has benefited from JetBlue’s expansion of international service, as well as JetBlue’s collaborations with foreign airlines. Since its acquisition of AirTran, Southwest has also taken over AirTran’s existing Caribbean and Mexican routes, becoming positioned for further international expansion. Spirit has also continued to build up gradually a network of Caribbean and Latin America destinations.

Capacity changes expected in July 2017 by LCCs and ULCCs are summarized below:

- ▶ Southwest, the largest LCC and third largest carrier in the U.S. in terms of seat capacity, emerged from service contractions related to its merger with AirTran and resumed capacity growth over the past two years. Southwest is expected to increase system capacity by 4.5 percent in July 2017, with significant international capacity increases planned to the Caribbean, Mexico, and Central America. Southwest is currently the second largest LCC at Logan Airport after JetBlue; while Southwest currently serves domestic markets only from Logan, there is potential for international service in the future.
- ▶ JetBlue is the second largest LCC in the domestic market after Southwest and the largest domestic LCC in terms of international service. JetBlue is expected to increase system capacity by an additional 8.8 percent

<sup>17</sup> ULLCs are a type of LCC. Allegiant, Spirit and Frontier are also included in the LCC category throughout this report.



in July 2017, with a 7.1 percent increase in domestic capacity and a 15.6 percent increase in international capacity. Since launching service at Logan Airport in 2004, JetBlue has grown to become the leading carrier at Logan. JetBlue has indicated interest in continuing to build up operations at Logan on both the domestic and international front.

- ▶ While one of the smaller LCCs, Virgin America has developed a strong brand especially in West Coast markets. Virgin America system capacity is expected to be up 1.4 percent in July 2017 compared to 2016. Following the merger of Alaska and Virgin America (approved in December 2016), the combined system capacity of the merged airline is expected to increase by 5.6 percent in July 2017.<sup>18</sup>
- ▶ ULCCs Spirit Airlines, Frontier and Allegiant are expected to grow system capacity by 18.6 percent, 11.2 percent, and 7.8 percent respectively in 2017.

In recent years, European LCCs have also entered the transatlantic market, benefiting markets like Boston. Norwegian Air Shuttle introduced its first transatlantic service to New York JFK in May 2013 and has now expanded services to numerous other U.S. markets including Boston, Orlando, Fort Lauderdale, Las Vegas, Los Angeles, Oakland and Baltimore/Washington. Norwegian's long haul services from mainland Europe have been made possible in large part by the introduction of the Boeing 787 aircraft, which allows for profitable flying in thinner long haul markets. Iceland-based WOW Air also launched service from Reykjavik to Boston, Baltimore/Washington, San Francisco and Los Angeles.

## 2.4 Fleet Expansion and Changes

### 2.4.1 Aircraft Orders

Aircraft orders are constantly shifting as carriers adjust their order books to reflect market activities, changes to long-range plans and available aircraft financing. The economic and financial crises in 2008-2009 led airlines to make significant cancellations and deferrals of aircraft orders. As airlines returned to profitability in recent years and sought to incorporate more fuel-efficient aircraft into their fleets, aircraft orders have returned to higher levels. Between 2018 and 2025, a total of 1,463 aircraft are scheduled to be delivered to U.S. commercial carriers. Recent aircraft orders have emphasized fuel efficiency, with the incoming aircraft slotted to replace the less efficient MD-80s, DC-9s and older 737s in carrier fleets. In addition, carriers are increasingly placing orders for larger capacity, new generation aircraft such as the Boeing 737 MAX.

As of March 2017, aircraft orders<sup>19</sup> in place for delivery through 2019 are weighted 76 percent for the network carriers and 24 percent for the LCCs (see Exhibit 2-10). LCC deliveries are expected to accelerate in the 2021-2025 period, however, accounting for 37 percent of total orders.

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<sup>18</sup> Virgin America will operate under the Alaska Airlines name.  
<sup>19</sup> Based upon CAPA Fleets, March 2017

**Exhibit 2-10: New Aircraft Deliveries for U.S. Carriers  
(2017 to 2025)**

Carrier	Backlog					Total
	2017	2018	2019	2020	2021-2025	
Alaska	9	18	4	6	9	46
American	47	26	50	50	100	273
Delta	34	62	76	35	28	235
Hawaiian	4	7	8	3	2	24
United	49	35	36	30	100	250
<b>Subtotal - Network</b>	<b>143</b>	<b>148</b>	<b>174</b>	<b>124</b>	<b>239</b>	<b>828</b>
Allegiant	5	7	0	0	0	12
Frontier	5	3	5	11	49	73
JetBlue	12	11	21	28	60	132
Southwest	45	27	15	14	144	245
Spirit	13	14	13	16	18	74
Virgin America	4	6	0	11	19	40
<b>Subtotal - LCC</b>	<b>84</b>	<b>68</b>	<b>54</b>	<b>80</b>	<b>290</b>	<b>576</b>
Other/Regional Carriers	29	22	0	0	264	315
<b>Total</b>	<b>256</b>	<b>238</b>	<b>228</b>	<b>204</b>	<b>793</b>	<b>1,719</b>
Share - Network Carriers	56%	62%	76%	61%	30%	48%
Share - LCCs	33%	29%	24%	39%	37%	34%
Share - Other	11%	9%	0%	0%	33%	18%

Source: CAPA Fleets, accessed March 2017.

Note: Does not include subsidiaries; United Airlines and Republic Airways have seven and 40 aircrafts, respectively, on order without a delivery date, which are not reflected in the table.

Southwest has the highest number of orders among LCCs by a significant margin. Southwest has very aggressive on-order deliveries, expecting to add 245 new aircraft by 2025, though a number of these aircraft will be for fleet replacement purposes. Other LCCs also have large aircraft orders in place. JetBlue has orders for 132 new aircraft and Frontier is expected to add 73 aircraft through 2025. Spirit and Virgin America have 74 and 40 aircraft on order through 2025, respectively.

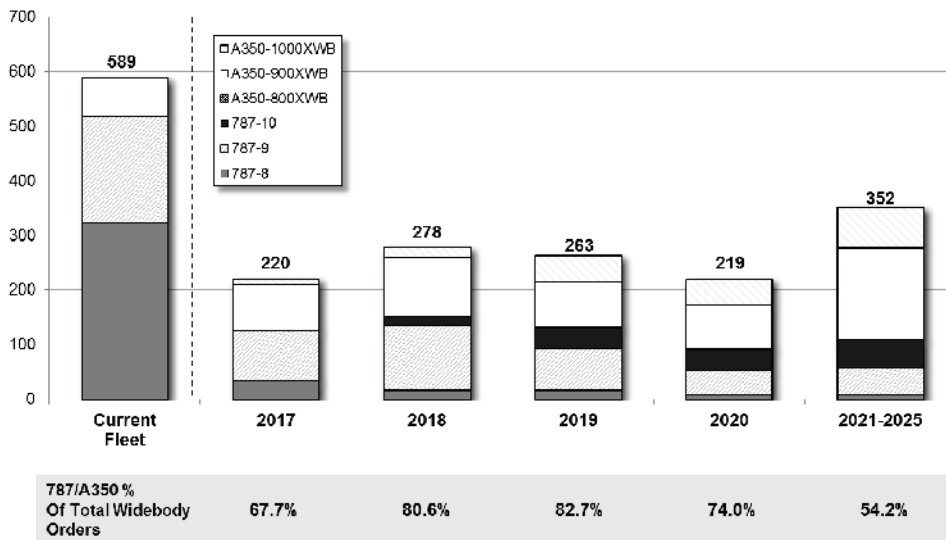
Network carrier new aircraft orders and deliveries for the period through 2019 reflect major fleet replacement programs by a number of carriers. American has large orders for the Boeing 737 MAX and Airbus A321 in place, aimed at replacing the carrier's aging and fuel-inefficient MD-80 fleet. American has a total of 173 aircraft deliveries scheduled for 2017-2020 and is scheduled to receive an additional 100 aircraft through 2025, for a total of 273 new aircraft by 2025, the most of any network carrier. United has 250 aircraft on order, including 17 Boeing 787 Dreamliners. United took delivery of its first 787 in 2012, making it the first North American carrier to receive the aircraft. Delta has 235 aircraft orders through 2025, 45 of which are for the Boeing 737NG aimed at replacing older Boeing 757s, 767s and Airbus A320s. In addition, Delta has orders for 75 CS100 aircraft from Bombardier.

#### 2.4.2 Next Generation Aircraft Trends

The introduction of new aircraft technology will continue to be a key enabler of new nonstop services around the world, especially with respect to international services. Aircraft such as the next-generation Boeing 777s, the Boeing 787 and the Airbus A-350 incorporate new airframe, engine and wing designs for significant improvements in aircraft range and fuel efficiency. Entering commercial service in 2011, the Boeing 787 "Dreamliner" was the first commercial airliner made of lightweight composite carbon fiber material rather than aluminum, allowing fuel savings of approximately 20 percent compared to existing aircraft of similar size. Despite production delays and various initial in-service problems, the 787 has enjoyed a high degree of success becoming the fastest-selling airliner to date since launch. The Airbus 350, a long-range twin-engine jetliner made primarily of composite materials, is a rival to the 787 that entered commercial service in January 2015. These new fuel-efficient aircraft are allowing carriers to serve profitably long-haul routes that were previously uneconomical with the Boeing 777, Boeing 747, A340 and other older technology long-range aircraft.

As shown in Exhibit 2-11, there are over 580 Boeing 787 and Airbus 350 aircraft currently in service. More than 1,300 orders for these two aircraft have been placed by airlines worldwide<sup>20</sup>. By 2020, an additional 980 next generation aircraft are expected to be delivered including 494 787s and 486 A350s. Asia is the leading market for next generation wide-body aircraft deliveries, with Asian carriers accounting for close to 35.3 percent of 787 and A350 aircraft orders. Middle Eastern carriers follow with 20.9 percent of orders and European carriers with approximately 18 percent. Among U.S. carriers, United was the first carrier to operate the 787 commencing in 2014, followed by American, which received its first Boeing 787 in 2015. United, American and Delta each expect additional Boeing 787/A350 deliveries ranging from 25 to 52 aircraft through 2025.

**Exhibit 2-11: Worldwide Boeing 787 and Airbus 350 Current Fleet and Projected Aircraft Deliveries**



Note: As of March 2017, there are 78 Boeing 787 and Airbus 350 on order without a delivery date, which are not reflected in the figure above.  
 Source: CAPA Fleets, March 2017.

Use of new fuel-efficient aircraft will continue to allow airlines to open up new non-stop routes, introducing more service to markets that may lack significant feeder traffic from a hub carrier, such as Boston Logan Airport. Below, Exhibit 2-12 shows new (or regained) routes enabled by the B787.

<sup>20</sup> As of March 2017, there are 78 Boeing 787 and Airbus 350 on order without a delivery date, which are not included in the 1,300 orders.

**Exhibit 2-12: International Services Launched with Boeing 787 Aircraft from the U.S.**

Note: Includes new markets that have gained service due to the Boeing 787 economics, as well as markets that regained service due to the Boeing 787.  
Source: OAG, July 2017.

## 2.5 U.S. Airline Financial Performance

### 2.5.1 Revenues

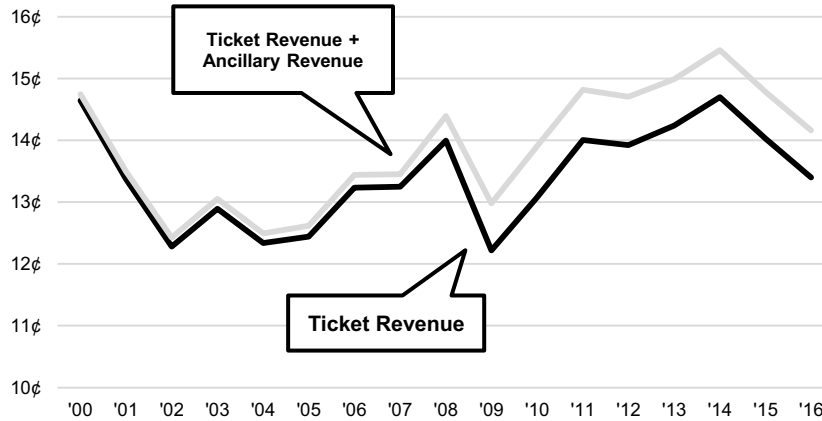
The average nominal domestic yield for the U.S. airline industry since 2000 is displayed in Exhibit 2-13. Domestic yields dropped sharply after 2000, but made a significant recovery starting in 2004 as airlines made efforts to capture additional revenue through various strategies such as yield management and product unbundling. Better yield management techniques allowed airlines to maximize revenue generation by filling their planes with as many high priced seats as possible. Carriers also began to offer a la carte pricing, maintaining a lower base fare, but introducing extra fees for services such as checked baggage and preferential seating. By 2008, average domestic yield reached 14.0 cents, almost returning to pre-9/11 levels. The global recession in 2008-2009 led to another sharp decline in yields, as passenger demand contracted across the industry. Airlines responded with better capacity management and the expanded use of ancillary fees. In 2014, average industry yield recovered to pre-9/11 levels, reaching 14.7 cents excluding ancillary fees and 15.4 cents including certain ancillary fees. Yields have declined since 2014, reaching 13.4 cents excluding fees and 14.2 cents including certain fees in 2016. The drop in yields over the past two years reflects lowered fares due to increased competition, especially expanded LCC and ULCC service, as well as factors such as the appreciation of the U.S. dollar and its impact on non-U.S. dollar revenues.

Revenue from baggage and other fees associated with ancillary products and services has become a key element in the airlines' ability to achieve top-line growth. Starting in 2008-2009, as many U.S. carriers introduced baggage fees for passengers' checked baggage, airline revenue generated by baggage fees have skyrocketed. Baggage fee revenue increased nearly seven-fold in the span of just three years, from \$357 million in 2007 to \$2.3 billion in 2009. In search of new revenue streams, airlines have continued to unbundle services since 2011, introducing charges for on-board food and beverages, seating with extra legroom, in-flight entertainment, priority boarding, the use of telephone reservation systems, and other services. Reported ancillary revenues currently account for an additional 5.7 percent of revenue on top of ticket revenues. However, as only certain ancillary fees are reported separately<sup>21</sup> in U.S. DOT data filings, this estimate of ancillary yield is actually most likely understated. Total ancillary revenues (including those

<sup>21</sup> Some fees are aggregated into "Miscellaneous Operating Revenues."

not reported separately to the U.S. DOT) collected by Major Carriers<sup>22</sup> in 2016 are estimated at \$20.2 billion, or close to 12 percent of total revenue.<sup>23</sup>

**Exhibit 2-13: Domestic Nominal Yields, Revenues per Revenue Passenger Mile (RPM)  
(CY 2000 to CY 2016)**



Note: Ancillary revenue in this graph includes baggage and reservations/change/cancellation fees but excludes fees for premium seating or boarding and other services as these fees are not explicitly shown in U.S. DOT Form 41 data;

All U.S. carriers required to report to Form 41 are shown on this graph.

Source: U.S. DOT, Form 41.

As shown in Exhibit 2-14, overall domestic yield, excluding fees, for network carriers and LCCs has decreased by 1.1 percent on average since 2012. The difference between network carrier and LCC domestic yields has widened over the past few years. Average domestic yield for LCCs saw a decrease of 7.6 percent from 13.9 cents in 2012 to 12.9 cents in 2016. Over the same period, average domestic yield for network carriers increased by 1.6 percent from 14.2 cents to 14.4 cents.

<sup>22</sup> Major Carriers defined by the U.S. DOT as those exceeding \$1 billion per year in revenue and include Allegiant Air, American, Alaska Airlines, Delta Air Lines, Frontier Airlines, Hawaiian Airlines, JetBlue, Southwest Airlines, Spirit Airlines, United Airlines and Virgin America.

<sup>23</sup> Idea Works/Cartrawler study (2016).

**Exhibit 2-14: Network Carrier and Low Cost Carrier Domestic Yields, Passenger Revenues per RPM (CY 2011 to CY 2016)**

Carrier	Domestic Yield					Pct. Change				
	2012	2013	2014	2015	2016	'12-'13	'13-'14	'14-'15	'15-'16	'12-'16
<b>Low Cost Carriers</b>										
Allegiant	10.1¢	10.1¢	10.3¢	9.3¢	8.4¢	0.3%	2.2%	-10.2%	-9.1%	-16.3%
Frontier	11.9¢	12.5¢	12.3¢	9.6¢	7.0¢	5.2%	-1.1%	-21.9%	-26.9%	-40.7%
JetBlue	13.3¢	13.5¢	14.1¢	14.2¢	13.3¢	1.5%	3.8%	1.2%	-6.3%	-0.2%
Southwest	15.1¢	16.2¢	16.5¢	15.7¢	15.1¢	6.9%	2.0%	-4.6%	-4.2%	-0.3%
Spirit	8.6¢	8.7¢	8.6¢	7.1¢	6.1¢	1.4%	-0.9%	-18.2%	-13.2%	-28.6%
Sun Country	13.7¢	14.6¢	13.9¢	11.9¢	10.9¢	6.9%	-5.1%	-14.0%	-8.4%	-20.1%
Virgin America	12.4¢	13.1¢	13.0¢	12.8¢	11.9¢	5.7%	-1.0%	-1.2%	-7.2%	-4.0%
<b>Average Yield</b>	<b>13.9¢</b>	<b>14.6¢</b>	<b>14.8¢</b>	<b>13.9¢</b>	<b>12.9¢</b>	<b>4.9%</b>	<b>1.3%</b>	<b>-6.0%</b>	<b>-7.4%</b>	<b>-7.6%</b>
<b>Network Carriers</b>										
Alaska	13.6¢	13.5¢	13.8¢	13.1¢	12.3¢	-0.4%	1.7%	-4.5%	-6.6%	-9.6%
American	14.5¢	14.8¢	15.6¢	14.9¢	14.6¢	2.0%	5.2%	-4.0%	-2.1%	0.7%
Delta	14.7¢	15.7¢	16.5¢	16.4¢	15.7¢	6.9%	5.3%	-0.8%	-4.6%	6.6%
Hawaiian	14.4¢	14.9¢	15.7¢	15.2¢	15.2¢	3.4%	4.9%	-2.9%	0.2%	5.5%
United	13.5¢	13.5¢	14.2¢	13.9¢	13.4¢	0.7%	4.5%	-2.2%	-3.5%	-0.6%
<b>Average Yield</b>	<b>14.2¢</b>	<b>14.6¢</b>	<b>15.3¢</b>	<b>15.0¢</b>	<b>14.4¢</b>	<b>3.0%</b>	<b>4.9%</b>	<b>-2.5%</b>	<b>-3.5%</b>	<b>1.6%</b>
<b>Total/Average</b>	<b>14.1¢</b>	<b>14.6¢</b>	<b>15.2¢</b>	<b>14.6¢</b>	<b>13.9¢</b>	<b>3.6%</b>	<b>3.7%</b>	<b>-3.8%</b>	<b>-5.0%</b>	<b>-1.7%</b>

Note: Yield based on passenger ticket revenues only. Excludes ancillary revenue.  
Source: U.S. DOT Form 41.

### 2.5.2 Costs

Nominal unit operating costs for scheduled U.S. carriers are presented in Exhibit 2-15. Airline costs saw a sharp increase from 2003 to 2008, largely driven by increases in fuel prices. Despite efforts by airlines – both network and LCCs – to reduce costs in areas such as labor, aircraft ownership, maintenance, distribution and other support activities, rising fuel prices continued to push total operating costs higher. Average unit costs rose from approximately 12.8 cents per available seat mile (“ASM”) in the third quarter of 2003 to a peak of 19.1 cents at the height of the fuel spike in 2008. After falling to 15.2 cents per ASM in 2Q 2009, average units costs generally trended up again through the first half of 2014, driven by high and volatile fuel prices. A sharp decline in oil prices starting in the second half of 2014 led to a significant drop in unit costs in recent quarters. Average unit costs for U.S. carriers increased from 16.1 cents per ASM in 4Q 2015 to 17.5 cents in 4Q 2016.

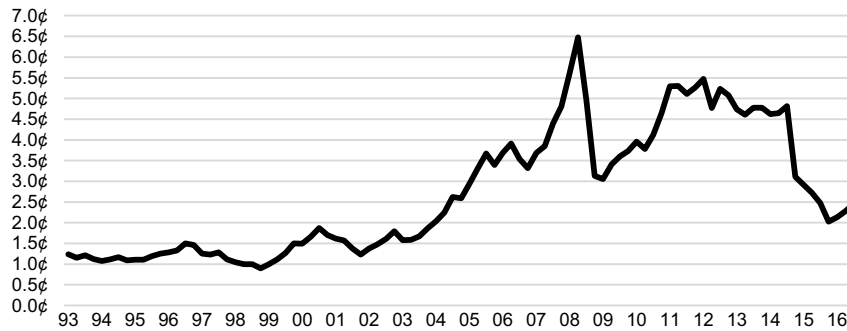
**Exhibit 2-15: U.S. Scheduled Carrier Nominal Operating Costs per ASM (CY 2000 to CY 2016)**



Source: U.S. DOT Form 41.

Fuel cost per ASM more than tripled between 2000 and 2014, rising from approximately 1.6 cents to 4.7 cents per ASM during 2014 (Exhibit 2-16). In 2008, a spike in crude oil prices drove up jet fuel prices to an unprecedented 6.5 cents per ASM in 3Q 2008. Fuel cost per ASM rose again sharply between 2009 and 2014, in part due to unrest in the Middle East, and remained high though volatile through most of 2014. Starting in the second half of 2014, oil prices began to decline sharply, falling from \$106 per barrel in June 2014 to \$54 per barrel at the end of 2016. The drop in oil prices is linked to the rapid increase in domestic oil production in the United States in recent years, resulting in a reduction in American imports and a glut on world markets. Fuel cost per ASM dropped to 2.5 cents per ASM in 4Q 2016 and will remain low until oil prices begin to increase again.

**Exhibit 2-16: U.S. Scheduled Carrier Nominal Fuel Cost Per ASM  
(CY 2000 to CY 2016)**

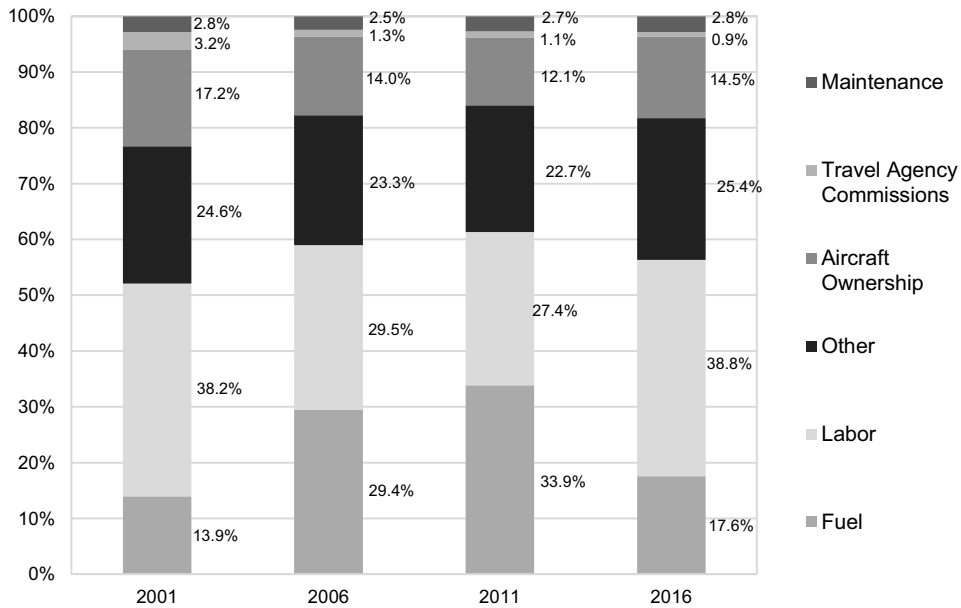


Source: U.S. DOT Form 41.

Below, Exhibit 2-17 presents U.S. carrier operating expenses by category since 2001. Fuel, as a percentage of total operating costs, climbed from 14 percent in 2001 to a peak of 33.9 percent in 2011. The recent drop in oil prices resulted in a substantial decrease in fuel costs, which have now declined to 17.6 percent of operating expense in CY 2016. Fuel price volatility presents an ongoing challenge for airlines, with changes in fuel price having significant potential impact on airline profitability. Airlines were able to reduce labor costs as a percentage of total costs from 38.2 percent in 2001 to 27.4 percent in 2011. As fuel costs have declined, labor now once again represents the largest component of operating costs at 38.8 percent of total costs in CY 2016. Aircraft ownership currently represents 14.5 percent of total costs, while other expenses represent 25.4 percent. Airport usage costs continue to represent a small percentage of airline costs (e.g., landing fees are 2.4 percent of total operating costs).<sup>24</sup>

<sup>24</sup> U.S. DOT Form 41 Database.

**Exhibit 2-17: U.S. Scheduled Carrier Share of Operating Expenses by Category (2001 to 2016)**

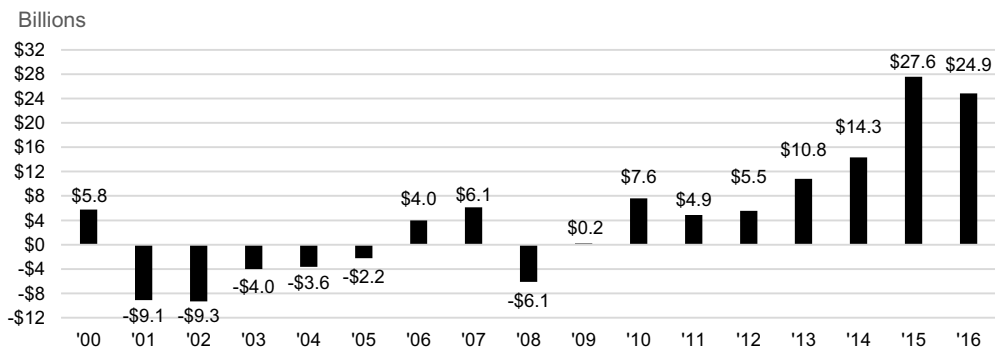


Note: Excludes fees paid to regional carrier affiliates for operating codeshare flights.  
 Source: U.S. DOT Form 41.

**2.5.3 U.S. Airline Profitability**

The U.S. airline industry recovered from steep losses experienced during 2008 and has consistently achieved profits since 2010 (see Exhibit 2-16). In 2008, the sharp rise in fuel prices coupled with a worldwide recession drove operating costs higher while demand softened. Industry losses in 2008 reached \$6.3 billion. Carriers employed fuel hedging strategies extensively in an attempt to offset high fuel costs. While this provided some cushion, hedges also resulted in losses for some airlines due to the extreme volatility in oil prices. Airlines were forced to reduce losses by sharply curtailing capacity and controlling costs. Despite the lack of a robust economic recovery, the U.S. airline industry regained profitability. Helped by the continued drop of oil prices, U.S. airline operating income was \$24.9 billion in CY 2016.

**Exhibit 2-18: Operating Income of U.S. Scheduled Airlines, in \$ Billions (CY 2000 to CY 2016)**



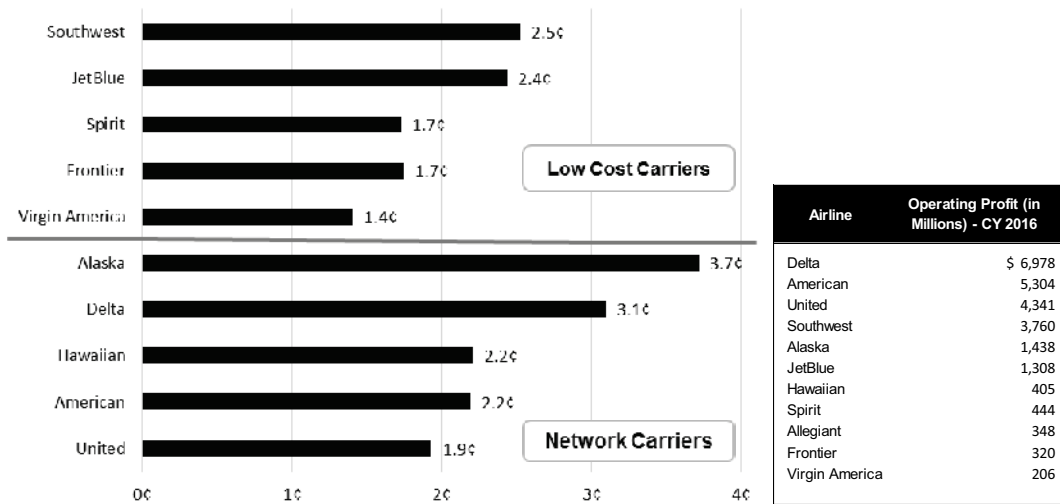
Note: Includes major U.S. passenger airlines (Allegiant, American, Alaska Airlines, Delta, Frontier, Hawaiian, JetBlue, Southwest, Spirit, United, and Virgin America).  
 Source: U.S. DOT Form 41 Database.

All major U.S. carriers were profitable in CY 2016 (Exhibit 2-19). Delta Air Lines was the industry leader, posting an operating profit of approximately \$7.0 billion in CY 2016. American was second, seeing an operating profit of approximately \$5.3 billion. United posted profits in excess of \$4.3 billion. The largest of the LCCs, Southwest and JetBlue, achieved operating profits of \$3.8 billion and \$1.3 billion, respectively.



Of U.S. major carriers, Alaska and Delta saw the highest profit per available seat mile for full service carriers in CY 2016, at 3.7 and 3.1 cents respectively, while United was last, at 1.9 cents. For low cost carriers, Southwest had the highest margin, at 2.5 cents profit per available seat mile while Virgin America had the lowest margin at 1.4 cents.

**Exhibit 2-19: Profit per Available Seat Mile for U.S. Airlines (CY 2016)**



Note: Includes major U.S. passenger airlines as defined by the U.S. DOT, excluding regional affiliates.  
 Source: U. S. DOT Form 41 Database.

Overall, a tiered cost structure separation of the industry remains, with the LCCs displaying both lower yields and lower unit costs than the network carriers. Average unit revenues (RASM) and average unit costs (CASM) for network carriers and LCCs are shown in Exhibit 2-20. In CY 2016, network carriers reported an average unit cost of 14.2 cents and an average unit revenue of 16.7 cents, while LCCs reported an average unit cost of 10.1 cents and an average unit revenue of 12.5 cents. While the LCCs enjoy a lower cost structure, they also generate less revenue due to lower fares; high unit costs for network carriers are coupled with higher fares.

**Exhibit 2-20: Cost per Available Seat Mile (CASM) and Revenue per Available Seat Mile (RASM) for Network and Low Cost Carriers (CY 2016)**

Carrier	CY 2016			CY 2016			
	RASM	CASM	Diff.	RASM	CASM	Diff.	
<b>Network Carriers</b>				<b>Low Cost Carriers</b>			
Alaska	15.1¢	11.3¢	3.7¢	Allegiant	10.9¢	8.0¢	2.9¢
American	16.7¢	14.5¢	2.2¢	Frontier	9.3¢	7.6¢	1.7¢
Delta	17.7¢	14.6¢	3.1¢	JetBlue	12.3¢	9.9¢	2.4¢
Hawaiian	13.3¢	11.1¢	2.2¢	Southwest	13.7¢	11.2¢	2.5¢
United	16.3¢	14.3¢	1.9¢	Spirit	9.1¢	7.3¢	1.7¢
				Sun Country	10.9¢	10.6¢	0.3¢
				Virgin America	11.4¢	10.0¢	1.4¢
<b>Average</b>	<b>16.7¢</b>	<b>14.2¢</b>	<b>2.5¢</b>	<b>Average</b>	<b>12.5¢</b>	<b>10.1¢</b>	<b>2.4¢</b>
				<b>Total/Average</b>	<b>15.8¢</b>	<b>13.4¢</b>	<b>2.4¢</b>

Source: U.S. DOT Form 41.

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### 3. ECONOMIC CHARACTERISTICS OF THE BOSTON LOGAN SERVICE AREA

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#### 3.1 Introduction

Air travel demand and airport passenger traffic are strongly linked to the economic characteristics of a region. The Boston service area, encompassing the Greater Boston Metropolitan Area, is a central player in the nation's finance, technology, biotechnology, healthcare and education sectors. As one of the nation's largest population and economic centers, Boston is a mature market with a high per capita income of \$57,296 (2015),<sup>25</sup> which is 30.4 percent above the U.S. average, and an unemployment rate well below the national average. Such favorable economic conditions contribute to the region's sustained demand for air travel.

Following the economic downturn of 2008-2009, the Massachusetts economy has recovered and maintained steady, positive growth in recent years. The Boston metropolitan area ranks ninth among U.S. metropolitan areas in terms of economic output, with economic growth between 2010 and 2015 tracking closely to national average.<sup>26</sup> The resilience of the Boston economy is partially attributed to the area's diversified economic base, which is spread across science and knowledge-based sectors, including information technology, biotechnology, healthcare, education, and medical scientific research and products. These industries are highly travel dependent, boosting the O&D market. Massachusetts has benefitted from improving economic conditions in the U.S. and has been further buoyed by its strong reliance on the growing technology sector. In 2016, according to MassBenchmarks, economic growth in the Commonwealth<sup>27</sup> has continued to keep pace with the nation's economic growth.

Forecasts for near-term economic growth in the Commonwealth indicate that economic output is expected to remain steady in 2017, despite global uncertainty.<sup>28</sup> Growth is expected to be driven by the strong technology sector and falling unemployment. As of March 2017, the Commonwealth's unemployment rate of 3.6 percent remained lower than the national rate of 4.5 percent reported by the Bureau of Labor Statistics.<sup>29</sup> Personal income for the Commonwealth and the Boston service area is forecast to grow by 2.0 percent annually over the long-term (2015-2030).<sup>30</sup> These projections of economic activity suggest that air travel demand in the region will continue to grow over the long-term.

This section of the report covers various economic indicators for Massachusetts and the metro Boston region and the outlook for long-term demographic and economic growth.

#### 3.2 Review of Massachusetts Economic Trends

##### 3.2.1 *Economic Output*

Exhibit 3-1 shows historical year-over-year GDP growth for Massachusetts and the U.S. through 2015, as well as 2016 quarterly growth rates through 3Q 2016. Similar to the rest of the nation, the Massachusetts economy was seriously affected by the U.S. subprime mortgage crisis and economic recession in 2008-2009, but rebounded in 2010. Massachusetts recovered at a slightly faster pace than the rest of the country, with Massachusetts GDP growth surpassing national GDP growth in 2010 and 2011. After a period of contraction in 2013, Massachusetts GDP growth picked up, increasing by 1.2 percent in 2014 and 3.8 percent in 2015. The first three quarters of 2016<sup>31</sup> indicate that quarterly GDP growth in the Commonwealth averaged 0.7% quarter on quarter, while the nation experienced average growth of 0.6% quarter on quarter over the same period.

Over the past 20 years, Massachusetts GDP as a percentage of U.S. GDP has ranged between 2.6 percent and 2.8 percent. Considering its population base, the Commonwealth contributes disproportionately to national economic output. In 2016, Massachusetts accounted for approximately 2.7 percent of U.S. GDP, though only accounting for 1.8 percent of total U.S. population.

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<sup>25</sup> Woods & Poole Economics. Latest actual data is 2015.

<sup>26</sup> Bureau of Economic Analysis.

<sup>27</sup> Massachusetts is officially called the Commonwealth of Massachusetts

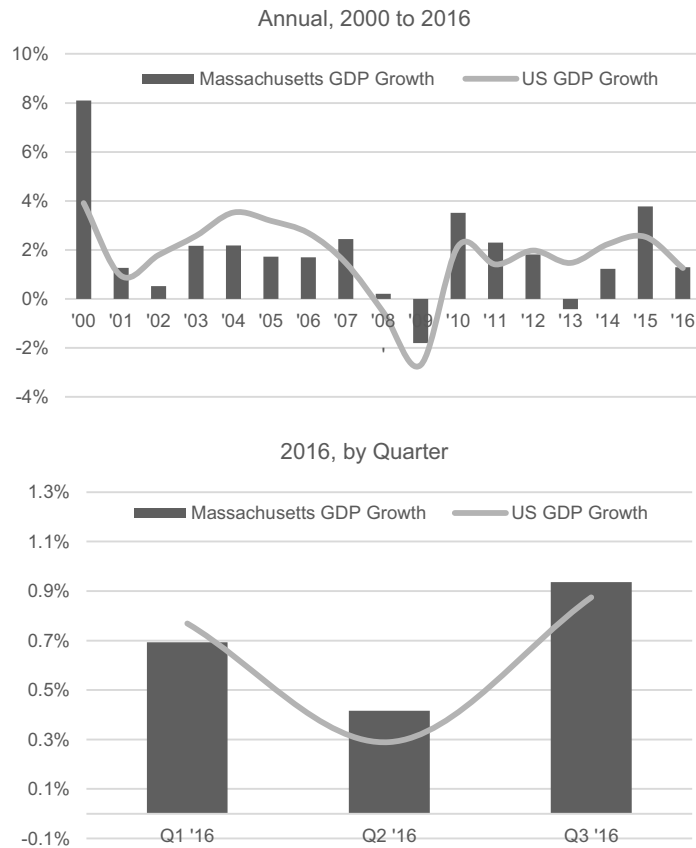
<sup>28</sup> MassBenchmarks, "Economic Growth in Mass", March 2016

<sup>29</sup> Bureau of Labor Statistics.

<sup>30</sup> Woods & Poole Economics. Latest actual data is 2015.

<sup>31</sup> Full calendar year data for 2016 has not yet been released.

**Exhibit 3-1: Annual Growth in Massachusetts GDP and U.S. GDP (2000-2016)**



Note: 2016 figures for Massachusetts reflect U.S. Bureau of Economic Analysis preliminary estimates for year to date 3Q 2016; full 2016 calendar year data for Massachusetts has not yet been released.  
 Source: U.S. Department of Commerce, Bureau of Economic Analysis (BEA)

### 3.2.2 Employment

The Boston area maintains one of the largest employee bases in the nation, as shown in Exhibit 3-2. Boston is ranked 9<sup>th</sup> in the nation with over 2.7 million employees as of March 2017, compared to a population rank of 10<sup>th</sup>.<sup>32</sup> Showing signs of improving growth, Boston area employment is up 1.6 percent from March 2016, compared to a 2.3 percent increase over the same time period from 2015 to 2016.

<sup>32</sup> Boston is based on Metropolitan Statistical Areas for United States, which includes Boston-Cambridge-Nashua, MA-NH

**Exhibit 3-2: Non-Agricultural Employment for Major Metropolitan Areas and Total U.S.  
(March 2016 to March 2017)**

Metropolitan Area	Employee	Non-Farm Employees (000)		Net	Pct	Rank by
	Rank	Mar 2017 (p)	Mar 2016	Change	Change	Percent Change
New York-Newark-Jersey City	1	9,514.2	9,406.0	108.2	1.2%	13
Los Angeles-Long Beach-Anaheim	2	6,028.5	5,920.9	107.6	1.8%	10
Chicago-Naperville-Elgin	3	4,611.6	4,577.2	34.4	0.8%	15
Dallas-Fort Worth-Arlington	4	3,584.9	3,455.2	129.7	3.8%	2
Washington-Arlington-Alexandria	5	3,245.0	3,194.5	50.5	1.6%	12
Houston-The Woodlands-Sugar Land	6	3,023.4	2,992.5	30.9	1.0%	14
Philadelphia-Camden-Wilmington	7	2,891.5	2,834.5	57.0	2.0%	9
Atlanta-Sandy Springs-Roswell	8	2,726.0	2,622.9	103.1	3.9%	1
<b>Boston-Cambridge-Nashua</b>	<b>9</b>	<b>2,703.5</b>	<b>2,661.3</b>	<b>42.2</b>	<b>1.6%</b>	<b>11</b>
Miami-Fort Lauderdale-West Palm Beach	10	2,643.9	2,578.5	65.4	2.5%	6
San Francisco-Oakland-Hayward	11	2,373.2	2,310.2	63.0	2.7%	4
Phoenix-Mesa-Scottsdale	12	2,020.9	1,967.5	53.4	2.7%	5
Seattle-Tacoma-Bellevue	13	1,980.5	1,919.3	61.2	3.2%	3
Detroit-Warren-Dearborn	14	1,979.9	1,939.7	40.2	2.1%	8
Minneapolis-St. Paul-Bloomington	15	1,954.9	1,915.1	39.8	2.1%	7
<b>Sub Total:</b>		<b>51,281.9</b>	<b>50,295.3</b>	<b>986.6</b>	<b>2.0%</b>	
Rest Of U.S.		93,671.1	92,518.7	1,152.4	1.2%	
<b>Total U.S.</b>		<b>144,953.0</b>	<b>142,814.0</b>	<b>2,139.0</b>	<b>1.5%</b>	

NOTE: Data are counts of jobs by place of work. Estimates subsequent to the current benchmark are preliminary and will be revised when new information becomes available. Area delineations are based on Office of Management and Budget Bulletin No. 13-01, dated February 28, 2013, and are available on the BLS website at [www.bls.gov/lau/lausmsa.htm](http://www.bls.gov/lau/lausmsa.htm). Areas in the six New England states are Metropolitan New England City and Town Areas (NECTAs), while areas in other states are county-based. Some metropolitan areas lie in two or more states. They are listed under the state containing the first principal city, unless otherwise footnoted. Estimates for the latest month are subject to revision the following month. Principal cities in the Boston-Cambridge-Nashua, MA-NH Metropolitan NECTA include Boston, MA, Cambridge, MA, Nashua, NH, Newton, MA, Framingham, MA, and Waltham, MA. Not seasonally adjusted.

\* Area boundaries do not reflect official OMB definitions.  
(p) Preliminary figures.

Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS).

The leading industries for employment (accounting for approximately half of non-farm employees) in Boston<sup>33</sup> and Massachusetts are Education and Health Services; Trade, Transportation, and Utilities; and Professional and Business Services. As reflected in Exhibit 3-3, preliminary figures for March 2017 show that Education and Health Care Services account for 21.8 percent of Boston's non-farm employees; Professional and Business Services account for 17.3 percent; and Trade, Transportation and Utilities represent approximately 15.4 percent of non-farm employees in Boston.

<sup>33</sup> Population ranking for Boston is based on Metropolitan Statistical Areas for United States, which includes Boston-Cambridge-Nashua, MA-NH

**Exhibit 3-3: Non-Agricultural Employment by Industry Sector for Boston<sup>34</sup>, Massachusetts and the U.S. (March 2016 to March 2017)**

Industry Sector	March 2017 Non-Farm Employees (000)			March 2016 Non-Farm Employees (000)			Percent Change from Prior Year		
	US	MA	BOS*	US	MA	BOS*	US	MA	BOS
Education & Health Services	22,966.0	796.3	589.5	22,443.0	777.3	571.8	2.3%	2.4%	3.1%
Trade, Transportation, & Utilities	27,371.0	577.1	416.0	27,167.0	574.7	414.4	0.8%	0.4%	0.4%
Professional & Business Services	20,567.0	558.0	468.8	19,928.0	545.7	455.8	3.2%	2.3%	2.9%
Government	22,323.0	459.7	322.7	22,166.0	456.7	319.4	0.7%	0.7%	1.0%
Leisure & Hospitality	15,801.0	362.8	252.6	15,537.0	359.3	251.4	1.7%	1.0%	0.5%
Manufacturing	12,390.0	243.7	184.9	12,355.0	246.7	187.0	0.3%	-1.2%	-1.1%
Financial Activities	8,403.0	229.4	189.2	8,231.0	223.1	183.7	2.1%	2.8%	3.0%
Other Services	5,723.0	137.1	100.9	5,670.0	136.0	99.5	0.9%	0.8%	1.4%
Construction	6,872.0	150.4	100.1	6,705.0	146.2	101.0	2.5%	2.9%	-0.9%
Information	2,742.0	90.2	78.4	2,779.0	89.1	77.3	-1.3%	1.2%	1.4%
Natural Resources & Mining	694.0	1.1		692.0	1.1		0.3%	0.0%	n/a
<b>Total</b>	<b>145,852.0</b>	<b>3,605.8</b>	<b>2,703.1</b>	<b>143,673.0</b>	<b>3,555.9</b>	<b>2,661.3</b>	<b>1.5%</b>	<b>1.4%</b>	<b>1.6%</b>
<b>Percent of Total</b>							<b>MA More/Less than US</b>		
Education & Health Services	15.7%	22.1%	21.8%	15.6%	21.9%	21.5%		6.3%	
Trade, Transportation, & Utilities	18.8%	16.0%	15.4%	18.9%	16.2%	15.6%		-2.8%	
Professional & Business Services	14.1%	15.5%	17.3%	13.9%	15.3%	17.1%		1.4%	
Government	15.3%	12.7%	11.9%	15.4%	12.8%	12.0%		-2.6%	
Leisure & Hospitality	10.8%	10.1%	9.3%	10.8%	10.1%	9.4%		-0.8%	
Manufacturing	8.5%	6.8%	6.8%	8.6%	6.9%	7.0%		-1.7%	
Financial Activities	5.8%	6.4%	7.0%	5.7%	6.3%	6.9%		0.6%	
Other Services	3.9%	3.8%	3.7%	3.9%	3.8%	3.7%		-0.1%	
Construction	4.7%	4.2%	3.7%	4.7%	4.1%	3.8%		-0.5%	
Information	1.9%	2.5%	2.9%	1.9%	2.5%	2.9%		0.6%	
Natural Resources & Mining	0.5%	0.0%	0.0%	0.5%	0.0%	0.0%		-0.4%	
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>			

\*Areas in the six New England states are Metropolitan New England City and Town Areas (NECTAs); Principal cities in the Boston-Cambridge-Nashua, MA-NH Metropolitan NECTA include Boston, MA, Cambridge, MA, Nashua, NH, Newton, MA, Framingham, MA and Waltham, MA; Not seasonally adjusted; Boston's natural resources & mining is included under Construction

Note: U.S. non-farm employment data are preliminary; U.S. and MA non-farm employees' statistics are seasonally adjusted.

Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS).

Since 2001, employment in the Education and Health Services sector has increased the fastest, while the Manufacturing sector showed the largest decline (Exhibit 3-4). Education and Health Services increased from 16.3 percent to 21.8 percent of the Boston-Cambridge-Nashua, MA-NH Metropolitan area non-agricultural employment from 2001 to 2017. Manufacturing decreased from 11.8 percent of non-agricultural employment in 2001 to 6.8 percent in 2017.

<sup>34</sup> Boston is based on Metropolitan Statistical Areas for United States, which includes Boston-Cambridge-Nashua, MA-NH

**Exhibit 3-4: Non-Agricultural Employment by Industry Sector for Boston<sup>35</sup>**  
**(March 2001 to March 2017)**

Industry Sector	Non-Farm Employees (000)			Percent Change			Net Change (000s)		
	2001	2011	2017	01-11	11-17	01-17	01-11	11-17	01-17
Education & Health Services	410.3	513.4	589.5	2.3%	2.3%	2.3%	103.1	76.1	179.2
Trade, Transportation, & Utilities	438.4	390.6	416.0	-1.1%	1.1%	-0.3%	(47.8)	25.4	(22.4)
Professional & Business Services	412.1	393.1	468.8	-0.5%	3.0%	0.8%	(19.0)	75.7	56.7
Government	305.4	307.5	322.7	0.1%	0.8%	0.3%	2.1	15.2	17.3
Leisure & Hospitality	189.7	213.2	252.6	1.2%	2.9%	1.8%	23.5	39.4	62.9
Manufacturing	297.3	192.8	184.9	-4.2%	-0.7%	-2.9%	(104.5)	(7.9)	(112.4)
Financial Activities	193.3	174.6	189.2	-1.0%	1.3%	-0.1%	(18.7)	14.6	(4.1)
Other Services	85.1	93.5	100.9	0.9%	1.3%	1.1%	8.4	7.4	15.8
Mining, Logging, and Construction	95.2	70.6	100.1	-2.9%	6.0%	0.3%	(24.6)	29.5	4.9
Information	96.1	71.7	78.4	-2.9%	1.5%	-1.3%	(24.4)	6.7	(17.7)
<b>Total</b>	<b>2,522.9</b>	<b>2,421.0</b>	<b>2,703.1</b>	<b>-0.4%</b>	<b>1.9%</b>	<b>0.4%</b>	<b>(101.9)</b>	<b>282.1</b>	<b>180.2</b>
<b>Percent of Total</b>									
Education & Health Services	16.3%	21.2%	21.8%	2.6%	0.2%	1.7%			
Trade, Transportation, & Utilities	17.4%	16.1%	15.4%	-0.9%	-0.6%	-0.8%			
Professional & Business Services	16.3%	16.2%	17.3%	0.0%	1.0%	0.4%			
Government	12.1%	12.7%	11.9%	0.5%	-1.2%	-0.1%			
Leisure & Hospitality	7.5%	8.8%	9.3%	1.4%	1.5%	1.5%			
Manufacturing	11.8%	8.0%	6.8%	-3.9%	-2.1%	-3.2%			
Financial Activities	7.7%	7.2%	7.0%	-0.4%	-1.0%	-0.6%			
Other Services	3.4%	3.9%	3.7%	1.0%	0.0%	0.7%			
Construction	3.8%	2.9%	3.7%	-2.0%	4.5%	0.4%			
Information	3.8%	3.0%	2.9%	-1.6%	-0.8%	-1.3%			
<b>Total</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>						

Note: Areas in the six New England states are Metropolitan New England City and Town Areas (NECTAs); Principal cities in the Boston-Cambridge-Nashua, MA-NH Metropolitan NECTA include Boston, MA, Cambridge, MA, Quincy, MA, Nashua, NH, Newton, MA, Framingham, MA, Waltham, MA and Peabody, MA.; Not seasonally adjusted  
Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS).

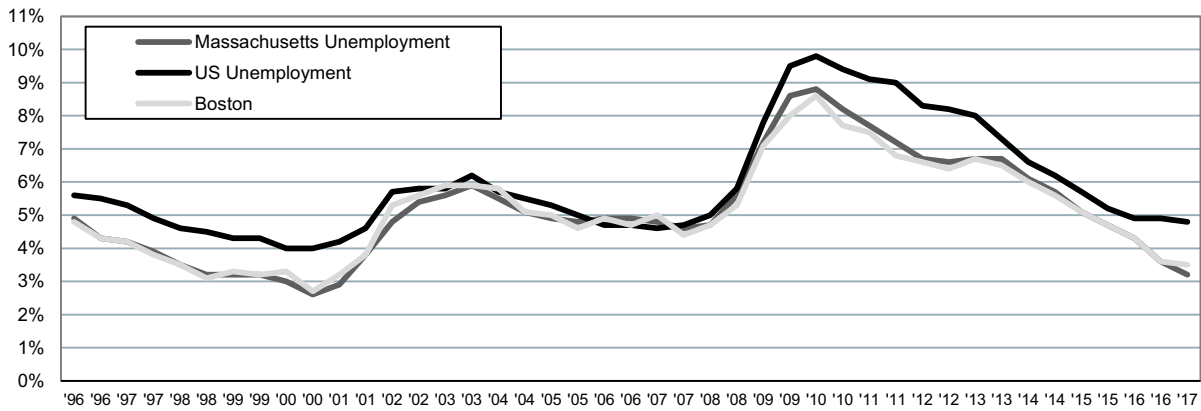
For most of the past two decades, unemployment rates in Massachusetts and the Boston-Cambridge-Nashua, MA-NH Metropolitan area have been below the national rate (Exhibit 3-5). The financial crisis that began in 2008 sent unemployment rates soaring across the United States. The national unemployment rate increased from 4.7 percent in 2007 to over nine percent from 2009-2011, peaking at 9.8 percent in January 2010.<sup>36</sup> Over the same period, Boston's unemployment rate was consistently below the state and national average, with a peak of 8.6 percent in

<sup>35</sup> Boston is based on Metropolitan Statistical Areas for United States, which includes Boston-Cambridge-Nashua, MA-NH

<sup>36</sup> U.S. Department of Commerce, Bureau of Labor Statistics.

January 2010. As the economy has recovered, national unemployment has declined since its 2010 peak. As of March 2017, the national unemployment rate stood at 4.5 percent while Boston's unemployment rate was 3.4 percent.

**Exhibit 3-5: Unemployment Rates for Boston, Massachusetts and the U.S. (January and July, 1992 to 2017)**



Note: The unemployment rate for Massachusetts is a preliminary figure as released by BLS of March 2017.  
 Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS).

As of March 2017, the Boston area's unemployment rate ranked the 3<sup>rd</sup> lowest among the nation's large metropolitan areas (Exhibit 3-6). The unemployment rate for the Boston metropolitan area as of March 2017 was 3.4 percent, down from 3.8 percent in March 2016. Boston's unemployment rate has declined considerably, in part due to the expanding technology sector.

**Exhibit 3-6: Large Metropolitan Areas with Unemployment Below 5%**  
**(March 2017 Rankings)**

Rank	Metropolitan Area	Mar. 2017 (p) Unemployment Rate
<b>Under 5.0% Unemployment</b>		
1	Denver-Aurora-Lakewood, CO Metropolitan Statistical Area	2.4
2	Salt Lake City, UT Metropolitan Statistical Area	3.2
<b>3</b>	<b>Boston-Cambridge-Nashua, MA-NH Metropolitan NECTA</b>	<b>3.4</b>
4	Indianapolis-Carmel-Anderson, IN Metropolitan Statistical Area	3.5
4	San Francisco-Oakland-Hayward, CA Metropolitan Statistical Area	3.5
6	Austin-Round Rock, TX Metropolitan Statistical Area	3.6
6	Nashville-Davidson--Murfreesboro--Franklin, TN Metropolitan Statistical Area	3.6
6	San Jose-Sunnyvale-Santa Clara, CA Metropolitan Statistical Area	3.6
9	Milwaukee-Waukesha-West Allis, WI Metropolitan Statistical Area	3.7
9	Seattle-Tacoma-Bellevue, WA Metropolitan Statistical Area	3.7
9	Washington-Arlington-Alexandria, DC-VA-MD-WV Metropolitan Statistical Area	3.7
12	Minneapolis-St. Paul-Bloomington, MN-WI Metropolitan Statistical Area	3.8
12	Oklahoma City, OK Metropolitan Statistical Area	3.8
14	Orlando-Kissimmee-Sanford, FL Metropolitan Statistical Area	3.9
14	Portland-Vancouver-Hillsboro, OR-WA Metropolitan Statistical Area	3.9
14	Richmond, VA Metropolitan Statistical Area	3.9
17	Columbus, OH Metropolitan Statistical Area	4.0
17	St. Louis, MO-IL Metropolitan Statistical Area(1)	4.0
19	Jacksonville, FL Metropolitan Statistical Area	4.1
19	New York-Newark-Jersey City, NY-NJ-PA Metropolitan Statistical Area	4.1
19	Phoenix-Mesa-Scottsdale, AZ Metropolitan Statistical Area	4.1
19	Raleigh, NC Metropolitan Statistical Area	4.1
19	San Antonio-New Braunfels, TX Metropolitan Statistical Area	4.1
19	Tampa-St. Petersburg-Clearwater, FL Metropolitan Statistical Area	4.1
25	Cincinnati, OH-KY-IN Metropolitan Statistical Area	4.2
25	Kansas City, MO-KS Metropolitan Statistical Area	4.2
25	Los Angeles-Long Beach-Anaheim, CA Metropolitan Statistical Area	4.2
25	San Diego-Carlsbad, CA Metropolitan Statistical Area	4.2
25	Virginia Beach-Norfolk-Newport News, VA-NC Metropolitan Statistical Area	4.2
30	Dallas-Fort Worth-Arlington, TX Metropolitan Statistical Area	4.3
31	Charlotte-Concord-Gastonia, NC-SC Metropolitan Statistical Area	4.4
31	Louisville/Jefferson County, KY-IN Metropolitan Statistical Area	4.4
33	Baltimore-Columbia-Towson, MD Metropolitan Statistical Area	4.5
33	Chicago-Naperville-Elgin, IL-IN-WI Metropolitan Statistical Area	4.5
35	Atlanta-Sandy Springs-Roswell, GA Metropolitan Statistical Area	4.6
35	Miami-Fort Lauderdale-West Palm Beach, FL Metropolitan Statistical Area	4.6
35	Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metropolitan Statistical Area	4.6
38	Las Vegas-Henderson-Paradise, NV Metropolitan Statistical Area	4.8
38	Providence-Warwick, RI-MA Metropolitan NECTA	4.8
38	Rochester, NY Metropolitan Statistical Area	4.8
41	New Orleans-Metairie, LA Metropolitan Statistical Area	4.9

NOTE: Rates shown are a percentage of the labor force. Data refer to place of residence. Estimates for the current month are subject to revision the following month.  
Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS).



### 3.2.2.1 Employers

As shown in Exhibit 3-7, 13 Fortune 500 companies are headquartered in Massachusetts. In 2016, revenues for the Massachusetts-based Fortune 500 firms ranged from \$7.5 billion (Boston Scientific) to \$140.4 billion (General Electric). These companies span different industry sectors including insurance, aerospace, finance, technology and pharmaceuticals. The same 12 companies, plus the newly arrived General Electric, appeared on the 2015 list, indicating a steady business base in Massachusetts.

In the summer of 2016, General Electric (“GE”) officially opened its headquarters in downtown Boston. The relocation of GE’s headquarters from suburban Connecticut to Boston is taking place in gradual steps and is expected to be completed in calendar year 2018. With close to \$140.4 billion a year in revenue, GE currently ranks 11<sup>th</sup> on the Fortune 500 and is the largest publicly traded company based in Massachusetts. The company already employs nearly 5,000 people in the Commonwealth and is expected to add an additional 200 corporate and 600 tech-oriented jobs (e.g., designers, programmers) with the headquarters relocation.<sup>37</sup> In addition to the new direct jobs created, GE is also expected to be a major draw for other technology companies, especially those that specialize in software.

**Exhibit 3-7: Massachusetts Fortune 500 Companies  
(Ranked by 2016 Revenue)**

2016 MA	2016 Nation	2015 Nation	2014 Nation	Company (Location)	Industry	2016 Rev. (\$ Billions)	Employees (thousands)
1	11	8	9	General Electric (Boston)	Industrial Machinery	\$140.4	295.0
2	73	78	76	Liberty Mutual Insurance Group (Boston)	Insurance: Property and Casualty (stock)	\$39.5	45.6
3	76	94	96	Mass.Mutual Life Insurance (Springfield)	Insurance: Life, Health (mutual)	\$38.2	12.0
4	89	103	108	TJX (Framingham)	Specialty Retailers: Apparel	\$30.9	216.0
5	113	121	128	EMC (Hopkinton)	Computer Peripherals	\$24.7	72.0
6	120	129	126	Raytheon (Waltham)	Aerospace and Defense	\$23.2	63.0
7	132	133	127	Staples (Framingham)	Specialty Retailers: Other	\$21.1	46.4
8	164	181	215	Thermo Fisher Scientific (Waltham)	Scientific, Photographic, and Control Equip.	\$17.0	55.0
9	263	298	375	Biogen Idec (Weston)	Pharmaceuticals	\$10.8	7.4
10	264	278	275	State Street Corp. (Boston)	Commercial Banks	\$10.8	33.8
11	276	180	146	Global Partners (Waltham)	Wholesalers: Diversified	\$10.3	1.9
12	343	367	359	Eversource Energy (Springfield)	Utilities: Gas and Electric	\$8.0	7.8
13	359	378	367	Boston Scientific (Natick)	Medical Products and Equipment	\$7.5	27.0

Note: The Fortune 500 excludes private companies that do not file financial statements with a government agency; companies incorporated outside the U.S.; and U.S. companies owned or controlled by other companies, domestic or foreign, that file with a government agency. Employees are global figures.  
Source: Boston Business Journal and company websites.

### 3.2.2.2 Leading Massachusetts Industries

Six major industries have posted large contributions to the Boston region’s economy since the early 1990s and currently account for approximately one half of the Boston area employment base.

These leading industries are:

- ▶ High technology
- ▶ Biotechnology
- ▶ Health care
- ▶ Financial services
- ▶ Higher Education
- ▶ Tourism

#### High Technology

The high technology industry encompasses a number of economic activities that cut across traditional definitions of industrial sectors. Massachusetts high technology companies are heavily involved in computer software and related information technology development, research and development related to new technology products and procedures, and the manufacture and/or distribution of computer and electronic

<sup>37</sup> Boston Globe, January 2016.

related equipment. Boston based companies like Virtusa, Nuance Communications, Skyworks Solutions and Akamai Technologies all employ thousands of Massachusetts workers within the technology industry.

### Biotechnology

Boston is one of the leading centers for biotechnology (including pharmaceuticals and medical devices) in the U.S. The existence of a well-trained and highly educated work force and the wealth of medical and higher education facilities and personnel in the region make the Boston area one of the most desirable locations in the nation for the biotechnology industry. The biopharma industry employed over 63,000 people in Massachusetts in 2015.<sup>38</sup> Companies like Sanofi Genzyme, Philips, Thermo Fisher Scientific and Boston Scientific Corp., all with large offices in the Boston area, contribute substantially to the biotechnology industry.<sup>39</sup>

### Healthcare

Boston has a world-renowned reputation as a leader in the health care industry, which is a strong driver of the local economy. From medical education to training, research and the provision of medical services, Boston's medical institutions perform a wide variety of activities. The large amount of research and health care related activities at these institutions also act as a driver of other health care related industries, such as the biotech industry. The top 20 hospitals in the region accounted for approximately 111,000 full-time employees in 2015.<sup>40</sup> Massachusetts General Hospital, Brigham and Women's Hospital and UMass Memorial Medical Center represent the three largest hospitals in the Boston area.

### Financial Services

The Boston area is also a leader in the financial services industry. A substantial number of mutual fund companies, hedge funds, venture capital firms and wealth management and financial advisory companies are based in or have significant operations in Boston, including Fidelity, State Street and John Hancock Financial.

### Education

Massachusetts is the home of some of the nation's most prestigious colleges and universities. These higher education institutions attract undergraduate and graduate students from across the U.S. and around the world, generating increased demand for air travel. The top 20 regional institutions, including Harvard University, MIT, Boston University and Northeastern University, have a combined total enrollment of over 231,000 students.<sup>41</sup> These institutions play an important role in the regional economy, not only in terms of their direct workforce but also by spawning important scientific research that in turn leads to industry developments. A significant portion of the region's growth in high technology, biotechnology, financial services and health care emanates from the graduates and research produced by the area's universities. These well-known universities also provide a continuous supply of well-educated and highly trained workers for Boston's economy.

### Tourism

Tourism is an integral part of the Massachusetts economy. Millions of people visit Massachusetts and Boston every year to enjoy its rich historic and cultural heritage, attend cultural or sporting events, conduct business, visit area beaches and attend conventions at one of Boston's convention centers. Massachusetts had a record-breaking 28.2 million visitors in 2015, which added 3,000 new tourism jobs, increasing the total workforce to 135,000, a 2.3% increase from 2014.<sup>42</sup> Domestic and international travelers in Massachusetts spent \$20.2 billion on transportation, lodging, food, entertainment, recreation and retail shopping in 2015, representing an increase of 3.8 percent from 2014. Visitor spending in the Commonwealth during the same time period supported approximately 135,000 jobs (a 2.3 percent increase from 2014) and a payroll totaling \$4.4 billion (a 7.2 percent increase from 2014).<sup>43</sup>

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<sup>38</sup> Massachusetts Biotechnology Council, 2016; U.S. Bureau of Labor Statistics.

<sup>39</sup> Boston Business Journal, Book of Lists 2017.

<sup>40</sup> Ibid.

<sup>41</sup> Ibid.

<sup>42</sup> Massachusetts Office of Travel and Tourism.

<sup>43</sup> Massachusetts Office of Travel & Tourism, *The Economic Impact of Travel on Massachusetts Counties*, 2015

### 3.3 Historical Socioeconomic Trends and Future Outlook

#### 3.3.1 Population

Massachusetts has a slow growing population base compared to the U.S. overall, but the Commonwealth's population is extremely clustered within the Boston metro area. As of July 1, 2015, the Massachusetts Data Center estimates that population density is currently 871.1 persons per square mile versus 91.0 on a national level. Only two states are reported to be more concentrated than Massachusetts: Rhode Island and New Jersey.<sup>44</sup> As of 2015, the population within the Boston Service Area is estimated at 5.7 million.<sup>45</sup> As shown in Exhibit 3-8, since 2000, the population of the Boston Service Area has grown slightly faster than the Massachusetts population but slower than the U.S. population as a whole. From 2000 to 2015, the population of the Boston Service Area grew by 0.5 percent per year compared to the U.S. population growth of 0.9 percent per year.

**Exhibit 3-8: Historical and Forecast Regional and National Population Growth (2000 to 2030)**

	Historical		Actual 2015	Forecast		
	2000	2010		2020	2025	2030
<b>Population (in 000s)</b>						
Boston Service Area	5,298.3	5,495.4	5,721.5	5,875.9	6,035.6	6,190.1
Massachusetts	6,361.1	6,564.1	6,794.4	6,969.6	7,150.8	7,325.5
New England	13,949.7	14,466.2	14,727.6	15,125.4	15,537.2	15,935.7
Total US	282,162.4	309,347.1	321,420.6	336,382.5	352,314.6	368,644.1
<b>Boston Service Area Population as a Percent of:</b>						
% of Massachusetts	83.3%	83.7%	84.2%	84.3%	84.4%	84.5%
% of New England	38.0%	38.0%	38.8%	38.8%	38.8%	38.8%
% of US Total	1.9%	1.8%	1.8%	1.7%	1.7%	1.7%
<b>Average Annual Growth</b>						
	<b>10 Years</b>	<b>5 Years</b>	<b>5 Years</b>	<b>5 Years</b>	<b>5 Years</b>	<b>15 Years</b>
	<b>'00-'10</b>	<b>'10-'15</b>	<b>'15-'20</b>	<b>'20-'25</b>	<b>'25-'30</b>	<b>'15-'30</b>
Boston Service Area	0.4%	0.8%	0.5%	0.5%	0.5%	0.5%
Massachusetts	0.3%	0.7%	0.5%	0.5%	0.5%	0.5%
New England	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%
Total US	0.9%	0.8%	0.9%	0.9%	0.9%	0.9%

Note: The Boston Service Area includes Bristol, Essex, Middlesex, Norfolk, Plymouth, Suffolk and Worcester Counties; 1969-2013 Woods & Poole population data is historical from the U.S. Department of Commerce.  
Source: Woods & Poole Economics, 2017.

Population growth for the Boston Service Area is forecast by Woods & Poole Economics<sup>46</sup> to increase by 0.5 percent annually through 2030, which is the same as Massachusetts and New England (Exhibit 3-8). The Boston Service Area is a mature, densely populated region, and as a result, population is forecast to grow more slowly than the national average; the U.S. average annual population growth rate is forecast at 0.9 percent through 2030.

#### 3.3.2 Personal Income and Per Capita Income

Personal income for the Boston Service Area has historically increased at a similar rate as personal income for New England and the U.S. As shown in Exhibit 3-9, from 2000 to 2010, total personal income for the Boston Service Area grew by 1.5 percent annually, compared to 1.6 percent for New England and 1.7 percent for the nation. Between 2010 and 2015, average annual personal income growth for the Boston service area and Massachusetts picked up to 2.1 percent, compared to 2.4 percent for the U.S.

Per capita income levels in Boston have been consistently higher than those of the New England region and the rest of the U.S. In 2015, Boston's per capita income is estimated at \$57,296, approximately 4.2 percent

<sup>44</sup> Massachusetts State Data Center, Due Diligence Report, Second Quarter FY 2017.

<sup>45</sup> Woods and Poole, published in April 2017.

<sup>46</sup> Woods and Poole Economics is a Washington-based economic research, forecasting and data services firm that specializes in developing forecasts of economic and demographic information derived from U.S. Census data.

higher than New England's per capita income and 30.4 percent higher than the U.S. average. Per capita income in the Boston area increased at an average annual rate of 1.4 percent in the 15-year period between 2000 and 2015. During the same period, New England per capita income grew at 1.3 percent annually and national per capita income grew at 1.2 percent annually.

From 2015 to 2030, total personal income in the Boston Service Area, reflecting growth in population and average income, is forecast to grow at 2.0 percent annually, while per capita income is forecast to grow 1.5 percent annually (Exhibit 3-9). For this time period, personal income growth for Boston is projected to parallel growth for New England (projected at 2.0 percent), but lag the national U.S. projected growth of 2.4 percent.

**Exhibit 3-9: Historical and Forecast Regional and National Income Growth  
(2000 to 2030)**

	Historical		Actual 2015	Forecast		
	2000	2010		2020	2025	2030
<b>Total Personal Income (Millions)</b>						
Boston Service Area	\$255,589	\$297,706	\$337,570	\$375,521	\$415,221	\$455,233
Massachusetts	\$295,313	\$342,661	\$388,336	\$431,639	\$477,291	\$523,097
New England	\$630,094	\$741,032	\$809,439	\$897,602	\$993,221	\$1,088,376
Total US	\$10,392,779	\$12,257,005	\$14,118,231	\$15,937,064	\$17,951,536	\$20,031,667
% of Massachusetts	86.5%	86.9%	86.9%	87.0%	87.0%	87.0%
% of New England	40.6%	40.2%	41.7%	41.8%	41.8%	41.8%
% of US Total	2.5%	2.4%	2.4%	2.4%	2.3%	2.3%
	<b>10 Years</b>	<b>5 Years</b>	<b>5 Years</b>	<b>5 Years</b>	<b>5 Years</b>	<b>15 Years</b>
<b>Average Annual Growth</b>	<b>'00-'10</b>	<b>'10-'15</b>	<b>'15-'20</b>	<b>'20-'25</b>	<b>'25-'30</b>	<b>'15-'30</b>
Boston Service Area	1.5%	2.1%	2.2%	2.0%	1.9%	2.0%
Massachusetts	1.5%	2.1%	2.1%	2.0%	1.8%	2.0%
New England	1.6%	1.5%	2.1%	2.0%	1.8%	2.0%
Total US	1.7%	2.4%	2.5%	2.4%	2.2%	2.4%
<b>Per Capita Income</b>						
Boston Service Area	\$46,537	\$52,778	\$57,296	\$62,013	\$66,746	\$71,315
Massachusetts	\$46,425	\$52,195	\$57,155	\$61,932	\$66,746	\$71,408
New England	\$45,169	\$51,217	\$54,961	\$59,344	\$63,925	\$68,298
Total US	\$36,833	\$39,622	\$43,924	\$47,378	\$50,953	\$54,339
% of Massachusetts	100.2%	101.1%	100.2%	100.1%	100.0%	99.9%
% of New England	103.0%	103.0%	104.2%	104.5%	104.4%	104.4%
% of US Total	126.3%	133.2%	130.4%	130.9%	131.0%	131.2%
	<b>10 Years</b>	<b>5 Years</b>	<b>5 Years</b>	<b>5 Years</b>	<b>5 Years</b>	<b>15 Years</b>
<b>Average Annual Growth</b>	<b>'00-'10</b>	<b>'10-'15</b>	<b>'15-'20</b>	<b>'20-'25</b>	<b>'25-'30</b>	<b>'15-'30</b>
Boston Service Area	1.3%	1.7%	1.6%	1.5%	1.3%	1.5%
Massachusetts	1.2%	1.8%	1.6%	1.5%	1.4%	1.5%
New England	1.3%	1.4%	1.5%	1.5%	1.3%	1.5%
Total US	0.7%	2.1%	1.5%	1.5%	1.3%	1.4%

Note: The Boston Service Area includes Bristol, Essex, Middlesex, Norfolk, Plymouth, Suffolk, and Worcester Counties; figures in 2009 dollars.  
Source: Woods & Poole Economics.

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## 4. BOSTON LOGAN INTERNATIONAL AIRPORT TRAFFIC AND SERVICE CHARACTERISTICS

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### 4.1 Introduction

Boston Logan International Airport is the busiest commercial airport in New England serving a record 36.3 million commercial airline passengers in CY 2016. Logan is the principal airport for the greater Boston metropolitan area and the international and long-haul gateway for much of New England. In recent years, Logan's passenger traffic has grown to new record levels. The Airport is one of the leading U.S. airports in terms of air passenger volume and airline revenue generation and continues to be a highly desirable market for air carriers.

A rapid increase in LCC service and international service at the Airport over the past decade has contributed significantly to growth in the Boston market. JetBlue began service at Logan Airport in 2004 and has grown to be the market leader. Logan is currently JetBlue's second largest focus city after New York-JFK. As of July 2017, JetBlue is the leading air service provider at Logan, scheduled to operate 145 average daily departures from Logan, including 139 domestic daily departures and six international daily departures. Boston is also served by Southwest, Spirit, Virgin America, and Sun Country. Since entering the Boston market in 2009, Southwest has also expanded significantly at Logan and is expected to operate 38 daily departures from Logan in July 2017. Since 2013, international services has grown rapidly with 21 new international destinations introduced by 16 foreign carriers from Logan. As of July 2017, there are 30 foreign carriers and three U.S. carriers providing services to 54 international destinations.

Historically, Logan has consistently rebounded from setbacks and periods of weak demand. The Airport recovered after 9/11, with passenger traffic in 2007 exceeding the previous peak achieved in 2000. Similarly, Logan recovered from the extraordinary rise in fuel prices and the global economic downturn that depressed traffic levels in 2008 and 2009, reaching new record-high passenger levels in 2011 and in each year thereafter.

Similar to other large hub airports across the U.S., over the past decade Logan has seen a trend in increasing aircraft size and passenger load factors. In CY 2016, passenger traffic<sup>47</sup> at Logan increased 31 percent over 2000 levels. However, in CY 2016 commercial airline operations at Logan were 20 percent lower than 2000 levels. This trend continued in CY 2016, with CY 2016 Airport passengers and aircraft operations increasing by 8.5 percent and 4.5 percent, respectively, compared with CY 2015. Part of this difference was caused by a shift in aircraft fleet mix at Logan. Many of the small regional jet (RJ)<sup>48</sup> aircraft (with 30 to 50 seats) have been replaced with larger RJs and turboprops (generally with 70 or more seats), and many of the new routes introduced to Logan in recent years are international, which routes are flown by larger widebody planes. As a reaction to the challenging operating environment over the past decade, airlines have also placed increasing emphasis on capacity management, putting efforts into better matching capacity to demand and filling their planes more effectively. Similar to other U.S. airports, airline load factors have increased at Logan. This change in aircraft fleet mix and increase in load factors has had a dramatic effect on the average number of passengers per operation at the Airport, which climbed from 61 in 2000 to 100 in 2016.

This section reviews recent and long-term trends in passenger traffic, airline service, aircraft activity, air cargo and general aviation at Logan. A comparison of Logan's performance to that of other large U.S. airports is also presented.

### 4.2 Logan Airport Service Area

Logan Airport fulfills a number of roles in the local, New England and national air transportation networks:

1. Logan is the primary airport serving the Boston metropolitan area, and is the principal New England airport for long-haul services;
2. Logan is a major U.S. international gateway airport for transatlantic services;

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<sup>47</sup> Excludes GA passengers.

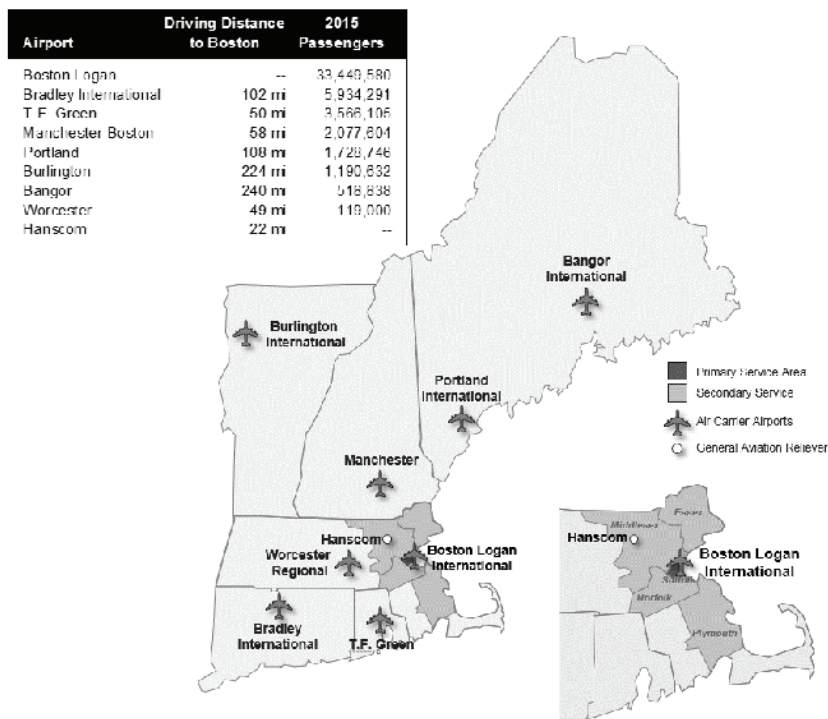
<sup>48</sup> Regional jets ("RJs") are small jet powered aircraft with 90 or fewer seats. RJs operate at higher speeds and can fly longer stage lengths than turboprops. The operating range for a typical RJ is 800 to 1,000 miles, compared to 400 miles for a turboprop. The distinction between RJs and jets is blurring as larger regional jet models with up to 100 seats have been introduced. In this report, RJs over 90 seats are included in the large jet category.

3. Logan serves as a regional connecting hub for small northern New England markets and the Massachusetts maritime counties of Barnstable, Dukes and Nantucket; and
4. Logan is the busiest air cargo center in New England.

An airport’s service area refers to the local geographic region from which it draws passengers. The quality of service at an airport, as well as the proximity, accessibility and service offerings of other airports in the region, generally determine airport service area boundaries. The “core” or primary service area generates the majority of an airport’s passengers. The secondary service area extends outward from the core and may overlap with the service areas of other airports.

The primary service area for Logan Airport consists of Suffolk, Middlesex, Norfolk, Essex and Plymouth counties in Massachusetts, referred to as the “Boston Service Area” (Exhibit 4-1). Logan is the principal commercial airport serving this region. While Hanscom Field (also owned and operated by Massport), is located within Logan’s primary service area, it currently has no scheduled commercial operations and serves as a general aviation reliever airport to Logan.

**Exhibit 4-1: Boston Logan Airport, Primary and Secondary Service Areas**



Note: Worcester and Hanscom airports are owned by the Authority.  
Sources: Massport and airport records.

The Airport’s secondary service area encompasses the rest of Massachusetts and the other New England states. Smaller regional commercial service airports, such as T.F. Green in Warwick, Rhode Island and Manchester-Boston in Manchester, New Hampshire, are located in the secondary service area and have some overlap with and may draw some of their passengers from Logan’s primary service area, though this trend has waned in recent years as LCC services expanded at Logan and airlines withdrew many services from the secondary airports.

Other commercial service airports in the Airport's secondary service area are Worcester Regional Airport in Worcester, Massachusetts, which is also owned by Massport;<sup>49</sup> Portland International Jetport in Portland, Maine; Bangor International Airport in Bangor, Maine; Bradley International Airport in Hartford, Connecticut; and Burlington International Airport in Burlington, Vermont.

### 4.3 Airport Passengers

In CY 2016, Logan Airport served a record 36.3 million total passengers. Compared to CY 2015, total passengers at the Airport saw an increase of 8.5 percent. A history of Logan's passenger traffic is presented in Exhibit 4-2.

Passenger traffic at the Airport fully recovered from the 2008-2009 global economic downturn, returning to pre-recession levels in 2011 and reaching new records in each subsequent year. Factors contributing to traffic recovery and growth at Logan include the continued expansion of JetBlue at the Airport, the entry of other LCCs such as Southwest and Virgin America, sharp service reductions at secondary airports in the region (T.F. Green and Manchester-Boston), and new international air service. Over the long term, despite the numerous external shocks and challenges, from 2000 to 2016, Logan's passenger traffic grew by an average 1.7 percent per year, which was faster than the total U.S. traffic growth of 1.3 percent.<sup>50</sup> Logan has the third highest O&D share for domestic traffic among U.S. large hub airports, with O&D passengers representing 97.0 percent<sup>51</sup> of domestic passengers using the Airport. Total O&D traffic accounted for approximately 94.5 percent<sup>52</sup> of total passengers at the Airport in 2016, including domestic and international passengers.

Since connecting passengers represent only a small percentage of Logan's passenger traffic, Logan is not reliant on connecting passengers and therefore is not subject to large traffic fluctuations due to hub carrier strategy changes in the same manner as connecting hub airports are.

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<sup>49</sup> On July 1, 2010, in accordance with the Commonwealth's Transportation Reform Act, Massport assumed ownership of the Worcester Regional Airport from the City of Worcester. In November 2013, JetBlue commenced daily nonstop services from Worcester to Orlando and Ft. Lauderdale, which it still serves as of June 2017.

<sup>50</sup> Bureau of Transportation Statistics.

<sup>51</sup> Source: U.S. DOT O&D Survey via Database Products, CY 2016.

<sup>52</sup> Source: U.S. DOT O&D Survey via Database Products, CY 2016.

**Exhibit 4-2: Historical Passenger Traffic at Boston Logan Airport  
(CY 1970 to CY 2016)**

Year	BOS Passengers (000s) <sup>1</sup>			General Aviation	Logan Total	U.S. Passengers (000s) <sup>2</sup>		
	Domestic	Intl.	Total			Domestic	Intl.	Total
1970	8,476	916	9,393	n/a	9,393	153,662	16,260	169,922
1980	12,564	2,159	14,722	n/a	14,722	247,069	49,831	296,901
1990	19,455	3,359	22,814	n/a	22,814	423,566	41,992	465,558
2000	23,101	4,513	27,614	113	27,727	599,851	74,399	674,250
2005	22,729	4,237	26,966	122	27,088	657,261	81,367	738,628
2006	23,556	4,050	27,606	119	27,725	658,363	86,358	744,721
2007	23,838	4,153	27,991	111	28,102	679,168	90,454	769,622
2008	22,032	3,977	26,010	93	26,103	651,709	91,603	743,312
2009	21,767	3,696	25,463	49	25,512	618,051	85,848	703,899
2010	23,688	3,682	27,370	59	27,429	629,538	90,959	720,497
2011	24,831	3,962	28,794	114	28,908	638,247	92,549	730,796
2012	24,743	4,384	29,127	109	29,236	642,289	94,410	736,699
2013	25,578	4,546	30,124	95	30,219	645,616	97,489	743,105
2014	26,546	4,992	31,538	96	31,634	662,826	99,879	762,705
2015	27,810	5,534	33,344	105	33,450	696,027	102,203	798,230
2016	29,591	6,587	36,179	110	36,288	719,000	103,900	822,900
<b>Average Annual Growth</b>								
1970-1980	4.0%	8.9%	4.6%	-	4.6%	4.9%	11.9%	5.7%
1980-1990	4.5%	4.5%	4.5%	-	4.5%	5.5%	-1.7%	4.6%
1990-2000	1.7%	3.0%	1.9%	-	2.0%	3.5%	5.9%	3.8%
2000-2011	0.7%	-1.2%	0.4%	0.1%	0.4%	0.6%	2.0%	0.7%
2011-2016	3.6%	10.7%	4.7%	-0.9%	4.7%	2.4%	2.3%	2.4%
<b>Percent Change Over Prior Year</b>								
2011	4.8%	7.6%	5.2%	94.7%	5.4%	1.4%	1.7%	1.4%
2012	-0.4%	10.6%	1.2%	-4.6%	1.1%	0.6%	2.0%	0.8%
2013	3.4%	3.7%	3.4%	-13.1%	3.4%	0.5%	3.3%	0.9%
2014	3.8%	9.8%	4.7%	1.4%	4.7%	2.7%	2.5%	2.6%
2015	4.8%	10.9%	5.7%	9.3%	5.7%	5.0%	2.3%	4.7%
2016	6.4%	19.0%	8.5%	4.2%	8.5%	3.3%	1.7%	3.1%

<sup>1</sup> Includes commercial airline passengers and general aviation passengers. General aviation passengers include passengers flying on private, corporate and on-demand air taxi flights. Domestic includes regional passengers.

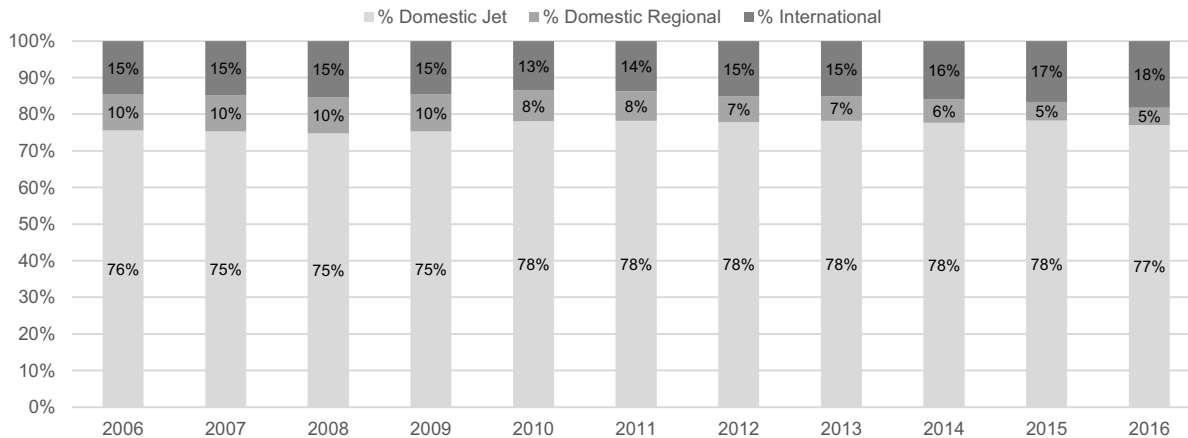
<sup>2</sup> Total U.S. Enplanements. Excludes GA passengers.

Source: Massport and BTS.

As shown in Exhibit 4-3 below, the traffic mix at the Airport is strongly domestic, with 82 percent of the Airport's total passengers in 2016 consisting of domestic and regional passengers. However, the Airport has seen a rapid growth in international passengers in recent years, increasing at an average annual growth rate of 10.7 percent between 2011 and 2016. This compares to overall U.S. international passenger growth of 2.3 percent per year over the same period. The international segment represented 18.2 percent of total passengers at Logan in 2016. Historical growth trends in each of these segments are discussed in the following sections.



**Exhibit 4-3: Logan Domestic and International Share of Commercial Passenger Traffic (CY 2006 to CY 2016)**



Note: Excludes general aviation passengers.  
Source: Massport.

Based on preliminary 2016 statistics, Logan Airport is among the top U.S. airports in terms of total passengers, ranking as the 17<sup>th</sup> busiest U.S. airport in CY 2016 (Exhibit 4-4). Logan is also one of the fastest growing FAA large hubs.<sup>53</sup> In CY 2016, passenger traffic at Logan increased by 8.5 percent over the prior year, substantially faster than the large hub average growth of 3.5 percent. Annual passenger growth at Logan since 2011 has averaged 4.7 percent, ranking 5<sup>th</sup> among U.S. large hub airports, and outperforming most of its peer group airports (Exhibit 4-5).

**Exhibit 4-4: Ranking of U.S. Large Hub Airports Based on Total Passengers (CY 2016)<sup>54</sup>**

Rank	Airport	Passengers (millions)	% Change from 2015	Rank	Airport	Passengers (millions)	% Change from 2015
1	Atlanta	104.2	2.6%	16	Minneapolis	37.4	2.3%
2	Los Angeles	80.9	7.9%	<b>17</b>	<b>Boston</b>	<b>36.3</b>	<b>8.5%</b>
3	Chicago O'Hare	78.3	1.8%	18	Detroit	34.4	2.9%
4	Dallas/Fort Worth	65.7	0.6%	19	Philadelphia	30.1	-4.3%
5	New York - JFK	58.9	3.5%	20	New York - LGA	29.8	5.0%
6	Denver	58.3	7.9%	21	Fort Lauderdale	29.2	8.4%
7	San Francisco	53.1	6.1%	22	Baltimore	25.2	5.8%
8	Las Vegas	47.5	4.5%	23	Washington National	23.6	2.5%
9	Seattle/Tacoma	45.7	8.0%	24	Salt Lake City	23.2	4.5%
10	Miami	44.6	0.5%	25	Chicago Midway	22.7	2.1%
11	Charlotte	44.4	-1.0%	26	Washington Dulles	21.8	1.5%
12	Phoenix	43.3	-1.7%	27	San Diego	20.7	3.3%
13	Orlando	41.9	8.3%	28	Tampa	18.9	1.1%
14	Houston - IAH	41.6	-3.2%	29	Portland	18.4	8.9%
15	New York - EWR	40.5	8.0%				
<b>Total Large Hubs</b>		<b>1,220.6</b>	<b>3.5%</b>				

Note: Includes only airports in the continental United States.  
Sources: ACI Preliminary 2016 statistics.

<sup>53</sup> The FAA defines large hubs as airports that enplane at least one percent of total U.S. air passengers. There are currently 29 large hub airports, excluding Honolulu (HNL).  
<sup>54</sup> Only large hub airports within the continental United States are shown.

**Exhibit 4-5: Fastest Growing U.S. Large Hub Airports  
(CY 2016)**

Rank	Airport	Passengers (millions)			Average Annual Growth	Rank	Airport	Passengers (millions)			Average Annual Growth
		2011	2016					2011	2016		
1	Seattle/Tacoma	32.5	45.7	7.1%	16	Miami	38.3	44.6	3.1%		
2	Portland	13.7	18.4	6.1%	17	Charlotte	39.0	44.4	2.6%		
3	Los Angeles	61.9	80.9	5.5%	18	Dallas/Fort Worth	57.8	65.7	2.6%		
4	San Francisco	40.9	53.1	5.3%	19	Salt Lake City	20.4	23.2	2.6%		
<b>5</b>	<b>Boston</b>	<b>28.9</b>	<b>36.3</b>	<b>4.7%</b>	20	Tampa	16.7	18.9	2.5%		
6	Washington National	18.8	23.6	4.6%	21	Minneapolis	33.1	37.4	2.5%		
7	Fort Lauderdale	23.3	29.2	4.6%	22	Atlanta	92.4	104.2	2.4%		
8	New York - LGA	24.1	29.8	4.4%	23	Baltimore	22.4	25.2	2.4%		
9	New York - JFK	47.7	58.9	4.3%	24	Denver	52.8	58.3	2.0%		
10	San Diego	16.9	20.7	4.2%	25	Phoenix	40.6	43.3	1.3%		
11	Chicago Midway	18.8	22.7	3.8%	26	Detroit	32.4	34.4	1.2%		
12	New York - EWR	33.7	40.5	3.7%	27	Houston - IAH	40.1	41.6	0.7%		
13	Orlando	35.4	41.9	3.4%	28	Philadelphia	30.8	30.1	-0.5%		
14	Chicago O'Hare	66.7	78.3	3.3%	29	Washington Dulles	23.1	21.8	-1.1%		
15	Las Vegas	40.6	47.5	3.2%							
<b>Total Large Hubs</b>		<b>1,043.9</b>	<b>1,220.6</b>	<b>3.2%</b>							

Note: Includes only airports in the continental United States.  
Sources: ACI Preliminary 2016 statistics.

Logan is an extremely competitive market where multiple carriers compete actively for passenger traffic share. JetBlue has been the leading airline at Logan Airport, since it surpassed Delta and American Airways in 2011. In 2016, JetBlue carried approximately 9.7 million passengers, maintaining a market share of close to 27 percent at Logan. American Airlines, once the leading carrier, represents the second largest carrier at Logan, carrying 6.9 million passengers in 2016, which represented 19.0 percent of total passengers at Logan. Following its merger with US Airways in December 2013, American Airlines continues to finalize integrated operations and decrease seat capacity, resulting in lower market share in 2016. Delta ranked third with 5.3 million passengers or 14.5 percent of the total. United ranked fourth with 10.7 percent market share, followed by Southwest with 8.3 percent market share. In 2016, the top five carriers at Logan accounted for approximately 79.2 percent of the Airport's passenger traffic. Compared to 2015, leading carriers at Logan, with the exception of JetBlue and Southwest, all saw a slight decline in market share due to growth by other carriers at the Airport and the entry of new airlines. The breakdown of passenger market share by airline at Logan is presented in Exhibit 4-6.

**Exhibit 4-6: Airline Share of Total Logan Passengers  
(CY 2011, CY 2015 and CY 2016)**

Airline <sup>1</sup>	CY 2011			CY 2015			CY 2016		
	Rank	Passengers	Share	Rank	Passengers	Share	Rank	Passengers	Share
JetBlue	2	6,588,282	22.9%	1	8,893,840	26.6%	1	9,711,217	26.8%
American	1	7,092,325	24.6%	2	7,128,494	21.3%	2	6,882,236	19.0%
Delta	3	4,414,996	15.3%	3	4,933,973	14.8%	3	5,259,688	14.5%
United	4	3,563,328	12.4%	4	3,739,593	11.2%	4	3,881,404	10.7%
Southwest	5	2,889,682	10.0%	5	2,583,708	7.7%	5	3,018,073	8.3%
<b>Subtotal</b>		<b>24,548,613</b>	<b>85.3%</b>		<b>27,279,608</b>	<b>81.6%</b>		<b>28,752,618</b>	<b>79.2%</b>
All Other Carriers		4,244,909	14.7%		6,169,972	18.4%		7,535,424	20.8%
<b>Total Airport</b>		<b>28,793,522</b>			<b>33,449,580</b>			<b>36,288,042</b>	

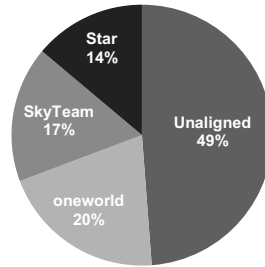
<sup>1</sup> Includes passengers on regional airline affiliates.

Note: Leading carriers at Logan saw a slight decline in market share due to growth by other carriers.  
Source: Massport.

Unlike other airports that predominantly cater to flights by a single carrier or alliance, Logan's service is less concentrated. As of July 2017, 49 percent of scheduled weekly departing seats at Logan are on carriers that

are unaligned with one of the three major alliances, while 51 percent is split between Oneworld, SkyTeam, and Star alliances (Exhibit 4-7).

**Exhibit 4-7: Alliance Share of Weekly Departing Seats at Logan (July 2017)**

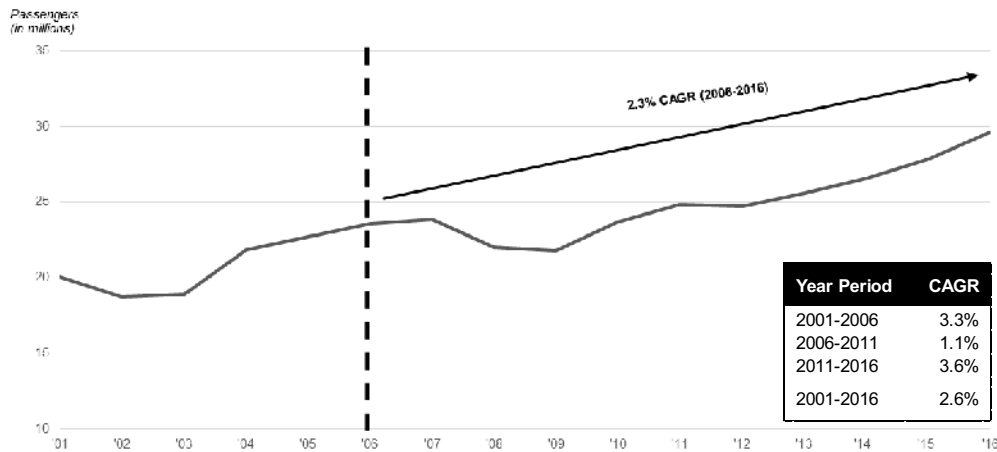


Source: Innovata.

**4.3.1 Domestic Passengers**

Logan’s domestic passenger traffic reached a new peak of 29.6 million in CY 2016 (see Exhibit 4-8) following a decline and recovery period. Rising fuel costs and the economic recession caused Logan’s passengers to decline from 2007 to 2009. Domestic passenger traffic began to recover in 2010, largely as a result of the expansion of LCC service at Logan. JetBlue’s market entry in 2004 and subsequent aggressive expansion at the Airport has led to sustained growth in the domestic passenger market segment. Between 2006 and 2016, domestic passenger traffic at Logan grew by an average annual rate of 2.3 percent, significantly faster than overall domestic passenger traffic in the U.S., which increased by 0.9 percent<sup>55</sup> per year over the same period.

**Exhibit 4-8: Historical Domestic Passenger Traffic at Boston Logan Airport (CY 2001 to CY 2016)**



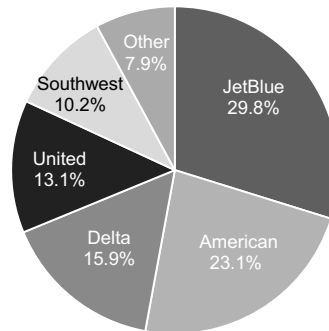
Note: Excludes general aviation passengers.  
Source: Massport.

In terms of domestic passengers, JetBlue was the leading domestic carrier at Logan in CY 2016 with a 29.8 percent share (see Exhibit 4-9). American was second with a 23.1 percent market share. Delta was the third

<sup>55</sup> U.S. DOT, Bureau of Transportation Statistics; includes scheduled traffic only.

largest domestic carriers at Logan with 15.9 percent of domestic passengers, followed by United with 13.1 percent and Southwest with 10.2 percent.

**Exhibit 4-9: Airline Market Share of Logan Domestic Passengers  
(CY 2016)**



Note: Regional airline passengers are grouped with their mainline carrier partners; Excludes general aviation passengers.  
Source: Massport.

The strength of the Boston domestic passenger market derives from (1) the Origin and Destination (O&D) nature of the market, (2) the large pool of domestic fares generated, (3) the lack of a dominant carrier and the relative balance between carriers operating at the airport and (4) the breadth of service offering (Legacy and LCC) that allow Boston to capture a large portion of its service area.

Logan Airport is principally an O&D airport, meaning that the majority of passengers originate from or travel to the Boston Service Area. Because of Logan's geographic location on the Northeast U.S. coast, no major airline has established domestic connecting hub operations at the Airport. More than nine out of ten (97.0 percent<sup>56</sup>) domestic passengers using Logan are O&D passengers. This is the third highest O&D share among U.S. large hub airports (see Exhibit 4-10) and is a distinguishing characteristic of Logan that has remained stable over time.<sup>57</sup> Since connecting passengers represent only a small percentage of Logan's passenger traffic, long-term passenger growth at the Airport is primarily a function of the underlying market demand. Unlike major connecting hub airports, Logan is not reliant on connecting passengers and therefore is not subject to large traffic fluctuations that may result from changes in a hubbing carrier's network strategy.

<sup>56</sup> For CY 2016 period.

<sup>57</sup> Since 1996, Logan's O&D percentage has been estimated at between 86 and 95 percent.

**Exhibit 4-10: Domestic Local and Connecting Passenger Shares for Top U.S. Large Hub Airports (CY 2016)**

% Local Rank	Airport	% of Domestic Psgrs		% Local Rank	Airport	% of Domestic Psgrs	
		O&D	Connecting			O&D	Connecting
1	Orlando	97.5%	2.5%	16	Seattle/Tacoma	70.1%	29.9%
2	Tampa	97.4%	2.6%	17	Miami	64.6%	35.4%
<b>3</b>	<b>Boston</b>	<b>97.0%</b>	<b>3.0%</b>	18	Phoenix	64.3%	35.7%
4	San Diego	96.1%	3.9%	19	Chicago Midway	63.5%	36.5%
5	Fort Lauderdale	91.8%	8.2%	20	Washington Dulles	62.7%	37.3%
6	New York - LGA	91.6%	8.4%	21	Denver	60.1%	39.9%
7	Washington National	88.3%	11.7%	22	Salt Lake City	58.4%	41.6%
8	Portland	88.1%	11.9%	23	Minneapolis	56.9%	43.1%
9	Las Vegas	85.9%	14.1%	24	Detroit	55.9%	44.1%
10	San Francisco	80.3%	19.7%	25	Chicago O'Hare	55.5%	44.5%
11	Los Angeles	79.3%	20.7%	26	Houston - IAH	50.0%	50.0%
12	New York - JFK	78.9%	21.1%	27	Dallas/Fort Worth	45.9%	54.1%
13	New York - EWR	78.6%	21.4%	28	Atlanta	36.3%	63.7%
14	Philadelphia	71.0%	29.0%	29	Charlotte	29.8%	70.2%
15	Baltimore	70.7%	29.3%				
	<b>Average Large Hubs</b>	<b>67.0%</b>	<b>33.0%</b>				

Note: Includes only airports in the continental United States.  
 Source: U.S. DOT O&D Survey via Database Products; ICF Analysis.

Boston is one of the fastest growing markets in the U.S. In CY 2016, Logan Airport served 26.3 million domestic O&D passengers, making Boston the 11<sup>th</sup> largest domestic O&D market in the United States. Logan's domestic O&D passengers grew at an average annual rate of 4.1 percent from CY 2011 to CY 2016, as shown in Exhibit 4-11, ranking 9<sup>th</sup> in terms of O&D growth among the top 20 domestic O&D markets. On average, O&D growth at the top 20 U.S. markets increased 4.3 percent annually from CY 2011 to CY 2016. Domestic O&D passengers in other East Coast markets, except New York and Atlanta, grew at markedly slower rates than Logan – Philadelphia (2.9 percent), Tampa (2.8 percent), Orlando (3.2 percent) and Fort Lauderdale (3.1 percent).

**Exhibit 4-11: Comparison of Domestic O&D Passenger Growth in Largest U.S. Markets (CY 2011 to CY 2016)**

Avg. Annual Change Rank	Market	Domestic O&D Passengers		Avg. Annual Change (2011-2016)	Avg. Annual Change Rank	Market	Domestic O&D Passengers		Avg. Annual Change (2011-2016)
		CY 2011	CY 2016				CY 2011	CY 2016	
1	Los Angeles	31.3	42.7	6.4%	11	San Diego	14.8	17.9	3.9%
2	Dallas/Fort Worth	25.6	34.2	5.9%	12	Washington	22.2	26.8	3.9%
3	Atlanta	24.4	31.4	5.2%	13	Phoenix	21.6	25.7	3.5%
4	San Francisco	22.9	29.3	5.1%	14	Houston	18.5	21.9	3.4%
5	Seattle/Tacoma	20.4	26.2	5.1%	15	Detroit	13.4	15.9	3.4%
6	Chicago	36.6	46.7	5.0%	16	Orlando	27.1	31.7	3.2%
7	Denver	25.0	31.0	4.4%	17	Fort Lauderdale	17.4	20.3	3.1%
8	New York	53.3	65.4	4.2%	18	Philadelphia	15.1	17.4	2.9%
<b>9</b>	<b>Boston</b>	<b>21.6</b>	<b>26.3</b>	<b>4.1%</b>	19	Las Vegas	29.4	33.9	2.9%
10	Minneapolis	14.8	18.0	4.0%	20	Tampa	13.8	15.9	2.8%
	<b>Total Top 20</b>	<b>469.1</b>	<b>578.6</b>	<b>4.3%</b>					

Note: Top 20 markets based on CY 2016 domestic O&D passengers. New York includes JFK, LaGuardia and Newark airports. Washington includes Reagan National and Dulles airports. Houston includes Hobby and George Bush Intercontinental airports. Dallas includes Love Field and Dallas/Ft. Worth airports. Chicago includes Midway and O'Hare airports.

Includes only airports in the continental United States.  
 Source: U.S. DOT, O&D Survey, via Database Products.

Over the past five years, despite strong domestic passenger growth, Boston has held its yield better than most markets. The average domestic airline yield at Logan and a few other large hub airports has been increasing as airlines have tightly controlled capacity and improved revenue management in recent years. As shown in Exhibit 4-12, growth in domestic passenger yields at Logan was 0.3 percent annually between CY 2011 and

CY 2016, compared to the average annual decline of 0.6 percent for all U.S. large hubs. Domestic passenger revenues at the Airport, excluding ancillary fees for baggage, reservations changes and other items, totaled \$4.6 billion for 2016. Boston ranks 7<sup>th</sup> in terms of yield growth (Exhibit 4-12) and 5<sup>th</sup> in airline revenue generation (Exhibit 4-13) due to its longer average stage length.

**Exhibit 4-12: Comparison of Average Domestic Yield Trends at U.S. Large Hubs  
(CY 2011 to CY 2016)**

Avg. Annual Change Rank	Airport	Avg. Stage Length (miles)	Domestic Yield		Avg. Annual Change (2011-2016)
			CY 2011	CY 2016	
1	Charlotte	923	\$ 0.20	\$ 0.21	1.2%
2	San Francisco	1,612	\$ 0.12	\$ 0.13	1.1%
3	Phoenix	1,224	\$ 0.13	\$ 0.13	0.7%
4	Tampa	1,099	\$ 0.13	\$ 0.14	0.7%
5	San Diego	1,392	\$ 0.12	\$ 0.12	0.4%
6	New York - JFK	1,663	\$ 0.12	\$ 0.13	0.3%
<b>7</b>	<b>Boston</b>	<b>1,315</b>	<b>\$ 0.13</b>	<b>\$ 0.13</b>	<b>0.3%</b>
8	Salt Lake City	1,183	\$ 0.15	\$ 0.15	0.1%
9	Detroit	1,060	\$ 0.16	\$ 0.16	0.0%
10	Washington Dulles	1,459	\$ 0.15	\$ 0.15	-0.1%
11	Denver	1,074	\$ 0.14	\$ 0.14	-0.3%
12	Orlando	1,135	\$ 0.12	\$ 0.12	-0.4%
13	Philadelphia	1,186	\$ 0.15	\$ 0.15	-0.5%
14	Seattle/Tacoma	1,465	\$ 0.12	\$ 0.11	-0.5%
15	New York - EWR	1,420	\$ 0.15	\$ 0.15	-0.6%
16	Miami	1,274	\$ 0.13	\$ 0.13	-0.6%
17	Los Angeles	1,585	\$ 0.12	\$ 0.11	-0.7%
18	New York - LGA	989	\$ 0.17	\$ 0.17	-0.8%
19	Minneapolis	1,099	\$ 0.17	\$ 0.16	-0.9%
20	Atlanta	910	\$ 0.18	\$ 0.18	-1.0%
21	Portland	1,364	\$ 0.12	\$ 0.12	-1.1%
22	Washington National	1,008	\$ 0.18	\$ 0.17	-1.2%
23	Fort Lauderdale	1,206	\$ 0.11	\$ 0.11	-1.4%
24	Las Vegas	1,250	\$ 0.12	\$ 0.11	-1.6%
25	Baltimore	1,111	\$ 0.15	\$ 0.13	-1.7%
26	Houston - IAH	1,151	\$ 0.19	\$ 0.18	-1.8%
27	Chicago Midway	936	\$ 0.15	\$ 0.14	-2.0%
28	Chicago O'Hare	1,040	\$ 0.17	\$ 0.15	-2.3%
29	Dallas/Fort Worth	1,063	\$ 0.18	\$ 0.16	-2.8%
	<b>Average Large Hub</b>	<b>1,214</b>	<b>\$ 0.15</b>	<b>\$ 0.14</b>	<b>-0.6%</b>

Note: Includes only airports in the continental United States.  
Source: U.S. DOT, O&D Survey.

Logan Airport represents a large and important domestic revenue market for the U.S. airlines. Based on enplanements, Boston captures an oversized share of revenue. In CY 2016, Logan Airport was the 15<sup>th</sup> largest in terms of enplanements but the 5<sup>th</sup> largest U.S. airport in terms of airline passenger fare revenues (Exhibit 4-13).

**Exhibit 4-13: Domestic Airline Revenue Generation for Large Hub U.S. Airports  
(CY 2016)**

Rank		Airport	Revenue (\$ millions)	Rank		Airport	Revenue (\$ millions)
Rev.	Enpl.			Rev.	Enpl.		
1	3	Los Angeles	\$7,719	16	12	Minneapolis	\$3,213
2	9	San Francisco	\$5,998	17	19	Philadelphia	\$3,112
3	2	Chicago O'Hare	\$5,253	18	26	San Diego	\$3,109
4	1	Atlanta	\$4,994	19	14	Houston - IAH	\$2,792
<b>5</b>	<b>15</b>	<b>Boston</b>	<b>\$4,641</b>	20	13	Detroit	\$2,736
6	6	Las Vegas	\$4,640	21	21	Fort Lauderdale	\$2,595
7	5	Denver	\$4,636	22	27	Tampa	\$2,391
8	10	Seattle/Tacoma	\$4,358	23	20	Baltimore	\$2,341
9	11	Orlando	\$4,355	24	28	Portland	\$2,260
10	16	New York - EWR	\$4,340	25	7	Charlotte	\$2,185
11	18	New York - JFK	\$4,222	26	25	Miami	\$2,123
12	17	New York - LGA	\$3,985	27	23	Salt Lake City	\$2,086
13	4	Dallas/Fort Worth	\$3,962	28	30	Washington Dulles	\$1,724
14	8	Phoenix	\$3,913	29	24	Chicago Midway	\$1,689
15	22	Washington National	\$3,238				

Note: Includes only airports in the continental United States.  
Source: U.S. DOT, O&D Database, Database Products.

Because of the large O&D base, strong revenue generation and high O&D passenger ratio, the Airport is a highly competitive market for airlines. Of all large hub airports, Logan has the fourth lowest concentration of service flown by the top three carriers, highlighting the competitive nature of the Boston market (Exhibit 4-14). JetBlue is currently the leading domestic air service provider at Logan in terms of seat capacity, with 31.6 percent of the Airport's scheduled domestic seats (as of July 2017). American Airlines is second with a 20.3 percent share, and Delta, including its regional carrier affiliates, is the third largest carrier, providing 16.4 percent of Logan's domestic seat capacity.

Given Logan's strong position as an O&D market, any future U.S. airline consolidation (through bankruptcies or mergers) is not anticipated to have a detrimental long-term effect on service levels. Initially, new consolidation could lead to service reductions, but Logan's strong O&D demand, high yield business passengers and positive growth outlook are expected to attract new services from incumbent carriers or new carriers seeking to capitalize on new opportunities. Historically, Airport passengers have grown from 14.7 million in 1980 to 28.8 million in 2001 and to 36.3 million in 2016. Over this 36-year period, many carriers have discontinued operations at the Airport (e.g. Eastern, TWA, Pan AM, New York Air, Braniff, Peoples Express and Frontier), yet passenger traffic has continued to grow as other airlines have replaced the lost services. Based on past history, the strong O&D passenger demand in the Boston market is expected to be met regardless of changes in the airline landscape or further consolidation.

**Exhibit 4-14: Domestic Carrier Market Share at Boston Logan and Other Large Hub Airports,  
Share of Scheduled Seats  
(July 2017)**

Rank	Airport	Code	Carrier Share of Non-Stop Domestic Weekly Seats			
			Largest	2nd largest	3rd Largest	All Other
1	Los Angeles	LAX	21.7%	20.5%	17.4%	40.4%
2	Fort Lauderdale	FLL	23.9%	22.2%	20.3%	33.6%
3	Orlando	MCO	30.2%	14.7%	13.9%	41.2%
<b>4</b>	<b>Boston</b>	<b>BOS</b>	<b>31.6%</b>	<b>20.3%</b>	<b>16.4%</b>	<b>31.8%</b>
5	New York - JFK	JFK	39.9%	36.9%	17.5%	5.8%
6	San Diego	SAN	40.4%	12.8%	12.7%	34.1%
7	Tampa	TPA	40.8%	16.6%	16.5%	26.1%
8	Denver	DEN	40.4%	30.8%	12.9%	15.8%
9	New York - LGA	LGA	42.3%	28.2%	9.4%	20.1%
10	Portland	PDX	40.8%	19.1%	13.3%	26.9%
11	Las Vegas	LAS	43.7%	10.0%	9.7%	36.5%
12	San Francisco	SFO	47.3%	12.3%	10.9%	29.6%
13	Chicago O'Hare	ORD	47.1%	39.2%	5.0%	8.7%
14	Phoenix	PHX	48.2%	36.7%	5.9%	9.2%
15	Seattle/Tacoma	SEA	49.0%	22.3%	8.3%	20.4%
16	Washington National	DCA	49.8%	15.3%	14.1%	20.9%
17	Honolulu	HNL	57.2%	13.7%	9.2%	19.8%
18	New York - EWR	EWR	66.3%	7.0%	6.9%	19.8%
19	Salt Lake City	SLC	68.0%	12.0%	6.7%	13.4%
20	Philadelphia	PHL	69.1%	8.6%	7.3%	15.0%
21	Baltimore	BWI	70.6%	7.8%	7.5%	14.1%
22	Minneapolis	MSP	70.1%	6.9%	6.5%	16.4%
23	Detroit	DTW	71.4%	9.1%	7.0%	12.5%
24	Washington Dulles	IAD	73.7%	7.6%	6.5%	12.2%
25	Houston Intercontinental	IAH	77.1%	7.7%	7.7%	7.5%
26	Atlanta	ATL	78.3%	11.5%	3.6%	6.6%
27	Miami	MIA	81.1%	12.7%	5.1%	1.1%
28	Dallas/Fort Worth	DFW	84.6%	5.2%	4.2%	6.1%
29	Charlotte	CLT	90.2%	4.0%	2.5%	3.4%
30	Chicago Midway	MDW	95.5%	4.1%	0.2%	0.2%
	<b>Average Large Hub</b>		<b>56.3%</b>	<b>15.9%</b>	<b>9.5%</b>	<b>18.3%</b>

Note: Ranked in ascending order by largest air carrier market share. Includes only airports in the continental United States. July 2017 is using advance schedules.  
Source: Innovata Schedules, July 2017.

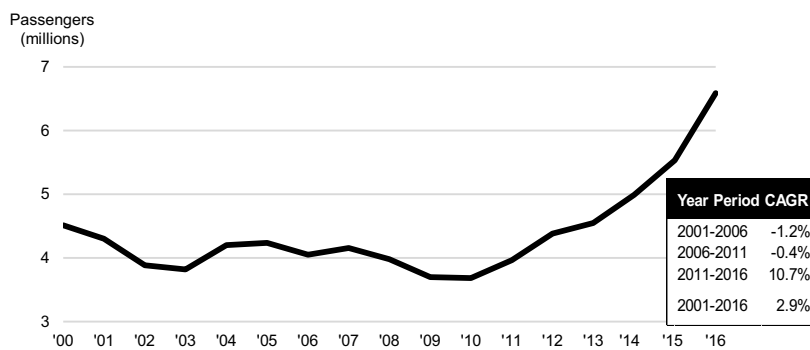
The changing airline market shares at Logan over time highlight the contestability of the Boston market. Since 1990, the leading carrier position at Logan Airport has changed various times between Delta, US Airways, American and JetBlue. JetBlue became the leading carrier in domestic seats at the Airport in 2010 and has maintained this position every year since. Delta was surpassed by the merged American/US Airways as well starting in 2013, but has continued to increase capacity in recent years whereas American is reducing capacity. The continual shifting balance of service among top carriers at the Airport reflects the very active and competitive dynamics in the Boston market.



4.3.2 International Passengers

International passenger traffic at Logan has exhibited strong growth over the past several years, reaching a new peak of 6.6 million passengers in 2016 (See Exhibit 2-15). Over a five year period, international passengers at the airport grew at an average annual rate of 10.7 percent. In 2016, the number of international passengers was 44.9 percent greater than the number in 2013. This growth has been driven by the expansion of JetBlue and Delta international service at Boston, as well as a rapid increase in foreign carrier service in recent years. Since 2011, JetBlue has continued to expand its Caribbean network from Logan, while Delta has added nonstop service to London Heathrow, Paris De Gaulle and Dublin. Logan has also attracted significant new foreign carrier service including Japan Airlines, Avianca, Copa Airlines, Emirates, Turkish Airlines, Hainan Airlines, WOW Air, Norwegian Air Shuttle, SAS, Tap-Portugal, and Cathay Pacific. As of July 2017, 33 U.S. and foreign airlines provide scheduled service from Logan to 54 year-round and seasonal international destinations.<sup>58</sup>

**Exhibit 4-15: Historical International Passenger Traffic at Boston Logan Airport (CY 2000 to CY 2016)**

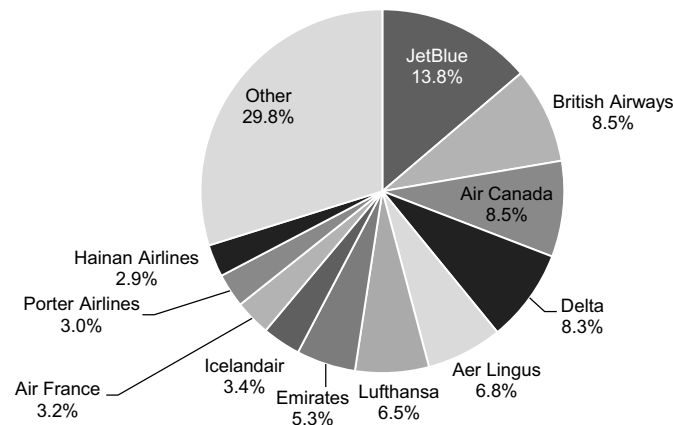


Note: Excludes general aviation passengers.  
Source: Massport.

In CY 2016, in terms of international passengers, JetBlue was the leading international carrier, carrying 13.8 percent of Logan’s international passengers (Exhibit 4-16). British Airways, which offers four daily departures to London Heathrow, was the second largest international carrier with an 8.5 percent share, followed by Air Canada with an 8.5 percent share. Foreign flag carriers have a dominant share of the international passenger market at Logan, accounting for approximately 77 percent of the Airport’s international passengers in CY 2016.

<sup>58</sup> Source: Innovata, July 2017.

**Exhibit 4-16: Airline Market Share for International Passengers (CY 2016)**



Note: Regional airline passengers are grouped with their mainline carrier partners. Excludes general aviation passengers.  
Source: Massport.

Boston is currently the 10<sup>th</sup> largest U.S. gateway for international air travel, as shown in Exhibit 4-17 below. International traffic at the Airport has shown very strong growth over the past year, with Boston moving up in rank from the 12<sup>th</sup> largest international gateway as of YE 3Q 2015. Logan Airport is also the largest U.S. gateway airport that is not also a U.S. airline connecting hub.

**Exhibit 4-17: Top U.S. Gateways for International Traffic (CY 2011 to YE 3Q 2016)**

YE 3Q 2016 Rank	US Gateway	Hub	Total Passengers		YE 3Q 2016	CAGR
			CY 2011	YE 3Q 2016	Pct. Share	'11-YE 3Q 2016
1	New York	✓	35,726,422	44,710,556	21.3%	4.8%
2	Los Angeles	✓	16,276,204	21,831,000	10.4%	6.4%
3	Miami	✓	17,572,540	19,862,805	9.5%	2.6%
4	Chicago	✓	10,614,065	12,577,666	6.0%	3.6%
5	San Francisco	✓	8,674,499	11,833,591	5.6%	6.8%
6	Houston	✓	8,458,410	11,349,873	5.4%	6.4%
7	Atlanta	✓	9,355,385	11,196,975	5.3%	3.9%
8	Dallas/Fort Worth	✓	5,216,852	7,770,229	3.7%	8.7%
9	Washington	✓	6,598,694	7,462,935	3.6%	2.6%
<b>10</b>	<b>Boston</b>		<b>3,899,372</b>	<b>5,897,080</b>	<b>2.8%</b>	<b>9.1%</b>
11	Fort Lauderdale		3,413,375	5,542,423	2.6%	10.7%
12	Orlando		3,304,623	5,429,114	2.6%	11.0%
13	Honolulu		3,845,910	5,069,535	2.4%	6.0%
14	Seattle/Tacoma	✓	2,848,449	4,540,227	2.2%	10.3%
15	Philadelphia		3,848,084	3,802,603	1.8%	-0.2%
<b>Sub Total: Top 15</b>			<b>139,652,884</b>	<b>178,876,612</b>	<b>85.2%</b>	<b>5.3%</b>
Other			24,391,634	31,106,405	14.8%	5.3%
<b>Grand Total</b>			<b>164,044,518</b>	<b>209,983,017</b>	<b>100.0%</b>	<b>5.3%</b>

Source: U.S. DOT, T100 Database via Database Products.

Historically, the growth of international services has been heavily concentrated at major airline connecting hubs in the U.S. (e.g., Atlanta, Chicago O’Hare, Dallas/Ft. Worth, Houston and Washington Dulles), as a hub carrier’s connecting network was often needed to generate sufficient passenger traffic to fill the large widebody aircraft used on international flights. However, the O&D strength of the Boston market makes Logan an attractive gateway for foreign flag airlines despite Logan’s lack of a network carrier hub. In recent years, JetBlue has shown a willingness to develop interline and codeshare relationships with foreign airlines, increasing the connectivity potential at Logan. In addition, trends in new aircraft technology have also allowed

for use of smaller and more fuel-efficient aircraft on international routes, benefitting medium sized O&D markets like Boston. As shown in Exhibit 4-18, next generation aircraft such as the Boeing 787 and Airbus A350 currently account for a combined 16 percent of Logan's long haul international seats in July 2017, up from just 3 percent in July 2013.

**Exhibit 4-18: International Weekly Departing Seat Share by Aircraft  
(July 2013 – July 2017)**

	Weekly Seat Share							
	2006	2011	2012	2013	2014	2015	2016	2017
A330	17.9%	17.5%	19.9%	30.2%	25.7%	21.1%	30.9%	34.2%
B777	12.6%	4.0%	4.1%	12.2%	10.2%	10.5%	16.4%	16.7%
B787	0.0%	0.0%	2.8%	2.8%	4.7%	6.3%	8.1%	11.1%
B757	10.4%	22.7%	18.0%	13.7%	12.5%	8.3%	6.9%	9.5%
B747	17.2%	24.4%	21.7%	16.9%	25.8%	23.9%	12.7%	6.1%
A350	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.3%	5.1%
A380	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.0%
Other	42.0%	31.4%	33.4%	24.2%	21.1%	29.9%	22.7%	15.3%

Note: Excludes Caribbean and Canada destinations  
Sources: Innovata Schedules.

Recent developments in international air service at Logan are discussed further in Section 4.4.

#### 4.3.3 Logan Top O&D Markets

The top 15 domestic O&D markets (as shown in Exhibit 4-19) accounted for approximately 53 percent of Boston's total domestic O&D passengers for CY 2016.

**Exhibit 4-19: Top Boston Domestic O&D Passenger Markets  
(CY 2016)**

Rank	City	Nonstop Miles	O&D Psgrs	Percent of Total	5-Year CAGR	Sched Daily Nonstop Depts	No. of Carriers Serving
1	Chicago	864	1,543,253	5.9%	6.0%	27	5
2	New York	187	1,498,132	5.7%	3.1%	59	4
3	Washington	412	1,476,765	5.6%	0.5%	30	3
4	San Francisco	2,697	1,215,230	4.6%	4.5%	16	4
5	Los Angeles	2,605	1,190,508	4.5%	6.2%	15	5
6	Orlando	1,122	927,286	3.5%	-0.1%	12	3
7	Atlanta	946	865,325	3.3%	4.3%	19	4
8	Baltimore	369	799,887	3.0%	0.4%	17	3
9	Dallas/Fort Worth	1,559	744,615	2.8%	10.7%	12	4
10	Philadelphia	280	736,064	2.8%	2.3%	15	2
11	Fort Lauderdale	1,239	717,809	2.7%	0.5%	8	3
12	Denver	1,749	673,951	2.6%	4.3%	9	3
13	Fort Myers	1,251	547,967	2.1%	3.6%	3	2
14	Houston	1,595	543,797	2.1%	12.3%	8	3
15	Raleigh/Durham	612	509,394	1.9%	4.7%	10	2
<b>Subtotal Top 15</b>			<b>13,989,983</b>	<b>53.2%</b>		<b>259</b>	
All Other			12,330,709	46.8%		234	
<b>Grand Total</b>			<b>26,320,692</b>	<b>100.0%</b>		<b>493</b>	

Note: New York includes JFK, LaGuardia and Newark airports. Washington includes Reagan National and Dulles airports. Houston includes Hobby and George Bush Intercontinental airports. Dallas includes Love Field and Dallas/Ft. Worth airports. Chicago includes Midway and O'Hare airports. Totals may not add up due to rounding.

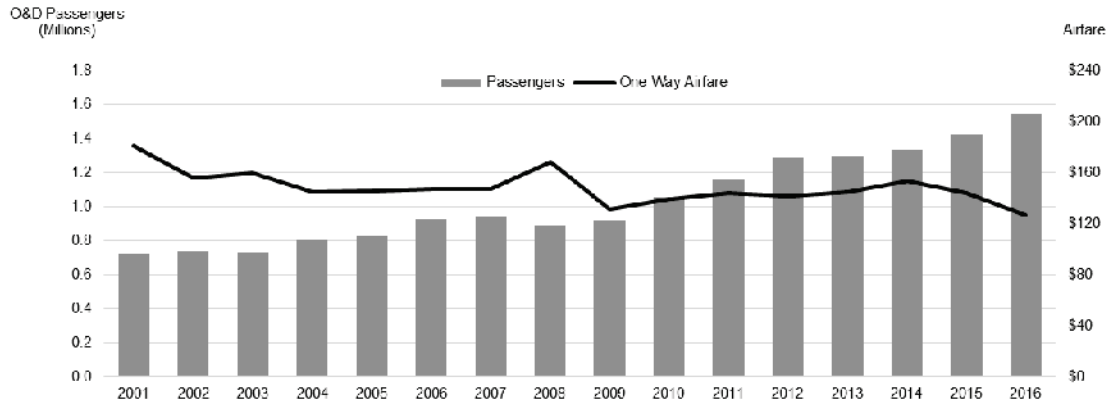
Discrepancies between the figures in Exhibit 4-19 and Appendix A to the Official Statement to which this report is attached are due to proprietary data processing methods used by Database Products (which is the source used in Exhibit 4-19) and Diio (which is the source used in Appendix A) to scale-up the U.S. DOT O&D Survey data, which is a 10 percent sample.

Sources: U.S. DOT, O&D Survey via Database Products, CY 2016; Innovata Schedules, July 2017.

The Chicago market, which includes traffic to O'Hare and Midway, is currently Boston's largest O&D market. Boston-Chicago O&D has shown strong growth since 2009, reaching over 1.54 million annual passengers in CY 2016 (Exhibit 4-20). Airlines serving the Boston-Chicago market include American, United, JetBlue, and Spirit Airlines service to O'Hare; and Southwest service to Midway. Demand in the Boston-Chicago market has

steadily increased since 2001, with an absolute increase of over 100 percent, from 720,000 to 1.54 million annual O&D passengers. The average fare has decreased substantially since 2001, from \$181 to \$126 in 2016, a 30 percent decrease in fare cost. Despite substantial decreases in passengers in other large O&D markets like New York, passenger levels to Chicago remained fairly flat during the global economic downturn and credit crisis, and have steadily risen since 2009, growing on average 7.9 percent between 2009 and 2016. Over that time period, average fares have decreased 0.5 percent.

**Exhibit 4-20: Passengers and Average Fares in the Boston - Chicago Market  
(CY 2001 to CY 2016)**

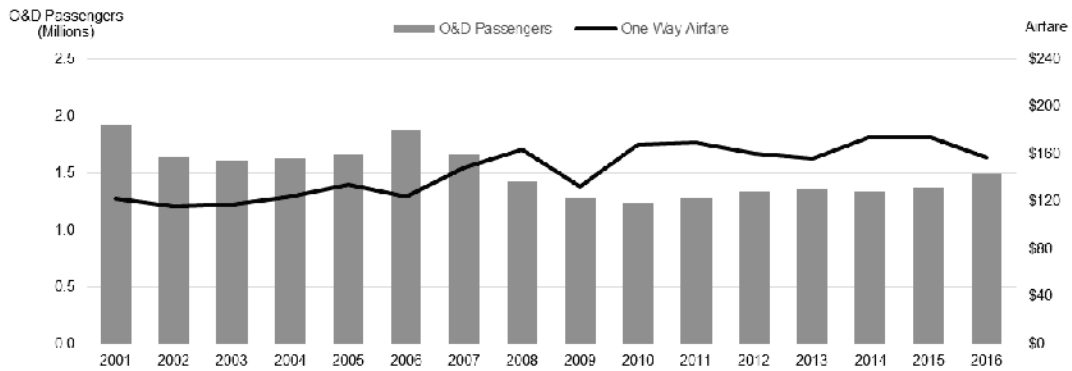


Source: U.S. DOT, O&D Survey.

The New York market, which includes traffic to LaGuardia, JFK and Newark, is now Boston’s second largest O&D market. For CY 2016, there were 1.50 million passengers in the Boston-New York market (Exhibit 4-21). In December 2011, JetBlue obtained eight additional slot pairs at New York LaGuardia Airport through an FAA slot auction, which solidified its presence at the airport. Airlines currently serving the Boston-New York market include the shuttle services offered by Delta, American and JetBlue to LaGuardia Airport;<sup>59</sup> JetBlue, American and Delta services to JFK; and JetBlue and United services to Newark.

<sup>59</sup> JetBlue began service to New York LGA in October 2016.

**Exhibit 4-21: Passengers and Average Fares in the Boston - New York Market  
(CY 2000 to CY 2016)**



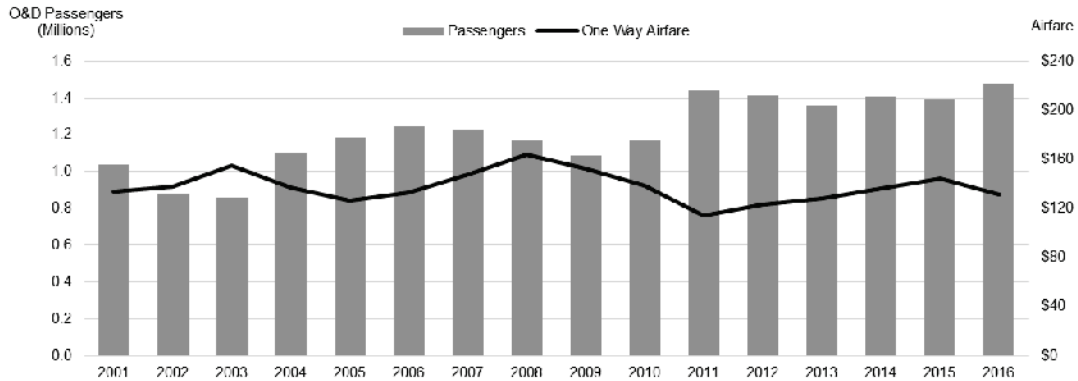
Source: U.S. DOT, O&D Survey via Database Products.

Demand in the Boston-New York market has fallen by approximately 21.8 percent from 1.9 million O&D passengers in 2001, while the average fare has increased by 27.6 percent from \$123 in CY 2001 to \$157 in CY 2016. Several factors coalesced over this period to lower Boston-New York air passenger demand, including the availability of competitive rail and bus modes. Amtrak introduced high-speed Acela Express service along the Northeast Corridor in December 2000,<sup>60</sup> and frequent low-cost bus services emerged as attractive alternatives to air travel. Greater levels of airline passenger security screening after 9/11 also decreased the relative attractiveness of air travel in short-haul markets, like Boston-New York. Demand declined further during the global economic downturn and credit crisis, which weakened business travel demand. Since 2009, passenger levels have stabilized at around 1.3 million, while average fares have fluctuated between \$174 and \$156 in the last three years. The New York-Washington, DC market has been similarly affected by these trends.

Washington DC is Boston’s third largest O&D market, having surpassed New York in 2011 following JetBlue’s initiation of frequent nonstop services between Logan and Washington Reagan National Airport in November 2010. The stimulating effect of JetBlue’s frequent, low-fare Boston-Washington Reagan National service is shown in Exhibit 4-22. From 2009, the year before JetBlue’s Boston-Washington Reagan National service, to 2011, O&D passengers increased by 32.8 percent and the average fare fell by 25.2 percent. For CY 2016, there were 1.48 million Boston-Washington, DC O&D passengers, compared to 857,000 in 2003.

<sup>60</sup> In addition to the Acela Express service that is operated with high-speed trains, Amtrak also provides regional service with conventional train sets.

**Exhibit 4-22: Passengers and Average Fares in the Boston–Washington, DC Market (CY 2001 to CY 2016)**



Source: U.S. DOT, O&D Survey via Database Products.

The geographic distribution of Boston passenger demand has continued to evolve. As shown in Exhibit 4-23, the Southeast, which is dominated by the Florida markets, is currently the leading destination region for Boston O&D passengers, accounting for 28 percent of domestic O&D passengers. The Mid-Atlantic region has declined and now represents 21 percent of domestic demand compared to 25 percent in 2006. The Southwest region is the fastest growing destination region, but only accounts for 9 percent of domestic O&D passengers. New England O&D passengers have declined from over 406,000 in 1991 to approximately 151,000 passengers in CY 2016.

**Exhibit 4-23: Boston Logan Airport Domestic O&D Passengers by Region (CY 2006, CY 2011 and CY 2016)**

Region	O&D Passengers			% of BOS Market Share			CAGR '06-'16
	CY2006	CY2011	CY2016	CY2006	CY2011	CY2016	
Southeast	5,901,805	6,020,305	7,295,389	29%	28%	28%	2.1%
Mid Atlantic	5,267,768	5,332,053	5,615,703	25%	25%	21%	0.6%
Pacific	3,680,507	3,870,666	4,952,817	18%	18%	19%	3.0%
Great Lakes	2,364,876	2,506,304	3,378,102	11%	12%	13%	3.6%
Southwest	1,413,075	1,613,115	2,368,730	7%	7%	9%	5.3%
Mountain	744,142	836,937	1,107,661	4%	4%	4%	4.1%
Midwest	823,015	865,595	1,033,681	4%	4%	4%	2.3%
US Territories	346,912	401,889	417,406	2%	2%	2%	1.9%
New England	164,968	130,073	151,203	1%	1%	1%	-0.9%
<b>Total</b>	<b>20,707,068</b>	<b>21,576,937</b>	<b>26,320,692</b>				<b>2.4%</b>

Note: Southeast includes AL, LA, MS, GA, NC, TN, FL, SC, and AR  
 Source: U.S. DOT, O&D Survey via Database Products.

#### 4.4 Scheduled Airline Service

Airline service and aircraft operation at Logan can be grouped into three major market segments: domestic large jet, domestic regional and international. Domestic large jet service includes all domestic services operated by aircraft of 90 or more seats, including the Embraer EMB-190 aircraft operated by JetBlue. Domestic regional service includes domestic services operated by smaller regional jets of less than 90 seats. The domestic large jet and international segments have principally served O&D passengers, while domestic regional carrier services historically operated as feeder flights carrying passengers from small New England and upstate New York markets to Logan Airport for connecting services to other destinations.

4.4.1 Domestic Large Jet Service

Nine U.S. airlines provide scheduled domestic large jet services at Logan as of July 2017 (Exhibit 4-24). Logan is served by all major U.S. carriers with revenues over \$1 billion, with the exception of Hawaiian Airlines and Frontier. Logan’s current nonstop domestic jet service is illustrated in Exhibit 4-23.

**Exhibit 4-24: U.S. Large Jet Carriers Serving Logan  
(As of July 2017)**

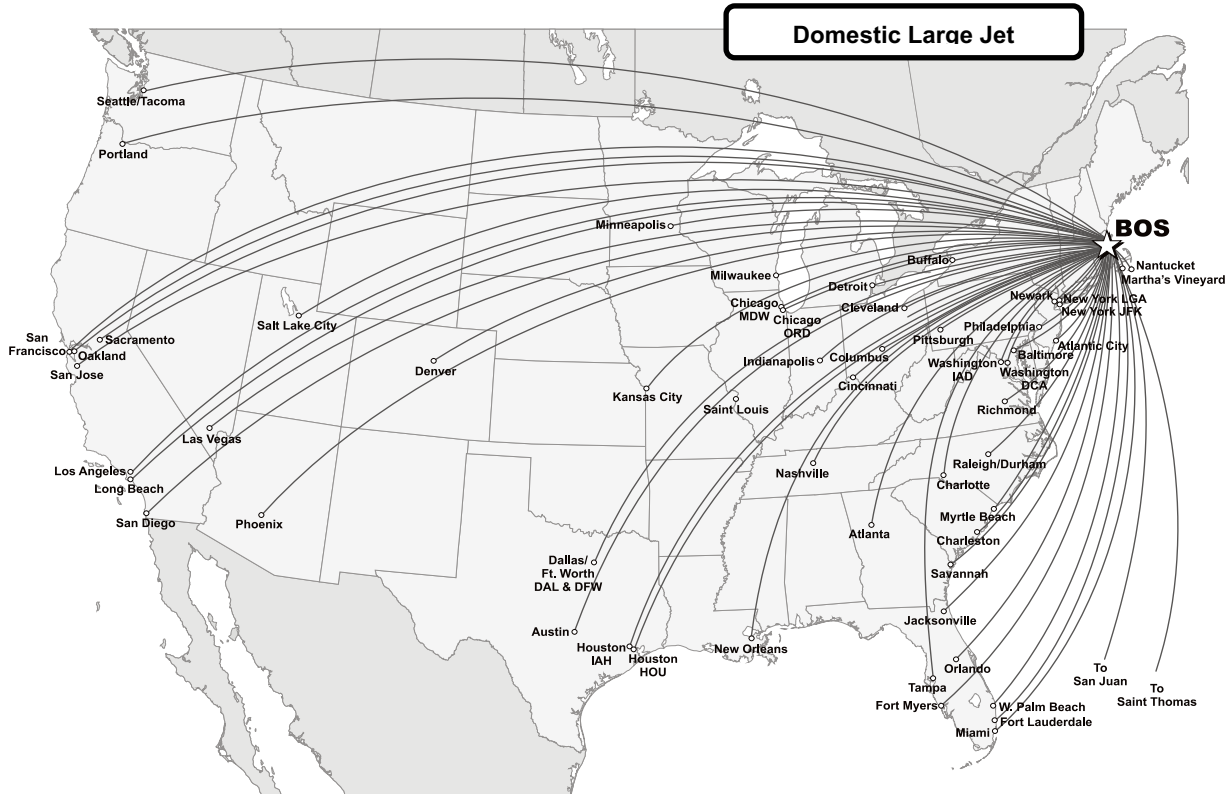
US Large Jets	
Alaska Airlines	Spirit Airlines
American Airlines	Sun Country*
Delta Airlines	United Airlines
JetBlue Airlines	Virgin America
Southwest Airlines	

\* Sun Country is a hybrid charter-LCC carrier that operates mostly leisure routes seasonally.

Notes: The merger between Alaska Airlines and Virgin America was approved by the U.S. Department of Justice in December 2016.

Source: Innovata Schedules

**Exhibit 4-25: Domestic Nonstop Large Jet Markets Served from Boston Logan  
(July 2017)**



Source: Innovata Schedules.

Changes in Logan’s scheduled domestic airline services by the network carriers and LCCs over the past year are shown in Exhibit 4-26. Domestic large jet services increased slightly in 2016 by five daily departures. In 2017, JetBlue is expected to increase frequencies in markets such as New York - LGA, Orlando and Pittsburgh, as well as launch service to Atlanta. Overall, JetBlue is expected to add 11 average daily departures in 2017, the most of any carrier. Delta accounts for the second largest increase, adding two daily frequencies to each of the Orlando, San Francisco, and Tampa markets. In addition, Delta announced new nonstop service to Austin, Texas; Kansas City, Missouri; Jacksonville, Florida; Buffalo, New York and Norfolk,

Virginia beginning September 2017.<sup>61</sup> Southwest and ULCC Spirit Airlines are the third fastest growing carriers, each adding one average daily frequency from Logan. American is expected to decrease nonstop daily departures, specifically from Boston to Washington National, while United is expected to decrease nonstop daily departures to New York – Newark and San Francisco.

**Exhibit 4-26: Scheduled Large Jet Domestic Airline Service at Logan  
(July 2016 to July 2017)**

Reporting Carrier	Nonstop Daily Departures		Change ('16 - '17)	
	July '16	July '17	Net Change	% Change
Alaska	5	5	0	0%
American Airlines	82	74	-8	-10%
Delta	44	46	2	6%
JetBlue	128	139	11	9%
Southwest	37	38	1	4%
Spirit Airlines	13	14	1	8%
Sun Country	3	3	0	0%
United	39	37	-2	-5%
Virgin America	6	6	0	2%
<b>Total</b>	<b>357</b>	<b>362</b>	<b>5</b>	<b>1%</b>

Notes: JetBlue and American mainline departures include operations with the Embraer-190 large regional jet.  
Source: Innovata Schedules.

**4.4.2 Regional Domestic Service**

Nine U.S. regional carriers provide domestic passenger services at Logan Airport as of July 2017 (see Exhibit 4-27). The majority of U.S. regional carriers serving Logan are either wholly owned by a network carrier or operate under joint marketing agreements with network carriers. Four regional airlines, Air Wisconsin, ExpressJet, Republic Airways, and GoJet, operate for more than one network carrier. The domestic services provided by these regional carriers are shown in Exhibit 4-28.

**Exhibit 4-27: Domestic Regional Airlines (and Affiliates) Operating at Logan  
(July 2017)**

Independent
Cape Air
PenAir

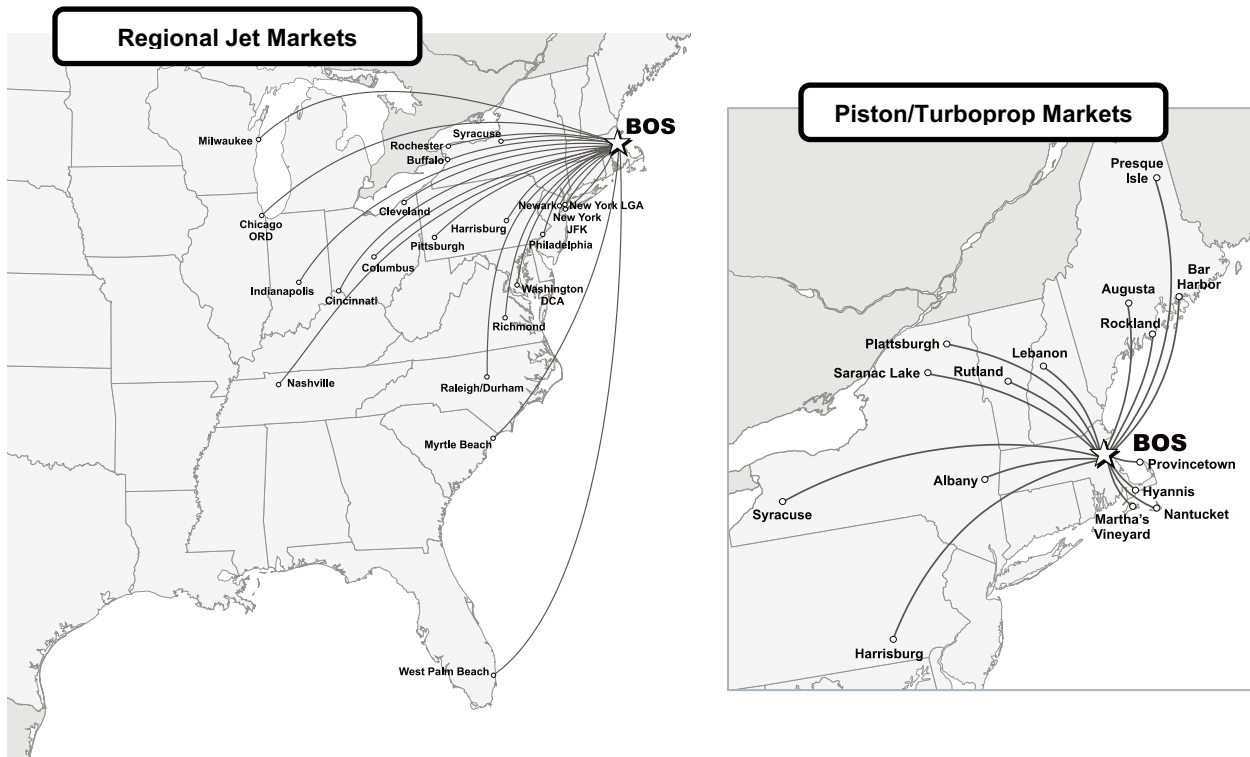
Affiliated
Air Wisconsin (American Eagle)
Endeavor Air (Delta Connection)
ExpressJet (Delta Connection and United Express)
GoJet (Delta Connection)
Piedmont Airlines (American Eagle)
Republic Airlines (American Eagle and United Express)
SkyWest Airlines (Delta Connection and United Express)

Note: Regional carriers providing domestic service only. Cape Air includes Hyannis Air. Endeavor Air was previously named Pinnacle Air. Air Wisconsin signed a five-year contract with United Airlines to fly as a United Express Carrier in February 2017. Shuttle America ceased operations and merged with Republic Airlines in February 2017.  
Source: Innovata Schedules.

<sup>61</sup> Flights to Kansas City, Missouri; Jacksonville, Florida; Buffalo, New York and Norfolk, Virginia are flown by regional jets.



**Exhibit 4-28: Regional Carrier Domestic Nonstop Markets Served from Logan  
(July 2017)**



Note: Essential Air Service (EAS) markets from Logan Airport will include Augusta (ME), Bar Harbor (ME), Presque Isle (ME), Rockland (ME), Lebanon (NH), Plattsburgh (NY), Ogdensburg (NY), Saranac Lake (NY), and Rutland (VT).  
Source: U.S. Department of Transportation; Innovata Schedules

Small regional jet services grew rapidly at Logan Airport at the beginning of the 2000s, when airlines deployed RJs to replace smaller turboprop aircraft and to compete with other airlines on short-haul high-density routes. Since the run-up in fuel prices in 2007, airlines have eliminated large numbers of smaller regional jets from their fleets because of high per seat operating costs. Between 2010 and 2016, the share of total RJ departures at Logan continued to decline sharply (see Exhibit 4-29). Current low fuel prices, however, have resulted in some airlines increasing the use of RJs on select routes. RJ activity at Logan is scheduled to increase from 37 daily departures in July 2016 to 46 daily departures in July 2017. RJ operations in July 2017 remain 38 percent below 2010 levels.

In 2017, Cape Air will reduce services to Nantucket, Hyannis, Martha's Vineyard, Provincetown, and Rutland. Non-jet frequencies will decrease by twenty percent in July 2017, compared to 2016.

**Exhibit 4-29: Scheduled Regional Domestic Airline Service at Logan  
(July 2010 to July 2017)**

Reporting Carrier	Nonstop Daily Departures								Change ('10 - '17)		Change ('16 - '17)	
	'10	'11	'12	'13	'14	'15	'16	'17	Net Change	% Change	Net Change	% Change
<b>Regional Jets</b>												
American Airlines	37	25	15	14	14	15	8	11	-26	-71%	3	30%
Delta	24	35	29	28	31	27	25	31	7	24%	6	20%
Frontier Airlines	0	1	0	0	0	0	0	0	0	0%	0	0%
United	9	7	7	8	9	6	4	4	-5	-60%	0	0%
Republic Airlines	2	0	0	0	0	0	0	0	-2	-100%	0	0%
<b>Subtotal</b>	<b>73</b>	<b>68</b>	<b>51</b>	<b>49</b>	<b>54</b>	<b>47</b>	<b>37</b>	<b>46</b>	<b>-27</b>	<b>-38%</b>	<b>9</b>	<b>20%</b>
<b>Turboprops/Pistons</b>												
Cape Air	63	72	71	70	69	75	74	61	-2	-5%	-13	-20%
American Airlines	18	15	4	3	3	1	1	0	-18	-100%	-1	-100%
PenAir	0	0	8	7	7	7	6	6	6	0%	0	-10%
Other	2	1	2	0	0	0	5	0	-3	-100%	-5	-100%
<b>Subtotal</b>	<b>83</b>	<b>89</b>	<b>84</b>	<b>81</b>	<b>79</b>	<b>83</b>	<b>86</b>	<b>67</b>	<b>-16</b>	<b>-19%</b>	<b>-19</b>	<b>-20%</b>
<b>Total Daily Departures</b>	<b>156</b>	<b>157</b>	<b>135</b>	<b>130</b>	<b>133</b>	<b>130</b>	<b>123</b>	<b>113</b>	<b>-43</b>	<b>-28%</b>	<b>-10</b>	<b>-10%</b>

Note: July 2017 is using advance schedules.  
Source: Innovata Schedules.

4.4.3 International Service

Three U.S. and 30 foreign flag airlines will provide scheduled services from Logan Airport to international destinations as of July 2017 (Exhibit 4-30). The three major global airline alliance groups – Oneworld, SkyTeam and Star – are represented at Logan Airport by multiple carriers. Exhibit 4-31 shows the international markets served nonstop from Logan in July 2017.

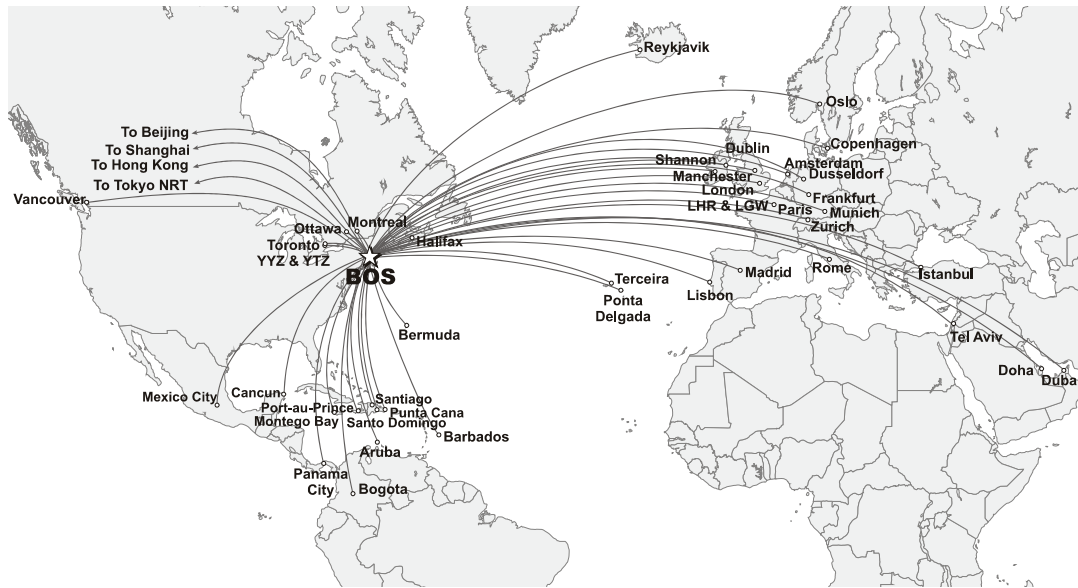
**Exhibit 4-30: U.S. and Foreign Carriers Providing International Service at Logan International Airport  
(July 2017)**

US Flag Airlines
American Airlines (Oneworld)
Delta Airlines (SkyTeam)
JetBlue Airlines

Foreign Flag Airlines	
Aer Lingus	Icelandair
Aeroméxico (SkyTeam)	Japan Airlines (Oneworld)
Air Berlin (Oneworld)	Lufthansa (Star)
Air Canada (Star)*	Norwegian Air Shuttle
Air Europa (SkyTeam)	Porter Airlines
Air France (SkyTeam)	Qatar Airlines (Oneworld)
Alitalia (SkyTeam)	SATA
Avianca (Star)	Scandinavian (Star)
British Airways (Oneworld)	SWISS (Star)
Cathay Pacific (Oneworld)	TAP-Portugal (Star)
Copa Airlines (Star)	Thomas Cook Airlines
EI AI	Turkish Airlines (Star)
Emirates	Virgin Atlantic Airways
Hainan Airlines	WestJet
Iberia (Oneworld)	WOW Air

\*Includes regional carriers Jazz Air and Sky Regional Airlines, both of which operate at Logan as part of Air Canada Express.  
Note: Excludes U.S. regional airline affiliates serving the U.S. and Canada.  
Source: Innovata Schedules.

**Exhibit 4-31: Nonstop International Service from Logan  
(July 2017)**



Note: The following are operated on a seasonal basis: Bogota (June-December), Dusseldorf (May-December), Fort De France (November-March), Grand Cayman (November-April), Liberia (November-April), Madrid (May-December), Manchester (April-October), Nassau (November-June), Oslo (April-October), Providenciales (November-May), Port Au Prince (June-December), Pointe-A-Pitre (November-March), Puerto Plata (November-April), Saint Lucia (November-April), Saint Maarten (September-June)  
Source: Innovata Schedules

Exhibit 4-32 below shows international carrier service changes at Logan from July 2016 to July 2017. Logan has seen a significant expansion of international services in recent years.

Overall, international service levels at Logan increased by approximately four percent from 524 weekly departures in July 2016 to 546 weekly departures in July 2017. Much of the growth in international services over the past few years is due to the entry of new carriers and the implementation of frequency increases by existing carriers (see Section 4.4.4.2 herein). Delta is expected to increase their nonstop daily departures in July 2017 with new Caribbean services and service to Dublin, which began in May 2017.

**Exhibit 4-32: Scheduled International Service at Logan International Airport  
(July 2016 to July 2017)**

Reporting Carrier	Weekly Dep.		Change ('16 - '17)		Reporting Carrier	Weekly Dep.		Change ('16 - '17)	
	July '16	July '17	Net Change	% Change		July '16	July '17	Net Change	% Change
<b>Jets</b>									
Aer Lingus	21	21	0	0%	SAS	7	7	0	0%
Aeromexico	6	7	1	15%	SATA Internacional	9	13	4	41%
Air Berlin	4	7	3	72%	SWISS	14	13	-1	-6%
Air Canada	34	58	24	72%	TAP Portugal	7	7	0	0%
Air Europa	-	3	3	N/A	Thomas Cook	2	3	1	67%
Air France	14	13	-1	-5%	Turkish Airlines	7	7	0	0%
Alitalia	7	7	0	0%	Virgin Atlantic Airways	7	8	1	13%
American Airlines	9	9	0	0%	WOW air	7	7	0	0%
AVIANCA	-	4	4	N/A					
British Airways	28	25	-3	-11%	<b>Subtotal</b>	<b>367</b>	<b>413</b>	<b>46</b>	<b>7%</b>
Cathay Pacific Airways	5	7	2	41%	<b>Regional Jets</b>				
Copa Airlines	7	7	0	0%	Air Canada	86	61	-25	-29%
Delta	36	47	11	29%	<b>Subtotal</b>	<b>86</b>	<b>61</b>	<b>-25</b>	<b>-29%</b>
El Al Israel Airlines	3	3	0	0%	<b>Turboprops/Pistons</b>				
Emirates Airlines	14	7	-7	-50%	Porter Airlines	43	44	0	1%
Eurowings	3	-	-3	-100%	WestJet	28	28	0	0%
Hainan Airlines	10	10	0	0%	<b>Subtotal</b>	<b>71</b>	<b>72</b>	<b>0</b>	<b>1%</b>
Iberia	7	7	0	0%	<b>Total Weekly Departures</b>				
Icelandair	21	21	0	0%	<b>524</b>	<b>546</b>	<b>22</b>	<b>4%</b>	
Japan Airlines	7	7	0	0%					
JetBlue	36	42	6	17%					
Lufthansa German Airlines	21	21	0	0%					
Norwegian Air Shuttle	7	7	0	0%					
Qatar Airways	6	7	1	15%					

Note: Air Canada includes Air Canada Express. July 2017 is using advance schedules.  
Source: Innovata Schedules.

Logan's international services remain heavily oriented toward European destinations, making Boston the 7<sup>th</sup> busiest U.S. gateway for transatlantic air travel for the 12 months ended September 2016 (Exhibit 4-33). The Airport has increased in rank from the 8<sup>th</sup> busiest U.S. gateway for transatlantic traffic in CY 2015, given the introduction of several new international services in 2016. In July 2017, services to Europe are scheduled to account for 240 weekly departures and 58.3 percent of total international seat capacity at Logan Airport.

**Exhibit 4-33: Top U.S. Gateways for Transatlantic Passengers  
(YE 3Q 2016)<sup>62</sup>**

Psg. Rank	US Gateway	Total Psgrs. YE 3Q 16	Percent Share	CAGR 2011-YE 3Q 16	Psg. Rank	US Gateway	Total Psgrs. YE 3Q 16	Percent Share	CAGR 2011-YE 3Q 16
1	New York	23,298,906	32.6%	3.0%	9	Houston	2,217,071	3.1%	2.5%
2	Chicago	5,478,249	7.7%	2.6%	10	Philadelphia	2,202,426	3.1%	-1.7%
3	Los Angeles	5,155,362	7.2%	8.0%	11	Orlando	1,940,297	2.7%	8.6%
4	Washington	4,858,281	6.8%	0.9%	12	Dallas/Fort Worth	1,634,523	2.3%	8.2%
5	Atlanta	4,045,770	5.7%	1.6%	13	Detroit	1,488,481	2.1%	3.3%
6	Miami	4,028,052	5.6%	7.4%	14	Seattle/Tacoma	1,472,813	2.1%	14.2%
7	<b>Boston</b>	<b>3,938,416</b>	<b>5.5%</b>	<b>6.8%</b>	15	Minneapolis	959,133	1.3%	5.8%
8	San Francisco	3,785,480	5.3%	8.4%					
	<b>Sub Total: Top 15</b>	<b>66,503,260</b>	<b>93.1%</b>						
	Other	4,892,381	6.9%						
	<b>Grand Total</b>	<b>71,395,641</b>	<b>100.0%</b>						

Note: includes Atlantic international services only (Africa, Europe, and Middle East).  
Source: U.S. DOT, T100 Database via Database Products.

<sup>62</sup> The U.S. DOT has not yet released international T100 data for CY 2016

#### 4.4.4 Significant Air Service Trends

The expansion of service by LCCs and international carriers has driven the majority of passenger and capacity growth at Logan, further solidifying the Airport's dominance in the New England market. An LCC (JetBlue) is the largest carrier at the Airport in terms of seats and 30 international carriers now serve the Airport. These major trends will be further discussed in the sections below.

##### 4.4.4.1 Low Cost Carrier (LCC) Development

Logan Airport currently is serviced by five domestic LCCs: JetBlue, Southwest, Spirit Airlines, Sun Country and Virgin America. In addition to these domestic low cost carriers, Logan also is serviced by five international LCCs, including Air Berlin, Norwegian Air Shuttle, Thomas Cook Airlines,<sup>63</sup> WestJet and WOW Air.

Since entering the Boston market in 2004, JetBlue has grown to become Logan's largest carrier, offering 1,017 weekly departures to 55 destinations for the summer 2017 season (Exhibit 4-34). JetBlue has significantly broadened its network at Boston to include transcontinental flights, business destinations and flights to the Caribbean in addition to its traditional Florida destinations. Short-haul destinations along the busy northeast corridor now account for roughly 23 percent of JetBlue's flights from Logan, and Florida markets represent approximately 18 percent of JetBlue's flights, down from 24 percent seven years ago. Approximately 48 percent of JetBlue's services are to other domestic medium- and long-haul markets. JetBlue also offers extensive services to the Caribbean and Central America, which accounts for 42 weekly flights or 4.1 percent of the carrier's July 2017 scheduled flights.

**Exhibit 4-34: Change in Low Cost Carrier Share of Weekly Departures and Seats at Logan  
(July 2015 to July 2017)**

Carrier	2015			2016			2017		
	Depts.	Seats	Seat Share	Depts.	Seats	Seat Share	Depts.	Seats	Seat Share
JetBlue	879	106,231	65.6%	930	114,271	62.4%	1,017	125,938	63.6%
Southwest	252	36,675	22.6%	259	38,593	21.1%	269	40,301	20.4%
Spirit Airlines	56	8,351	5.2%	91	14,119	7.7%	98	15,967	8.1%
Virgin America	45	6,514	4.0%	45	6,617	3.6%	45	6,717	3.4%
Sun Country	20	2,980	1.8%	20	2,928	1.6%	20	2,988	1.5%
Norwegian Air Shuttle	-	-	-	7	2,064	1.1%	7	2,450	1.2%
WestJet	-	-	-	28	2,184	1.2%	28	2,184	1.1%
WOW air	6	1,219	0.8%	7	1,400	0.8%	7	1,400	0.7%
Eurowings	0	0	0.0%	3	977	0.5%	0	0	0.0%
<b>Total</b>	<b>1,259</b>	<b>161,970</b>	<b>100.0%</b>	<b>1,389</b>	<b>183,153</b>	<b>100.0%</b>	<b>1,492</b>	<b>197,946</b>	<b>100.0%</b>

Note: Includes weekly scheduled departures and seats to domestic, Caribbean and Mexican destinations.  
Source: Innovata Schedules, July 2016 to July 2017.

JetBlue has entered into more than 35 marketing partnerships with other U.S. and foreign airlines. These partnerships are primarily structured as interline agreements that allow passengers to book one itinerary on multiple carriers. JetBlue's partnerships with Aer Lingus, Cape Air, Emirates, Icelandair, Japan Airlines, Lufthansa and Turkish Airlines allow passengers flying to or from markets that JetBlue would otherwise not serve to connect to JetBlue flights at the Airport, further strengthening its position at Logan Airport.<sup>64</sup> The partnerships with Aer Lingus, Cape Air, Japan Airlines, Lufthansa and Turkish Airlines are one-way code sharing agreements, where the partner airlines place their operating codes and flight numbers on flights operated by JetBlue creating a seamless travel experience for passengers connecting at Logan. JetBlue has a two-way codeshare partnership with Emirates. The two-way code share agreements allow partner airlines to place their code on flights operated by JetBlue and vice versa.

<sup>63</sup> 70% of Thomas Cook operations in CY 2015 were charter flights based on United Kingdom Civil Aviation Authority data.

<sup>64</sup> JetBlue also has codeshare relationships with El Al, Etihad, Hawaiian Airlines, Qatar Airways, Singapore Airlines and South African Airways, allowing their passengers to travel to/from Boston on JetBlue flights at select stations (such as New York JFK and Washington National) and then connect to their own operated flights.

Southwest is currently the second largest LCC at Logan Airport. Southwest introduced service to Logan Airport in August 2009 after having served the Boston market from the T.F. Green and Manchester-Boston airports since the late 1990s. After emerging recently from a period of network reconciliation and operations integration with AirTran following the Southwest/AirTran merger, Southwest has begun to expand again at Logan. Southwest is scheduled to provide 269 weekly nonstop departures serving 13 destinations (Atlanta, Austin, Baltimore, Chicago Midway, Columbus, Dallas Love Field, Denver, Houston Hobby, Indianapolis, Kansas City, Milwaukee, Nashville and St. Louis) as of July 2017.

Since 2010, ULCC Spirit Airlines has increased the number of destinations it serves from Logan from three to 12. Spirit provides year-round service to Atlanta, Baltimore, Fort Lauderdale, Myrtle Beach, Orlando and Las Vegas, as well as seasonal service to Atlantic City, Chicago O'Hare, Cleveland, Dallas/Ft. Worth, Detroit, Fort Myers, Minneapolis and West Palm Beach. New daily nonstop service to Tampa was launched in February 2017. As of July 2017, Spirit is scheduled to operate 98 weekly flights.

Virgin America was a new entrant to Logan in August 2009. Focused primarily on long-haul point-to-point flying between major East Coast and West Coast cities, Virgin America is scheduled to operate 45 weekly flights to Los Angeles and San Francisco as of July 2017.

Sun Country Airlines, Westjet, WOW Air and Norwegian Air Shuttle each currently account for less than two percent of weekly seats at Logan Airport. Sun Country provides nonstop service to Minneapolis, with 20 weekly flights as of July 2017. Canadian LCC Westjet launched service in March 2016, and currently provides nonstop services to Halifax, Montreal, and Toronto. Icelandic LCC WOW Air launched Boston-Reykjavik nonstop service in March 2015, operating year-round 6-7 times weekly service to Reykjavik, with connecting flights on to European destinations such as London, Berlin, Copenhagen, Paris, Dublin and Amsterdam. Norwegian Air Shuttle – the third largest LCC in Europe – launched service at Logan in April 2016 and currently provides nonstop services to London Gatwick, Oslo, and Copenhagen. Norwegian's long-haul services from mainland Europe have been made possible through the use of next generation Boeing 787 aircraft, which allows for profitable flying in thinner long haul markets like Boston.

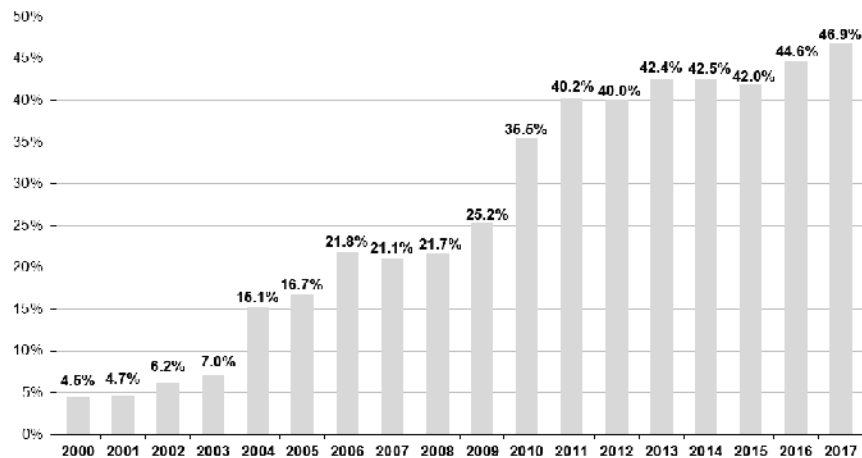
As of July 2017, LCCs provide 46.9 percent of the domestic seat capacity at Logan Airport, up dramatically from 15.1 percent in 2004 when JetBlue first launched service at the Airport (Exhibit 4-35). Between 2009 and 2011, there was a noticeable increase in the LCC share as Southwest and Virgin America initiated services at Logan and as JetBlue expanded by entering markets where network carriers had reduced services. The recent increase between 2014 and 2016 has again been primarily driven by the continued expansion of JetBlue at the Airport.

By way of comparison, the LCC share of total U.S. domestic scheduled seats grew steadily from 1990 through 2010. Since then, the U.S. LCC seat share has stabilized at approximately 30.0 percent and then increased to 33.0 percent in 2017.<sup>65</sup>

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<sup>65</sup> Innovata, July 2010 – July 2017.

**Exhibit 4-35: Low Cost Carrier Share of Weekly Domestic Seats at Logan Airport (July 2000 to July 2017)**



Source: OAG, July 2000 to July 2003, Innovata, July 2004 to July 2017.

4.4.4.2 International Carrier Development

Since 2013, Logan has seen a rapid expansion of international service with the addition of 16 foreign carriers serving 21 international destinations,<sup>66</sup> as outlined in Exhibit 4-36. As of July 2017, there are scheduled to be three U.S. carriers and 30 foreign carriers providing service to 54 international destinations from Logan.

**Exhibit 4-36: New Foreign Carriers International Services at Logan Airport (2013-2017)**

Carrier	Destination	Service Began
Copa Airlines	Panama City	July 2013
Emirates	Dubai	March 2014
Turkish Airlines	Istanbul	May 2014
Hainan Airlines	Beijing	June 2014
	Shanghai	June 2015
WOW Air	Reykjavik	March 2015
Cathay Pacific	Hong Kong	May 2015
Aeroméxico	Mexico City	June 2015
El Al	Israel	June 2015
Norwegian Air Shuttle	Fort De France	December 2015
	Pointe A Pitre	December 2015
	London Gatwick	March 2016
	Oslo	April 2016
	Copenhagen	May 2016

Carrier	Destination	Service Began
Qatar Airlines	Doha	March 2016
Scandinavian	Copenhagen	March 2016
WestJet	Toronto	March 2016
	Halifax	April 2016
	Montreal	October 2017
Air Berlin	Dusseldorf	May 2016
Thomas Cook Airlines	Manchester	May 2016
TAP-Portugal	Lisbon	June 2016
Virgin Atlantic	Manchester	March 2017
Avianca	Bogota	June 2017
Air Europa	Madrid	June 2017
Air Canada	Vancouver	June 2017

Note: After starting service in June 2016, Eurowings stopped seasonal service from Cologne-Bonn to Boston in September 2016.  
Source: Innovata Schedules.

<sup>66</sup> Reykjavik was already served by Icelandair from Logan Airport. Copenhagen is counted once although two carriers have started service since 2013.

Copa Airlines introduced daily nonstop service to Panama City in July 2013. Panama City is the second destination in Central America after Liberia (Costa Rica). The service to Copa's Panama City hub also provides extensive connectivity to onward destinations in Central and South America and the Caribbean.

Calendar year 2014 saw the arrival of three new foreign carriers to Logan. In March 2014, Emirates launched daily Boston-Dubai service, which was Logan's first nonstop service to the Middle East. The new Dubai service provides connections for passengers traveling to/from destinations in the Middle East, India, East Africa and Southeast Asia. Emirates' codeshare partnership with JetBlue, which allows passengers to travel on each airline's flights on a single ticket, is expected to continue to strengthen further the operating performance of the Boston-Dubai service. Turkish Airlines and Hainan Airlines also initiated service to Istanbul and Beijing, respectively, in late spring 2014, enhancing Logan's connectivity to Asia and Europe. Hainan's Boston-Beijing service is operated with the 787 Dreamliner, which has the operating and seating capacity to serve economically thinner long-haul international routes. Hainan's Boston-Beijing service was Logan's second 787 service, after Japan Airlines first launched Boston-Tokyo service with the 787 in 2012.

In 2015, Logan saw the launch of service by four new foreign carriers, as well as additional China service by Hainan Airlines. Icelandic low-cost carrier WOW Air introduced service from Boston to Reykjavik in March 2015, providing Logan passengers with low-cost transatlantic fares and a number of potential connections into Europe through Reykjavik. Cathay Pacific launched four times weekly service from Boston to Hong Kong in May 2015. Hainan Airlines added nonstop 787 service from Boston to Shanghai in June 2015; Shanghai represents Logan's fourth nonstop destination in Asia, in addition to Tokyo, Beijing and Hong Kong. In June 2015, Aeroméxico and El Al launched service to Mexico City and Tel Aviv, respectively. In December 2015, Norwegian launched service to Fort De France (Martinique) and Pointe A Pitre (Guadeloupe).

In 2016, Logan saw another influx of international airlines launching service to new destinations, with a focus on nonstop service to Continental Europe. Qatar Airlines launched daily A350 service direct to Doha in March 2016, while Scandinavian Airlines (SAS) launched Copenhagen service at the end of March 2016. Norwegian Air Shuttle began nonstop 787 service to London Gatwick and Oslo in April 2016 and Copenhagen service in May 2016. In addition, Air Berlin added service four times a week to Dusseldorf in May 2016, TAP-Portugal began nonstop service to Lisbon starting in June 2016 and Thomas Cook commenced service to Manchester. Other new services include Toronto (March) and Halifax (April) service by Canadian LCC Westjet.

In June 2017, Avianca will introduce daily nonstop service to Bogota. Bogota is Logan's first destination in South America and third in Latin America in addition to Panama City and Liberia (Costa Rica). The new service to Avianca's Bogota hub also provides extensive connectivity to onward destinations in Central and South America and the Caribbean. Air Europa, Air Canada and Westjet will also introduce nonstop service to Madrid, Vancouver, and Montreal in 2017, respectively.

In addition to foreign carrier growth at Logan, U.S. carriers JetBlue, American and Delta have also expanded international services in recent years. JetBlue started international services to Bridgetown, Liberia (Costa Rica), Port Au Prince, Puerto Plata, and St. Lucia. American expanded Caribbean services with services to Cancun, Montego Bay, Punta Cana and Providenciales. Delta also expanded their Caribbean services with services to Nassau, Providenciales, Punta Cana, and Montego Bay, and will introduce services to Dublin in May 2017.

Bolstered by these new services, Logan was the 7<sup>th</sup> fastest growing U.S. large hub airport in terms of international seats between July 2013 and July 2017, as shown in Exhibit 4-37. Logan currently also ranks 6<sup>th</sup> among U.S. large hubs in terms of the number of foreign carriers providing service.



**Exhibit 4-37: Growth of International Seats at U.S. Large Hub Airports  
and Number of Foreign Carriers Serving  
(July 2013 – July 2017)**

Seats Change Rank	Airport	Weekly International Seats (July)					Seats Change ('13-'17)	CAGR ('13-'17)	Foreign Carriers Serving
		2013	2014	2015	2016	2017			
1	Salt Lake City	4,383	4,524	7,962	11,501	12,162	7,779	29.1%	2
2	Baltimore	4,715	4,723	7,743	8,777	9,277	4,562	18.4%	4
3	Fort Lauderdale	21,521	27,515	34,447	34,593	39,077	17,555	16.1%	11
4	Portland	6,706	7,152	8,709	10,641	11,936	5,230	15.5%	4
5	Tampa	3,634	4,563	4,578	6,086	6,117	2,482	13.9%	5
6	Orlando	37,772	44,058	53,472	60,016	64,718	26,946	14.4%	19
<b>7</b>	<b>Boston</b>	<b>57,311</b>	<b>66,320</b>	<b>72,788</b>	<b>88,466</b>	<b>90,488</b>	<b>33,177</b>	<b>12.1%</b>	<b>30</b>
8	San Francisco	122,653	129,744	145,372	160,648	179,607	56,954	10.0%	38
9	Los Angeles	225,622	246,165	271,543	293,977	321,520	95,898	9.3%	53
10	Seattle/Tacoma	47,840	51,379	59,842	62,673	64,479	16,639	7.7%	15
11	Chicago Midway	6,726	6,352	9,073	8,606	9,121	2,395	7.9%	2
12	San Diego	9,296	9,613	9,750	11,435	12,552	3,255	7.8%	5
13	Las Vegas	29,695	37,287	39,067	38,465	39,158	9,463	7.2%	13
14	New York - JFK	294,526	317,716	343,222	362,713	366,802	72,276	5.6%	65
15	Denver	25,241	25,314	23,496	25,464	30,219	4,978	4.6%	6
16	Dallas/Fort Worth	90,700	97,434	100,389	101,547	109,552	18,852	4.8%	14
17	Chicago O'Hare	146,315	161,578	162,103	163,333	171,076	24,761	4.0%	36
18	Minneapolis	28,297	28,802	29,242	33,744	32,488	4,191	3.5%	5
19	Houston - IAH	115,632	125,857	139,349	136,343	133,681	18,049	3.7%	20
20	Honolulu	60,808	60,236	62,215	62,565	67,673	6,865	2.7%	16
21	Atlanta	107,983	114,275	116,247	117,099	120,935	12,952	2.9%	9
22	Washington Dulles	95,293	98,437	99,427	105,605	108,086	12,793	3.2%	29
23	New York -EWR	136,293	140,687	140,903	143,022	148,662	12,369	2.2%	21
24	Miami	177,583	179,524	187,235	186,145	187,922	10,339	1.4%	38
25	Detroit	41,577	42,918	42,162	42,541	44,211	2,634	1.5%	5
26	New York - LGA	26,645	26,609	26,150	25,152	25,771	(874)	-0.8%	2
27	Charlotte	27,560	33,289	27,340	26,684	26,888	(672)	-0.6%	2
28	Phoenix	21,760	22,591	23,282	18,423	20,390	(1,370)	-1.6%	4
29	Philadelphia	51,117	56,416	54,734	49,955	47,054	(4,063)	-2.0%	5
30	Washington National	4,973	4,279	4,009	3,949	4,172	(801)	-4.3%	1
	<b>Top Large Hubs</b>	<b>2,030,181</b>	<b>2,175,357</b>	<b>2,305,851</b>	<b>2,400,169</b>	<b>2,505,794</b>	<b>475,613</b>	<b>5.4%</b>	

Note: Excludes the Caribbean. Ranked by '13-'17 percent change in weekly seats. July 2017 is using advance schedules.  
Source: Innovata

The introduction of aircraft with new technology will continue to be a key enabler of new international services at Logan and around the world. New long-range, fuel efficient aircraft with fewer seats has made previously uneconomical long-haul routes possible. Long-range aircraft such as the Boeing 777 are sometimes too large for carriers to serve profitably non-hub markets that do not benefit from significant feeder traffic. However, the Boeing 787 and Airbus 350, which offer fewer seats and greater fuel efficiency, allow carriers to bypass connecting hubs, thereby creating significant opportunities for international market pairings that do not include two hubs, such as Japan Airline's Boston-Tokyo route and Hainan Airlines' Boston to Beijing/Shanghai services. Use of new fuel-efficient aircraft will continue to allow airlines to open up new non-stop routes, introducing more service to markets that may lack significant feeder traffic from a hub carrier, like Boston Logan Airport.

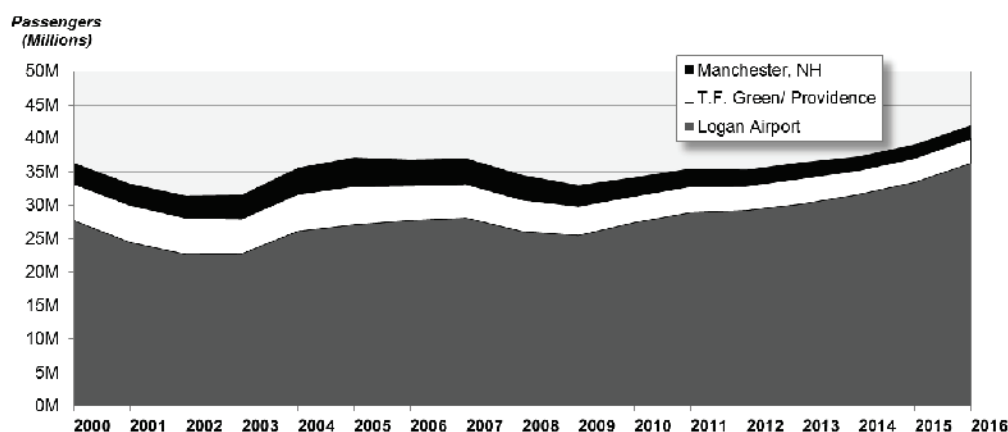
Logan Airport also received its first regularly scheduled Airbus 380 service by British Airways in March 2017. The 469-seat Airbus 380 is the largest aircraft serving Logan and will be used by British Airways for Boston-London service three times a week. The Airbus 380 can potentially be used on additional high density routes should frequencies be limited due to infrastructure constraints.

#### 4.4.4.3 Competing New England Regional Airports

In the late 1990s, secondary airports that provided overlapping service with Logan Airport in the Greater Boston region – T.F. Green/Providence and Manchester – began to gain market share. T.F. Green and Manchester were seen as attractive alternatives to Logan Airport, given increasing service levels at the two airports including low-fare service introduced by Southwest, as well as the major Central Artery/Tunnel construction

project, which hampered access to Logan. As shown in Exhibit 4-39, T.F. Green and Manchester saw an increase in their share of regional passengers from 11 percent in 1995 to approximately 25 percent in 2006.

**Exhibit 4-38: Passenger Shares at New England Regional Airports and Logan Airport (CY 2000 through CY 2016)**



Source: Massport, T.F. Green and Manchester-Boston annual traffic reports.

Over the past decade, however, the growth of LCC services at Logan and industry wide airline retrenchment from smaller, secondary markets have caused a substantial shift in the market dynamics among Logan, T.F. Green and Manchester. The challenging operating environment, including volatile fuel prices and economic recession, resulted in airlines cutting services at secondary markets across the U.S. Passenger traffic at the secondary airports declined at an average annual rate of 6.2 percent between 2006 and 2011, and dropped by 3.0 percent per year from 2011 to 2016. As travel choices became more limited at the secondary airports and the airports lost their low-fare advantage, Logan increased its share of the regional market from 75 percent in 2006 to 87 percent in 2016.

**Exhibit 4-39: Passenger Activity at New England Regional Airports and Logan Airport (In Millions)**

Airport	Airport Passengers					Compounded Annual Growth			
	1995	2000	2006	2011	2016	CY95/00	CY00/06	CY06/11	CY11/16
Logan Airport	24.19	27.73	27.73	28.91	36.29	2.8%	0.0%	0.8%	4.7%
T.F. Green/Providence	2.17	5.43	5.20	3.88	3.65	20.1%	-0.7%	-5.7%	-1.2%
Manchester, NH	0.90	3.17	3.90	2.71	2.02	28.6%	3.5%	-7.0%	-5.7%
<b>Total</b>	<b>27.26</b>	<b>36.33</b>	<b>36.83</b>	<b>35.50</b>	<b>41.96</b>	<b>5.9%</b>	<b>0.2%</b>	<b>-0.7%</b>	<b>3.4%</b>
<b>Boston Logan Airport</b>	<b>24.19</b>	<b>27.73</b>	<b>27.73</b>	<b>28.91</b>	<b>36.29</b>	<b>2.8%</b>	<b>0.0%</b>	<b>0.8%</b>	<b>4.7%</b>
<b>Providence / Manchester Combined</b>	<b>3.07</b>	<b>8.60</b>	<b>9.10</b>	<b>6.59</b>	<b>5.67</b>	<b>22.9%</b>	<b>1.1%</b>	<b>-6.2%</b>	<b>-3.0%</b>
<b>Boston Logan Share</b>	<b>88.7%</b>	<b>76.3%</b>	<b>75.3%</b>	<b>81.4%</b>	<b>86.5%</b>				
<b>Providence / Manchester Share</b>	<b>11.3%</b>	<b>23.7%</b>	<b>24.7%</b>	<b>18.6%</b>	<b>13.5%</b>				

Source: Massport, T.F. Green and Manchester-Boston annual traffic reports.

In the past two years, T.F. Green has been successful in attracting a number of new international services. Norwegian Air will begin operating low-cost flights from T.F. Green Airport to cities in Ireland and Scotland starting in the summer of 2017. Norwegian will introduce transatlantic service to Edinburgh in June 2017, followed by service to Belfast, Bergen, Dublin, Cork, and Shannon in July 2017. Azores Airline and TACV Cabo Verde Airlines also serve T.F. Green with nonstop service to Ponta Delgada and Cabo Verde, respectively.

## 4.5 Aircraft Operations

There were approximately 360,000 commercial airline operations (excluding General Aviation) at Logan during 2016, up 4.5 percent from the previous year (Exhibit 4-40). Since 2001, aircraft operations have fluctuated from a high of 434,000 in 2001 to a low of 327,000 in 2012. The sharp decline in aircraft operations reflects airline capacity cuts and aircraft up-gauging in response to economic downturns, industry consolidation, changes in operating strategy, the withdrawal of the operating entity American Eagle (renamed Envoy Air) from Logan and changes in the aircraft fleet.<sup>67</sup> While aircraft operations increased by 4.5 percent last year, Airport passengers grew by 8.5 percent, showing that the trend of increasing average aircraft size and passenger load factors at Logan continued.

Prior to 2001, domestic regional carrier operations were the fastest growing segment of aircraft activity, averaging increases of 4.9 percent annually between 1970 and 2000. International operations grew at a similarly fast pace of 3.2 percent per year, while domestic large jet operations grew by just 0.9 percent per year over the same period. Since 2001, the domestic regional segment has experienced an average decline of 5.7 percent per year, compared to increases of approximately 0.5 percent per year for both international operations and domestic large jet operations. The sharp decrease in regional carrier operations can be attributed to RJs replacing smaller turboprops at the beginning of the decade and, more recently, RJs falling out of favor because of poor operating economics when fuel prices are high.

**Exhibit 4-40: Historical Aircraft Operations at Boston Logan Airport  
(1970 to 2016)**

Aircraft Takeoffs and Landings <sup>1</sup>					Aircraft Takeoffs and Landings <sup>1</sup>				
Calendar Year	Domestic Large Jet <sup>2</sup>	Domestic Regional	Int'l	Total	Calendar Year	Domestic Large Jet <sup>2</sup>	Domestic Regional	Int'l	Total
1970	189,192	37,800	17,599	244,591	2009	192,356	106,507	34,201	333,064
1980	178,686	60,623	18,858	258,167	2010	210,194	94,193	33,574	337,961
1990	223,955	144,179	31,458	399,592	2011	216,502	88,837	35,418	340,757
2000	248,555	159,025	45,183	452,763	2012	208,364	80,220	38,171	326,755
2005	205,548	132,169	38,697	376,414	2013	216,343	80,356	37,958	334,657
2006	212,011	126,378	36,286	374,675	2014	220,324	77,087	39,970	337,381
2007	210,944	120,503	39,458	370,905	2015	231,378	70,732	42,654	344,764
2008	199,514	111,964	36,306	347,784	2016	241,795	68,608	50,039	360,442
Average Annual Growth					Percent Change Over Prior Year				
1970-80	-0.6%	4.8%	0.7%	0.5%	2011	3.0%	-5.7%	5.5%	0.8%
1980-90	2.3%	9.1%	5.3%	4.5%	2012	-3.8%	-9.7%	7.8%	-4.1%
1990-00	1.0%	0.9%	3.3%	1.1%	2013	3.8%	0.2%	-0.6%	2.4%
2000-11	-1.2%	-5.2%	-2.2%	-2.6%	2014	1.8%	-4.1%	5.3%	0.8%
2011-16	2.2%	-5.0%	7.2%	1.1%	2015	5.0%	-8.2%	6.7%	2.2%
2000-16	-0.2%	-5.1%	0.6%	-1.4%	2016	4.5%	-3.0%	17.3%	4.5%

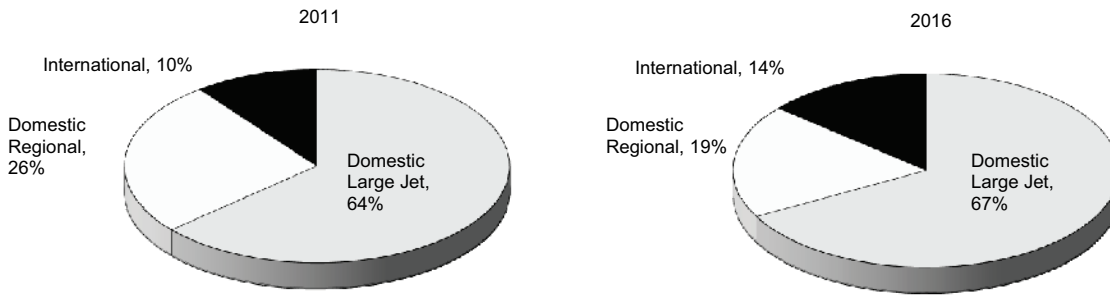
1\ Excludes general aviation operations. 2\ Includes charter operations.

Note: Operations include arrivals and departures. International operations include scheduled and charter operations for U.S. certificated, U.S. regional, and foreign flag carriers. Source: Massport.

Exhibit 4-41 below shows the change in the share of aircraft operations by segment at Logan between 2011 and 2016. Domestic large jet operations accounted for 67 percent of total aircraft operations at Logan in CY 2016, up from 64 percent in 2011. Domestic regional carrier operations accounted for 19 percent of Logan operations in 2016, down from 26 percent in 2011 and a historical peak share of 43 percent in the 1990s. Logan's international services have increased substantially over the past five years, accounting for 14 percent of total operations in 2016, up from 10 percent in 2011.

<sup>67</sup> "Up-gauging" refers to the substitution of larger capacity aircraft for smaller capacity aircraft on a specific route.

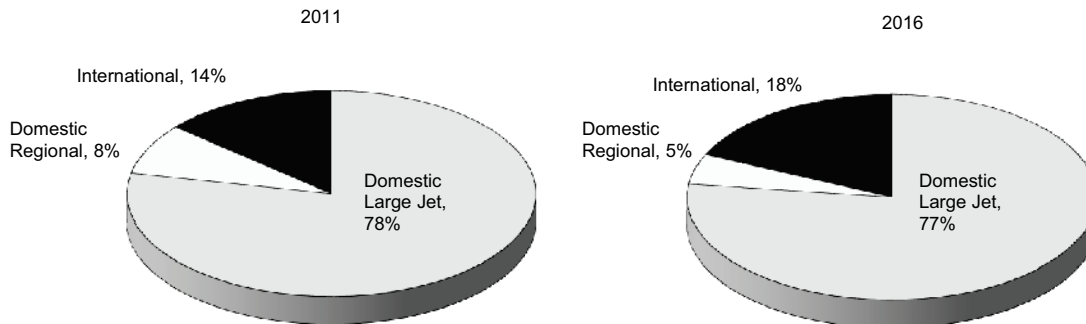
**Exhibit 4-41: Aircraft Share of Operations at Logan  
(CY 2011 vs. CY 2016)**



Source: Massport. Excludes general aviation passengers.

Exhibit 4-42 shows the change in the share of Logan’s passengers by segment between 2011 and 2016. While regional carriers accounted for approximately 19 percent of the Airport’s operations in 2016 (Exhibit 4-41), they carried only five percent of total passengers at Logan. In contrast, domestic large jet operators accounted for 67 percent of Airport operations but 77 percent of Airport passengers in 2016. Compared to 2011, domestic large jet operators maintained their share of total passengers, while domestic regional carriers saw a decline in share and international operators saw an increase in share.

**Exhibit 4-42: Aircraft Share of Passengers at Logan  
(CY 2011 vs. CY 2016)**



Source: Massport. Excludes general aviation passengers.

Over the past couple of decades, the industry has experienced a significant increase in the average number of passengers per aircraft operation, a trend that has been even more pronounced at Logan. As illustrated in Exhibit 4-43, the average number of passengers per commercial airline operation at Logan increased from 61 passengers in 2000 to approximately 100 passengers in 2016. In the last five years, the average number of passengers per commercial airline operation grew by approximately 11 percent from 90 to 100 passengers. This trend reflects the airlines’ continued focus on maintaining high load factors, more effectively assigning appropriately sized aircraft to routes and fleet up-gauging. Regional carriers at Logan have increased average aircraft sizes and nearly doubled the average passengers per operation from 14 in 2000 to 25 in 2016. Domestic large jet carriers are operating at record high load factors and replacing older aircraft models with newer, denser and slightly larger ones. As a result, domestic large jet carriers at Logan have increased the average number of passengers carried per flight from 84 in 2000 to 115 in 2016. The average number of passengers per international flight has also grown from approximately 100 in 2000 to 132 in 2016.

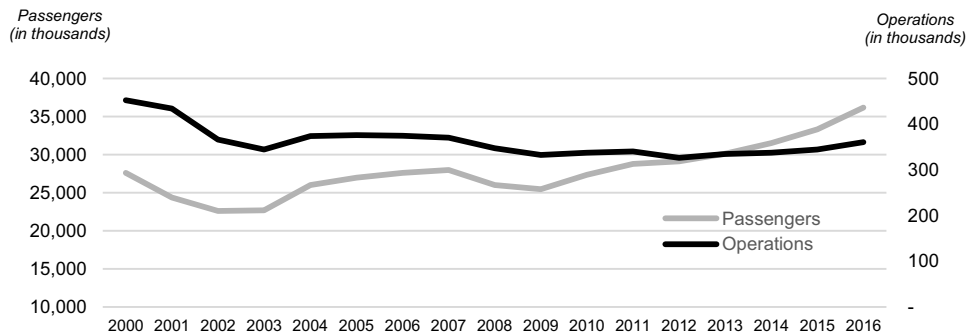
**Exhibit 4-43: Trend in Average Passengers per Operation at Logan (1970 to 2016)**

Calendar Year	Average Passengers Per Operation <sup>1</sup>			
	Domestic Large Jet <sup>2</sup>	Domestic Regional	Int'l	Total
1970	43.4	7.2	52.1	38.4
1980	67.7	7.7	114.5	57.0
1990	80.2	10.3	106.8	57.1
2000	84.2	13.7	99.9	61.0
2005	97.7	20.0	109.5	71.6
2006	98.4	21.3	111.6	73.7
2007	99.9	22.9	105.3	75.5
2008	97.4	23.1	109.5	74.8
2009	99.7	24.3	108.1	76.5
2010	101.7	24.5	109.7	81.0
2011	104.0	26.1	111.9	84.5
2012	108.9	25.7	114.8	89.1
2013	108.9	25.1	119.8	90.0
2014	111.2	26.4	124.9	93.5
2015	112.3	26.0	129.7	96.7
2016	115.2	25.1	131.6	100.4
<b>Average Annual Growth</b>				
1970-1980	4.6%	0.7%	8.2%	4.0%
1980-1990	1.7%	2.9%	-0.7%	0.0%
1990-2000	0.5%	2.9%	-0.7%	0.7%
2000-2011	1.9%	6.1%	1.0%	3.0%
2011-2016	2.1%	-0.8%	3.3%	3.5%
2000-2016	2.0%	3.9%	1.7%	3.2%

1) Excludes general aviation passengers. 2) Includes charter passengers.  
Source: Massport.

As illustrated in Exhibit 4-44, since 2000, carriers have been able to increase passenger traffic while reducing operations at Logan Airport. From 2000 to 2016, passenger traffic (excluding general aviation) at the Airport increased from 27.6 million to 36.2 million, growing by 31 percent or 1.7 percent on average per year. Over the same period, the number of commercial aircraft operations decreased from 452,800 operations to 360,400 operations, a reduction of 20 percent or 1.4 percent on average per year. This reflects the trend of aircraft upgauging and airlines continuing to focus on high load factors.

**Exhibit 4-44: Trend in Average Passengers per Operation at Logan (2000 to 2016)**



Note: Excludes general aviation passengers; Includes charter passengers.  
Source: Massport.

## 4.6 Cargo Traffic

Logan Airport was the 21<sup>st</sup> largest U.S. airport in terms of cargo volume, including mail, for the year ended September 2016 (Exhibit 4-45). Of the top 30 airports based on cargo volume, 11 are primary or regional sorting hubs for all-cargo carriers.<sup>68</sup> If all-cargo airline hubs are excluded, Logan ranks as the 10<sup>th</sup> largest airport in the nation in terms of cargo volume.

**Exhibit 4-45: Top U.S. Airports Ranked by Cargo Volume  
(YE 3Q 2016)**

Rank			Total Cargo (Tons)	5-Year CAGR	Rank			Total Cargo (Tons)	5-Year CAGR
YE 3Q 16	YE 3Q 15	Airport			YE 3Q 16	YE 3Q 15	Airport		
1	1	Memphis	4,582,921	2.4%	16	17	Philadelphia	490,554	-0.9%
2	2	Louisville	2,633,765	2.0%	17	15	Houston Intercontinental	476,525	-0.6%
3	3	Los Angeles	2,116,083	2.6%	18	18	San Francisco	476,145	2.7%
4	4	Miami	1,848,603	-0.3%	19	19	Seattle/Tacoma	377,935	4.2%
5	6	Chicago O'Hare	1,671,661	2.7%	20	21	Phoenix	343,787	4.5%
6	5	Anchorage	1,633,783	-0.1%	<b>21</b>	<b>20</b>	<b>Boston</b>	<b>325,803</b>	<b>3.2%</b>
7	7	New York - JFK	1,333,331	-2.2%	22	22	Washington Dulles	287,552	-3.2%
8	8	Indianapolis	1,044,414	0.9%	23	23	Denver	286,181	-0.3%
9	9	Cincinnati	982,194	15.6%	24	26	Detroit	243,400	2.6%
10	10	New York - EWR	812,207	-1.2%	25	25	Portland	239,744	1.3%
11	11	Dallas/Fort Worth	790,050	3.3%	26	24	Minneapolis	239,279	-0.1%
12	12	Atlanta	701,371	-0.6%	27	28	Orlando	217,893	3.7%
13	13	Honolulu	610,950	2.6%	28	27	Salt Lake City	205,023	2.3%
14	14	Oakland	597,044	2.4%	29	29	San Juan	183,563	3.3%
15	16	Ontario	566,708	4.2%	30	30	San Diego	161,013	3.0%

Source: U.S. DOT, T-100 Database.

Eight all-cargo airlines had operations at Logan in 2016 (Exhibit 4-43). In addition to the all-cargo carriers serving the Airport, passenger airlines also provide belly cargo capacity at the Airport and numerous charter carriers also transport cargo to and from Logan.

**Exhibit 4-46: All Cargo Airlines Operating at Logan  
(CY 2016)**

All Cargo Airlines	
ABX Air	Icelandair Cargo
Air Transport International	Mountain Air Cargo
Atlas Air	UPS
FedEX	Wiggins Airways

Source: Massport.

In 2016, Logan Airport handled 617 million pounds of cargo (freight plus small package/express), excluding mail. (See Exhibit 4-47) Since 2000, total non-mail cargo volumes at Logan have fallen at an average annual rate of 2.0 percent. Both cargo market segments, express/small package and heavy freight, have been declining as a result of slower economic growth, greater use of trucking by the integrators,<sup>69</sup> the loss of 757 capacity on transcontinental passenger airline routes, and the widespread use of electronic document delivery. In 2016, freight volume at Logan increased by 10.3 percent year-over-year and express/small packages cargo volume increased by 4.9 percent, resulting in an overall cargo volume increase of 7.1 percent.

<sup>68</sup> Includes FedEx hubs (Memphis, Miami, Anchorage, Indianapolis, Newark and Oakland); UPS hubs (Louisville, Dallas/Fort Worth, Philadelphia and Ontario); and DHL superhub (Cincinnati).

<sup>69</sup> Unlike traditional all-cargo airlines, which only provide air services for packages and freight shipments, the integrated cargo carriers (FedEx and UPS) provide door-to-door delivery including the air and ground portions of a cargo shipment.

**Exhibit 4-47: Historical Trends in Cargo Volume  
(CY 1990 to CY 2016)**

Year	Total Pounds <sup>1)</sup> (000s)	Annual Percent Change		
		Express/Small Packages	Freight	Total Cargo <sup>1)</sup>
1990	633,435	-	-	-
2000	852,347	1.7%	5.8%	3.4%
2005	741,517	-1.2%	-4.2%	-2.3%
2006	679,068	-10.7%	-4.5%	-8.4%
2007	632,450	-4.5%	-10.7%	-6.9%
2008	587,772	-4.7%	-11.2%	-7.1%
2009	517,557	-15.0%	-6.1%	-11.9%
2010	546,379	4.0%	8.3%	5.6%
2011	529,213	-2.0%	-5.1%	-3.1%
2012	531,831	-1.7%	4.2%	0.5%
2013	538,193	2.2%	-0.4%	1.2%
2014	585,460	6.7%	12.2%	8.8%
2015	575,782	-5.8%	4.8%	-1.7%
2016	616,934	4.9%	10.3%	7.1%
<b>Average Annual Growth</b>				
1990-2000		6.7%	-0.3%	3.0%
2000-2011		-3.4%	-5.5%	-4.2%
2011-2016		1.2%	6.1%	3.1%
2000-2016		-2.0%	-2.0%	-2.0%

1\ Includes freight and express/small packages; excludes mail.

Source: Massport.

#### 4.7 General Aviation

Annual general aviation (“GA”) activity at Logan Airport is shown in Exhibit 4-48. In 2016, Logan Airport accommodated more than 30,000 general aviation operations. While the larger general aviation sector encompasses a broad range of activity from pilot training to recreational and corporate use, the GA activity at Logan consists primarily of business and corporate aviation.

**Exhibit 4-48: General Aviation Activity  
(CY 1991 to CY 2016)**

Year	General Aviation Operations	Annual Percent Change
1990	24,976	-
2000	35,233	-
2005	32,652	4.5%
2006	31,444	-3.7%
2007	28,632	-8.9%
2008	23,820	-16.8%
2009	12,242	-48.6%
2010	14,682	19.9%
2011	28,230	92.3%
2012	28,114	-0.4%
2013	26,682	-5.1%
2014	26,416	-1.0%
2015	28,166	6.6%
2016	30,780	9.3%
<b>Average Annual Growth</b>		
1990-2000		3.5%
2000-2011		-2.0%
2011-2016		1.7%

Source: Massport.

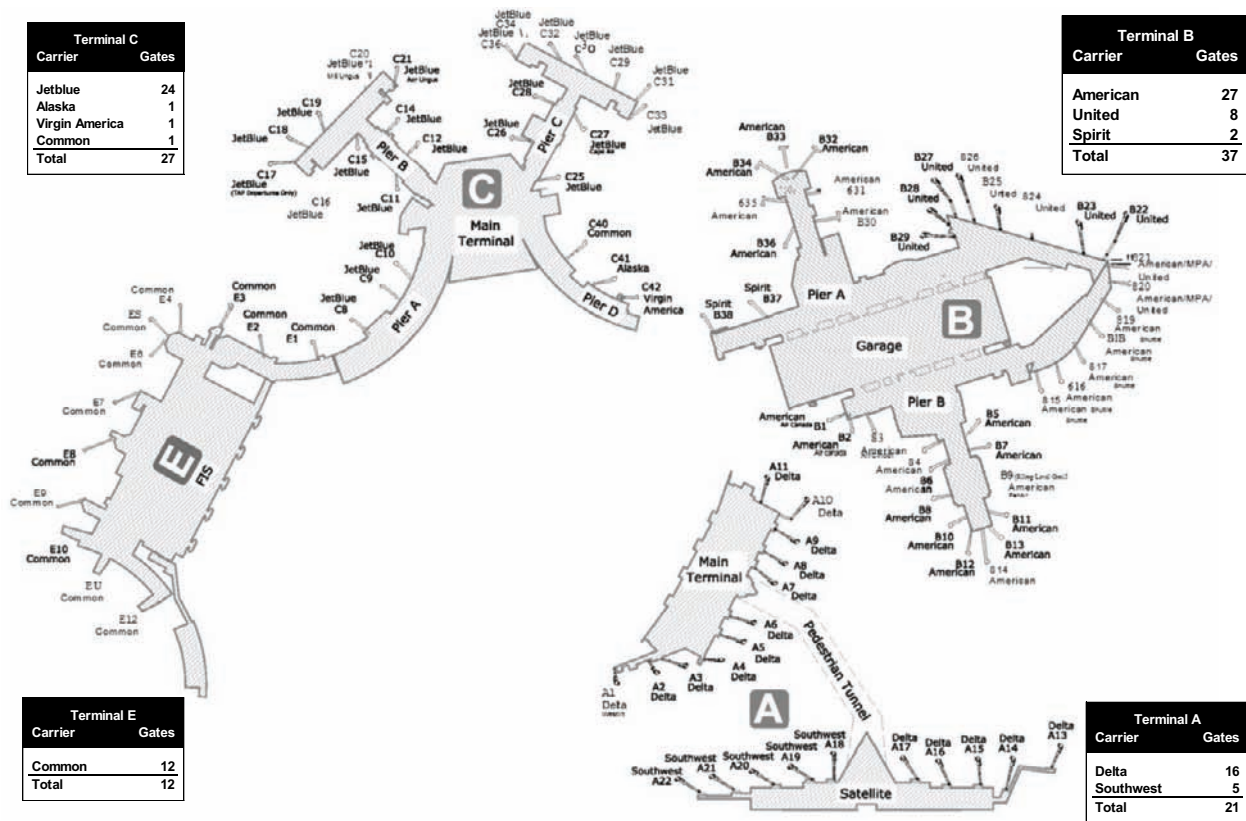
GA activity at Logan closely follows national trends in the use of private jet transportation for business/corporate use and personal travel. General aviation operations fell sharply in 2008 and 2009 following the global credit crisis, the economic recession in the U.S. and a public backlash against corporate use of private air transportation that prompted many businesses to limit their use of general aviation. After bottoming out in 2009, GA activity began to recover in 2010. Between 2011 and 2016, GA operations at Logan increased at an average annual rate of 1.7 percent. The sharp drop in fuel prices in 2015 helped to boost GA activity, with GA operations growing by 6.6 percent in 2015 and 9.3 percent in 2016 after a few years of decline.

#### 4.8 Massport’s Ability to Ensure Efficient Gate Utilization

Massport has implemented several policies and tools that allow for effective reallocation of the Airport’s facilities. These include an Airport-wide Preferential Gate Use Policy, greater use of short-term leases and gate recapture as well as forced sublet provisions that have been incorporated into all new long-term leases at the Airport. Massport has successfully used these policies during carrier bankruptcies and mergers to reassign underused gates quickly.

This section summarizes the current allocation of gates at Logan (see Exhibit 4-49) and the ability of Massport to exert control over underutilized facilities and ensure optimum utilization of the Airport’s facilities.

**Exhibit 4-49: Logan Airport Terminal Layout and Contact Gates by Leaseholders**



Note: As of May 2017. In December 2016, the U.S. regulatory approved the merger between Alaska and Virgin America.  
Source: Massport

Exhibit 4-50 presents leaseholders with Massport by terminal.

Delta currently leases 16 gates in Terminal A and Southwest leases five gates in Terminal A. American currently leases 27 contact gates at Terminal B and subleases five of these gates to other airlines: two to the Authority, which in turn releases such gates to United, and three to Air Canada. Other leaseholders in Terminal B include Spirit (two gates), and United (eight gates). In Terminal C, JetBlue leases 24 gates, subleasing one of these gates to Cape Air; Alaska and Virgin America each lease one gate, and one gate is common use. All gates in Terminal E are common use, which has allowed simpler reconfiguration to accommodate new international carriers.



**Exhibit 4-50: Logan Airport Airline Operators by Terminal  
(as of July 2017)**

Terminal Building	Lease Holders with Massport	Other Carriers Operating in Terminal	
A	Delta Southwest	WestJet <sup>1</sup>	
B	American <sup>2</sup> United Spirit	Air Canada <sup>3</sup> PenAir <sup>4</sup>	
C	JetBlue <sup>6</sup> Alaska Virgin America	Aer Lingus <sup>7</sup> Cape Air <sup>8</sup> TAP <sup>9</sup> Sun Country	
E		Aeroméxico Air Berlin Air France Alitalia American <sup>10</sup> British Airways Cathay Pacific Copa Airlines Delta <sup>10</sup> EL AL Emirates Eurowings Hainan Iberia Icelandair	Japan Airlines JetBlue <sup>10</sup> Lufthansa Norwegian Porter Airlines Qatar SATA Scandinavian SWISS TAP Portugal Thomas Cook Turkish Airlines Virgin Atlantic Wow Air

<sup>1</sup> One contact gate subleased from Delta.

<sup>2</sup> American subleases five gates to other airlines; three to Air Canada and two to the Authority. The Authority currently re-leases these two gates to United.

<sup>3</sup> Three contact gates subleased from American; Air Canada includes Air Canada Jazz.

<sup>4</sup> Remote position subleased from American.

<sup>6</sup> JetBlue subleases one gate to Cape Air. It also allows Aer Lingus to operate out of three of its gates pursuant to a Facility Use Agreement and allows TAP to operate out of one of its gates pursuant to a Facility Use Agreement.

<sup>7</sup> Operates from three of JetBlue's gates pursuant to a Facility Use Agreement.

<sup>8</sup> Subleased from JetBlue. Cape Air provides ramp operations only from its gate in Terminal C.

<sup>9</sup> Operates from one of JetBlue's gates pursuant to a Facility Use Agreement.

<sup>10</sup> International arrivals only.

Source: Massport.

#### 4.8.1 Airport-Wide Preferential Gate Use Policy

Massport's preferential use policy is applicable to all gates at Logan Airport. Under conditions specified in the policy, Massport may schedule arrivals and departures at a gate by carriers other than the tenant for any period that the tenant is not using the gate. The tenant carrier must permit the carrier being accommodated under the policy to use the hold room, loading bridge, baggage claim and other related facilities required for the functional use of the gate, and may assess reasonable fees for such use. If a tenant carrier fails to accommodate a carrier under the terms of the preferential use policy, then Massport may convert the gate to a common use gate.

Massport prefers to lease space at the Airport on a short-term basis, which allows Massport the requisite flexibility to ensure the Airport's limited gate resources are optimally used. In the past, Massport has granted longer term leases to carriers that have made significant capital investments in terminal facilities. Currently, only American holds a long-term lease (with a remaining term greater than five years) with Massport for 20 gates in Terminal B. American's other lease agreement for seven gates in Terminal B expired on April 1, 2015 and is currently in a hold over month-to-month status. The Authority entered into a new lease with Delta for 16 gates in Terminal A in January 2017, which lease has a term of one year, renewable on a year-to-year basis. Massport's JetBlue lease was entered into on March 18, 2005, with an effective date of May 1, 2005 and an original term of five years with 20 automatic one-year extensions thereafter. Massport's United lease was entered into on May 1, 2014 with an original term of one year. The lease is renewable on a year-to-year basis.

In order to ensure maximum utilization of the Airport's gates, Massport's lease agreements with Delta, American and JetBlue contain language that allows Massport to regain control of leased gates should the airline tenants fail to meet certain utilization thresholds. These gate recapture provisions allow Massport to maximize the Airport's gate utilization by redistributing gates from carriers shrinking their operations at Logan to those wanting to expand. These leases also contain provisions that allow Massport to require the airlines to sublease a certain number of gates. Southwest, Spirit, Alaska Airlines and Virgin America have monthly leases that do not contain "recapture" language, but give the Authority the right to terminate portions of the premises on 30-days' notice. Over time, Massport has been successful in securing more stringent gate recapture and forced sublet provisions.

#### 4.8.2 Previous Experience Recapturing Underutilized Gates

Historical experience at Logan Airport demonstrates that gate space abandoned as the result of a major carrier retrenchment or bankruptcy is rapidly re-absorbed by other airlines. In such cases, Massport has assumed an active role in ensuring liquidity in underutilized capacity. In 2003, Northwest Airlines gave up two of its gates to satisfy the U.S. DOT's request that they relinquish gates at their hub airports and at Logan following its marketing agreement with Delta and Continental. The two gates relinquished by Northwest were leased to JetBlue for the start-up of their operations at Logan. In 2006, while in bankruptcy, Delta reaffirmed its lease for Terminal A and relinquished under-utilized gates to Massport. The former Delta gates that reverted to Massport control allowed Continental to relocate from Terminal C to Terminal A and allowed JetBlue to expand its operations at Logan. In 2009, Northwest merged its operations with Delta and relocated to Terminal A and United Airlines gave up two of its underutilized gates, which Massport subsequently re-let to JetBlue allowing for JetBlue's continued expansion at Logan. In 2014, U.S. Airways gave up two of its gates to satisfy the U.S. DOT's request that they relinquish two gates at Logan following its merger with American Airlines.<sup>70</sup>

### 4.9 Terminal Upgrades to Support Traffic Growth

Due to the strong traffic growth at Logan since 2011 (4.7% CAGR) and the changing dynamics of the aviation industry, Massport has undertaken several terminal improvement projects that will help the Airport support future domestic and international passenger growth.

Massport is planning a major expansion of Terminal E. Due to the rapid increase of international airline services at Logan Airport in recent years and continued growth in international passenger traffic expected, the Authority expects international traffic at the Airport to reach 8.0 million annual passengers in 2023, compared to 6.6 million in 2016. Massport recently expanded Terminal E, renovating three gates to allow the servicing of Airbus 380 flights. Additional planned Terminal E expansion will include 7 new gates, a direct connection to Terminal C, increased connectivity for gates, more space for Customs, and a direct pedestrian walkway to the MBTA blue line service, allowing passengers to conveniently access public transportation to travel to downtown Boston. The Airport expects to begin the new project in 2017 and projects that construction will take four years.

Terminal B primarily accommodates American Airlines and United Airlines. Following the merger of American Airlines and US Airways, the Authority is working to assist in accommodating the consolidation of American Airlines from 22 contact gates on Pier A/Pier B to 18 contact gates on Pier B only. Planned optimization includes a new Pier B consolidated security checkpoint, a re-organization of the ticketing hall counters, kiosks and hold rooms and improvements in the baggage handling with the new right size sloped plate baggage carousels.

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<sup>70</sup> These gates were subsequently leased to United.

## 5. REVIEW OF MASSPORT ACTIVITY FORECASTS

### 5.1 Introduction

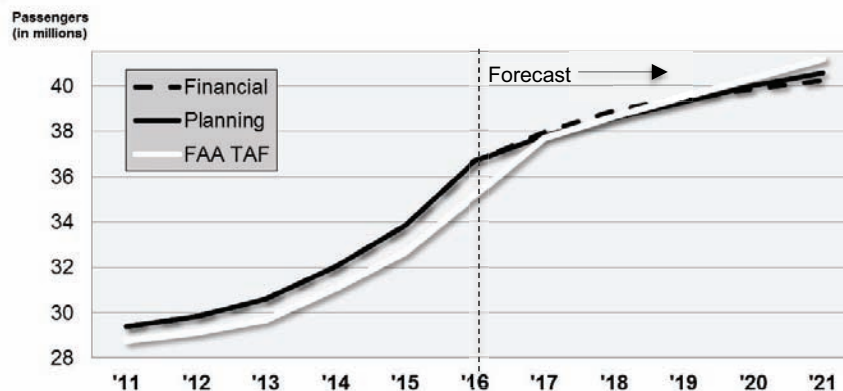
Massport utilizes two types of aviation activity forecasts to manage the future requirements of the Airport:

- ▶ The Massport planning forecast; and
- ▶ The Massport financial forecast.

The Massport planning forecast is used to anticipate future landside and airside infrastructure requirements at the Airport and to estimate the potential environmental impacts of future aviation activity. The Massport financial forecast, which is normally more conservative than the planning forecast, is used for financial planning purposes. This section summarizes and reviews Massport's existing forecasts for Logan Airport and considers the FAA's most recent projections for the Airport.

Forecast passenger levels for Logan Airport through 2021 are presented in Exhibit 5-1 below. Massport's financial and planning forecasts project passenger traffic at the Airport to reach approximately 40.0 million over the next five years. The FAA Terminal Area Forecast (TAF) forecasts somewhat stronger growth, with passenger traffic at the Airport projected to reach 40.7 million in FY 2021.

**Exhibit 5-1: Boston Logan Passengers Forecast  
(CY 2017 to CY 2021)**



**Notes:**

CAGR refers to compound annual growth rate.

Massport's financial and planning forecasts are shown on a calendar year basis. Massport's financial and planning forecast excludes general aviation passengers.

FAA TAF forecast is for Federal fiscal years ended September 30.

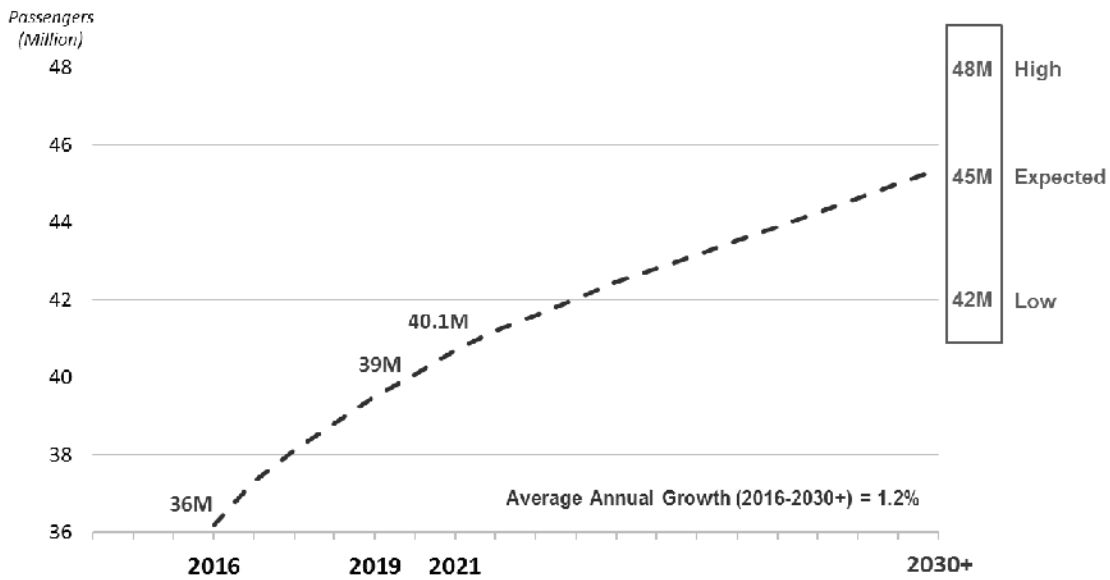
Sources: Massport, FAA Terminal Area Forecasts 2016-2045, January 2017.

### 5.2 Massport Planning Forecasts

Massport uses long-term forecasts of Logan Airport activity to plan for facilities and operations, and to assess environmental impacts. Over the past decade, Massport has updated its long-term planning forecasts several times to account for fluctuations in Airport activity due to economic cycles, the events of 9/11, the 2008-2009 recession, the growth of LCC services, and airline restructuring and consolidation.

The current long-term (through 2030) planning forecast was finalized in March 2017 by InterVISTAS Consulting LLC. Sustained, strong growth at the Airport is expected over the long term, based on a range of announced and anticipated increases by JetBlue, Delta, and Southwest, continued growth in international services from foreign-flag carriers as well as anticipated growth in the economy of the region. Under the long-term planning forecast, the Airport is projected to reach 40.1 million passengers by CY 2021 and achieve a level of between 42 million and 48 million passengers after 2030. Massport uses this planning forecast as a tool to anticipate future airport capacity requirements and plan for the necessary infrastructure to accommodate projected air travel demand. (see Exhibit 5-2).

**Exhibit 5-2: Massport Planning Forecast  
(CY 2016 to CY 2030+)**



Note: Forecast excludes general aviation passengers. Massport’s planning forecast is for the calendar year.

Source: InterVISTAS.

### 5.3 Massport Financial Forecast

Massport’s financial forecast, restated to reflect Massport’s fiscal year, is summarized in Exhibit 5-3. The Authority’s financial forecast projects annual passengers for the next five years, and is intended to present a conservative perspective of Massport’s financial condition. This forecast is used as a key input into the Authority’s financial planning and financial modeling to analyze the Authority’s ability to support operations, borrow additional funds to pay for additional capacity and meet debt service covenants.

Massport’s financial forecast uses actual passenger traffic through March 2017 and then assumes a growth rate of 1.5 percent for the remainder of FY 2017, resulting in an overall growth rate for FY 2017 of 6.1 percent. For FY 2018, the financial forecast assumes annual growth of 3.0 percent, followed by 2.0 percent for FY 2019 and 1.0 percent from FY 2020 onward. Overall, between FY 2016 and FY 2021, passenger traffic is forecast to grow at an average annual growth rate of 2.6 percent, and will result in the Airport reaching a forecast passenger volume of approximately 39.6 million in FY 2021. The relatively high annual average rate between FY 2016 and FY 2021 is driven to a considerable degree by the high passenger growth rate of 6.1 percent anticipated for the current fiscal year (FY 2017).

**Exhibit 5-3: Massport Financial Forecast  
(FY 2016 to FY 2021)**

Year	Annual Passengers Total	Percentage Change
<u>Actual</u>		
2016	34,788,652	8.0%
<u>Forecast</u>		
2017	36,907,000	6.1%
2018	38,014,000	3.0%
2019	38,774,000	2.0%
2020	39,162,000	1.0%
2021	39,554,000	1.0%
<u>Forecast AAGR:</u>		
2016-2021		2.6%

Note: Forecast excludes general aviation passengers. Massport's financial forecast is for the fiscal year ended June 30.  
Source: Massport

## 5.4 FAA Aviation Forecasts

The FAA has developed extensive aviation forecasting models that are used to project passengers and aircraft operations for the U.S. airline industry and for individual airports. The FAA develops its national forecast annually. In March 2017, the FAA released its annual industry forecast – FAA Aerospace Forecasts, Fiscal Years 2017 – 2037 (the U.S. Federal Government fiscal year begins October 1). The national forecast serves as a major input to the development of the individual airport projections in the Terminal Area Forecasts (“TAF”).

### 5.4.1 FAA U.S. Industry Projections<sup>71</sup>

Despite the moderate economic growth in 2016, the U.S. aviation industry performed well, showing record profit and strong traffic growth. Overall passenger enplanements in the U.S. grew by 4.2 percent in 2016, the strongest growth seen since 2005. Domestic enplanements in 2016 grew 4.3 percent, while international enplanements grew by 3.6 percent. The growth in air traffic demand and falling energy prices resulted in record profits for the U.S. airline industry despite declining yields. The FAA’s outlook for the future is optimistic, although long term growth is not expected to be as strong as growth over the last year.

In the near term, world economic growth is forecast to accelerate from 2.4 percent in 2016 to 2.8 percent in 2017 and 3.1 percent in 2018. Real U.S. GDP growth is forecast to increase from 1.6 percent in FY 2016 to 2.1 percent in FY 2017 to 2.5 percent in FY 2018. From FY 2017 to FY 2022, real U.S. GDP growth is assumed to average 2.3 percent before falling to 2.0 percent for the remainder of the forecast period. The FAA forecast assumes oil prices will continue to increase in FY 2017 by 20.5 percent, from approximately \$39 per barrel in FY 2016 to \$47 per barrel in FY 2017. It is assumed that oil prices will not return to FY 2014 levels (at \$98 per barrel) until FY 2026 when prices will finally reach \$100 per barrel, after which prices are projected to grow closer to the rate of inflation. Over the long-term forecast period (FY 2017 to FY 2037), the FAA assumes that oil prices increase at an average annual rate of 5.3 percent.

The FAA forecasts total passenger enplanements in the U.S. will grow by 2.2 percent in FY 2017. Domestic enplanements in FY 2017 are forecast to grow by 2.2 percent, while international enplanements are forecast to grow by 2.3 percent. Over the long-term forecast horizon (FY 2017-2037), total passenger enplanements are forecast to grow by an average annual rate of 1.9 percent. Domestic enplanements will grow by 1.7 percent, while international enplanements will grow by 3.4 percent through FY 2037. This compares to historic overall passenger growth of 1.0 percent per year between FY 2006 and FY 2016. Within the international market

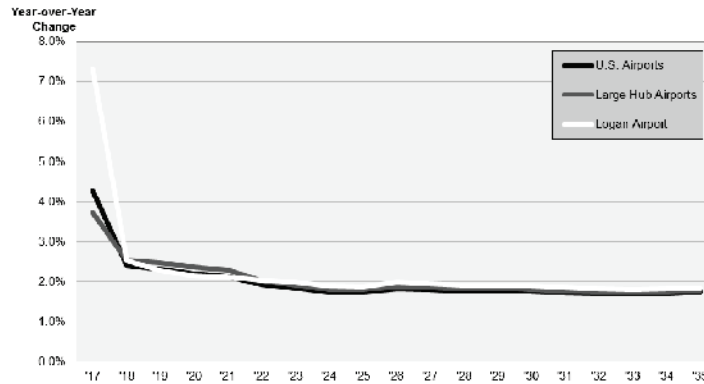
<sup>71</sup> FAA Aerospace Forecast includes U.S. Commercial Carriers projections only.

segment, the Latin America market is forecast to grow the fastest at 4.0 percent per year through FY 2037, followed by the Atlantic market at 2.5 percent per year and the Asia/Pacific market at 2.5 percent per year.

5.4.2 FAA Terminal Area Forecasts for Logan

After completing its industry level forecast, the FAA translates the national forecast into airport level forecasts. The FAA’s most recent Terminal Area Forecast (TAF) for fiscal years 2016-2045 was released in January 2017. The TAF forecasts Logan’s airline passenger traffic to increase at an average annual rate of 2.3 percent and grow to 52.9 million passengers in FY 2035. In the long term, the TAF forecasts Logan Airport to grow at a similar rate to large hub airports and the U.S., year-over-year.

**Exhibit 5-4: FAA TAF, Percentage Change (FY 2017 to FY 2035)**



Note: FAA TAF forecast is for Federal fiscal years ended September 30; 2016 data is forecast by the FAA.  
 Source: FAA Terminal Area Forecast 2016-2045, January 2017.

5.5 ICF Review of Massport Forecasts

Over the past several years, passenger traffic at Logan has experienced growth well above the national average. Airlines continue to be optimistic about the economic and demographic performance of Boston market, and are developing plans to add additional seat capacity at the Airport. Based on this, ICF believes that, in the short to medium term, passenger traffic growth at the Airport will continue to be robust, but will moderate over time. Over the long term planning horizon, ICF believes that passenger volume at Logan will ultimately grow at a slower rate than the national average, reflecting Boston’s maturing role as an air travel market.

**Exhibit 5-5: Boston Logan Passengers Actual (2011 to 2016) and Forecast (2017 to 2021)**

Calendar Year	Massport Financial	Annual Change	Massport Planning	Annual Change	FAA TAF <sup>1</sup>	YoY Change
<b>Actual</b>	<b>CY</b>		<b>CY</b>		<b>FFY</b>	
2011	28,907,938	-	28,907,938	-	28,255,876	-
2012	29,325,617	1.4%	29,325,617	1.4%	28,651,856	1.4%
2013	30,123,759	2.7%	30,123,759	2.7%	29,196,004	1.9%
2014	31,538,203	4.7%	31,538,203	4.7%	30,602,562	4.8%
2015	33,344,432	5.7%	33,344,432	5.7%	32,158,546	5.1%
2016	36,178,526	8.5%	36,178,526	8.5%	34,665,110	7.8%
<b>Forecast</b>						
2017	37,479,360	3.6%	37,300,000	3.1%	37,203,022	7.3%
2018	38,407,330	2.5%	38,100,000	2.1%	38,144,832	2.5%
2019	38,975,137	1.5%	38,800,000	1.8%	39,011,866	2.3%
2020	39,364,888	1.0%	39,510,880	1.8%	39,851,492	2.2%
2021	39,758,537	1.0%	40,074,100	1.4%	40,692,156	2.1%
<b>Average Annual Growth</b>						
2016-2021		1.9%		2.1%		3.3%

Notes:  
 Massport's financial and planning forecasts are shown on a calendar year basis.  
 Massport's financial and planning forecasts exclude general aviation passengers.

<sup>1</sup> FAA TAF forecast is for Federal fiscal years ended September 30. TAF data is forecasted for 2016.

Sources: Massport; FAA Terminal Area Forecasts (January 2017) for historic 2011-2016 and forecast 2016-2021.

ICF believes that the Massport financial forecast and the Massport planning forecast represent reasonable and conservative projections of future activity at the Airport, given the volatility facing the airline industry. The financial and planning forecasts assume a short-term average growth rate of 1.9 percent and 2.1 percent per year, respectively, through CY 2021.

Over the long term, the planning forecast projects passenger traffic to grow by 1.2 percent per year between 2016 and 2030. This compares to the Airport's long-term historical growth of 1.9 percent per year from 1996 to 2016. Similar to the past two decades, there are expected to be periods of strong economic and air traffic growth over the forecast horizon, but also periods of decline associated with economic recession or other system shocks. The Boston air travel market is expected to remain a strong O&D market characterized by travel-intensive industries that generate business travel and also a strong market for LCC operations. However, because Boston is a relatively mature market, future passenger growth is expected to be similar to or slower than the national average (the FAA forecasts U.S. passenger enplanements to grow by 1.9 percent per year through 2037)<sup>72</sup>.

In ICF's opinion, over the long term, Massport's planning and financial forecasts represent reasonable projections of future passenger activity at Logan Airport, appropriate for facility and financial planning purposes.

### 5.5.1 Forecast Risks

Any forecast is subject to uncertainties. Inevitably, some assumptions will not be realized, and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material. While the Massport forecasts are based on historical data and future assumptions that ICF believes are reasonable, some of the underlying assumptions that are

<sup>72</sup> FAA Aerospace (FY 2017 – 2037).

detailed explicitly or implicitly may not materialize due to unforeseen events or circumstances. The main uncertainties to the forecasts are:

- ▶ Future fuel prices;
- ▶ Terrorist acts that could disrupt air travel demand;
- ▶ Short-term service disruptions at the Airport due to further airline restructuring activities (liquidations or consolidation);
- ▶ The ability of airlines to operate profitably;
- ▶ Weak global economic growth;
- ▶ Environmental regulations that could increase airline costs or restrict activity;
- ▶ Long-term changes in air travel propensities;
- ▶ Congestion and delays in the national airspace system; and
- ▶ Changes in economic policies and infrastructure spending that may result from the new U.S. administration.



**APPENDIX D**

REVIEW OF AIRPORT PROPERTIES NET REVENUES FORECAST

related to the proposed issuance of

MASSACHUSETTS PORT AUTHORITY

REVENUE BONDS, SERIES 2017-A (AMT)

Prepared for

Massachusetts Port Authority  
Boston, Massachusetts

Prepared by  
LeighFisher  
Burlingame, California

June 15, 2017

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June 15, 2017

Mr. Thomas P. Glynn  
Chief Executive Officer and Executive Director  
Massachusetts Port Authority  
One Harborside Drive, Suite 200S  
East Boston, Massachusetts 02128

Re: **Review of Airport Properties Net Revenues Forecast  
Massachusetts Port Authority  
Revenue Bonds, Series 2017-A (AMT)**

Dear Mr. Glynn:

LeighFisher is pleased to submit this review of the Airport Properties Net Revenues forecast in connection with the proposed issuance of Revenue Bonds, Series 2017-A (AMT) (the Series 2017 Bonds), by the Massachusetts Port Authority (the Authority). The Series 2017 Bonds are being issued pursuant to the Trust Agreement by and between the Authority and U.S. Bank National Association, as trustee, dated as of August 1, 1978, as amended and supplemented (the 1978 Trust Agreement). Capitalized terms not otherwise defined have the meanings given to such terms in the 1978 Trust Agreement.

The Authority is a multipurpose agency that owns and operates Boston-Logan International Airport (the Airport, or Logan Airport); Hanscom Field, a general aviation reliever airport; and Worcester Regional Airport (collectively, the Airport Properties); and certain Port Properties. As described in the Official Statement, to which this review is attached as an appendix, the Series 2017 Bonds are payable solely from Revenues of the Authority, which include revenues from both the Airport Properties and the Port Properties. However, this review focuses solely on the Airport Properties, which in FY 2016\* generated 85.2% of total Authority Revenues (i.e., references in this report to Airport Properties revenues pertain to 85.2% of total Authority Revenues as described in Appendix A of the Official Statement for the Series 2017 Bonds, to which this review is attached).

The Authority intends to issue the Series 2017 Bonds under the terms of its 1978 Trust Agreement to finance a portion of the costs of certain capital improvements to the Airport Properties, as well as to refund a portion of the Authority's outstanding bonds. These improvements are part of the Authority's overall \$3.5 billion capital program for the period FY 2017 to FY 2021 (the FY 2017-FY 2021 Capital Program), of which:

- **Airport Properties** total \$1.75 billion in capital improvements (\$1.46 billion for Logan Airport, a combined \$108 million for Hanscom and Worcester, and an additional \$180 million in third-party funded improvements across all three airports)
- **Port Properties** total \$1.67 billion in capital improvements (\$392 million in Authority-funded capital improvements and an additional \$1.28 billion in private, third-party investment), and
- **Agency-wide** improvements (which encompass assets that benefit the entire Authority, such as Authority-wide technology systems) total \$87 million.

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\*The Authority's Fiscal Year (FY) ends June 30.

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The following projects will be partially funded with a portion of the net proceeds of the Series 2017 Bonds (bond funded amounts total \$91.0 million):

- **Terminal B Optimization** (\$77.5 million in Series 2017 Bond net proceeds): Construction of new space and renovation of existing space located in and adjacent to Terminal B, Pier B, to allow American Airlines to consolidate its operations in Terminal B, including a new consolidated passenger security checkpoint in Pier B, expansion and reorganization of ticketing hall counters, kiosks, and holdrooms, improvements to baggage handling carrousel, improved horizontal and vertical passenger circulation, and improvements to concession space, as well as associated apron, utilities, and building systems improvements.
- **Other Landside Projects** (\$13.5 million in Series 2017 Bond net proceeds): Includes the replacement of aging Terminal E West substation equipment, Customs and Border Protection (CBP) area improvements in Terminal E to expand queuing area for the accommodation of increased international flights, and Terminal C to E lower level interior renovations.

In addition, the Authority intends to use a portion of the proceeds of the Series 2017 Bonds to refund a portion of its outstanding Bonds. The potential debt service savings associated with such refunding are not reflected in this review.

The Authority has prepared certain financial forecasts in connection with the issuance of the Series 2017 Bonds, which are included in Appendix A of the Official Statement for the Series 2017 Bonds, to which this review is attached as Appendix D.

## SCOPE OF STUDY

In conducting our study, we reviewed:

- The estimated costs and funding sources for Airport Properties capital improvements included in the FY 2017-FY 2021 Capital Program, as prepared by the Authority.
- The forecast sources and uses of funds for the Series 2017 Bonds, and associated forecast annual debt service requirements for the Series 2017 Bonds, as prepared by the Authority and its financial advisor, PFM Financial Advisors LLC, as well as the Authority's preliminary plans for future bond issues during the period FY 2018 through FY 2021. (As part of separate services provided to the Authority by LeighFisher, we assisted the Authority and its financial advisor in formulating a preliminary plan of finance for implementing the FY 2017-FY 2021 Capital Program).
- The Authority's approved passenger facility charge (PFC) program. We also reviewed the Authority's preliminary plans for future PFC applications during the period FY 2018 through FY 2021. PFC revenues of the Authority are not pledged to the payment of debt service on the Series 2017 Bonds.
- The Authority's Strategic Plan reflecting the Authority's current intentions regarding the long-term development of its Airport Properties as well as the Authority's non-aviation properties.

- The Authority's rental car customer facility charge (CFC) program, including its history of CFC collections since inception of the program in 2008. CFC revenues of the Authority are not pledged to the payment of debt service on the Series 2017 Bonds.
- The Authority's business arrangements related to the development and operation of the Rental Car Center that opened for service in 2013, as well as the concession agreements between the Authority and the rental car companies related to rental car operations at the Airport.
- The Authority's forecast of deposits to the Payment in Lieu of Taxes (PILOT), Self-Insurance, Maintenance Reserve, Capital Budget, and Improvement and Extension funds or accounts.
- The Authority's policies and rate-making procedures relating to the calculation of airline terminal rents and landing fees, as documented in the Authority's financial model for calculating annual airline rates and charges, the Authority's document titled "Preliminary FY17 Commercial Aviation Rates," which was adopted as the rate schedule in effect for FY 2017, and documentation of Authority Board votes related to airline rates and charges.
- Contractual agreements relating to the use and occupancy of Airport Properties, focusing on those that materially contribute to Airport Properties revenue totals, including the Delta Air Lines lease and Southwest Airlines lease for portions of Terminal A; the Trust Agreement between the Authority and the Bank of New York, as trustee, related to the Authority's Special Facilities Revenue Bonds, Series 2001 (as amended and restated) for the development of Terminal A; the American Airlines, United Airlines, and Spirit Airlines leases for portions of Terminal B; the JetBlue Airways lease for portions of Terminal C; as well as agreements governing the operation of concession privileges in the terminal area, agreements related to the operation of rental car activities at the Airport, and agreements with transportation network companies (TNCs) operating at the Airport.
- The Authority's procedure for allocating general and administrative expenses and PILOT costs as documented in the Authority's financial model for calculating annual airlines rates and charges, and the Authority's document titled "Preliminary FY17 Commercial Aviation Rates."
- Historical correlations between and among Airport Properties revenues, Airport Properties operating expenses, and passenger enplanements at the Airport.
- The Authority's actual Airport Properties operating expenditures for FY 2016, the Authority's estimate of operating expenditures for FY 2017 based on trends in actual data for the first nine months of FY 2017, the Authority's budgeted operating expenses for FY 2018, and the Authority's forecast of operating expenses for FY 2019 through FY 2021.
- The Authority's actual Airport Properties operating revenues for FY 2016, the Authority's estimate of revenues for FY 2017 based on trends in actual data for the first nine months of FY 2017, the Authority's budgeted operating revenues for FY 2018, and the Authority's forecast revenues for FY 2019 through FY 2021.
- The Authority's Comprehensive Annual Financial Report (CAFR) for FY 2016.

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- The study, dated June 15, 2017, prepared by ICF, of the underlying market for airline traffic demand at the Airport, including trends in the population and economy of the geographic region served, historical trends in airline traffic, key factors affecting future airline traffic, and the Authority's forecasts of airline traffic used for facilities planning purposes and underlying its financial forecasts.

We have relied upon the information listed above and other information provided to us without validating the accuracy, completeness, or reliability of such information. While we have no reason to believe that the information does not provide a reasonable basis for the financial forecasts set forth in this review, we offer no assurances as to the accuracy or reliability of such information.

We have relied upon the estimates of project costs and construction schedules for projects included in the FY 2017-FY 2021 Capital Program as prepared by the Authority. We did not conduct an independent review of the cost estimates or the construction schedules, and offer no opinion on the reasonableness of such costs or the achievability of such schedules.

We reviewed the key factors upon which the Airport Properties Net Revenues may depend, and assisted the Authority in formulating certain assumptions about those factors. Specifically, we assisted the Authority in formulating assumptions regarding passenger enplanements, airline revenues, and operating expenses including incremental operating expenses for new Airport facilities; and we reviewed the Authority's forecasts of parking, rental car, and terminal concession revenues.

#### **KEY FACTORS AFFECTING THE NET REVENUES FORECAST**

The forecast of Airport Properties Net Revenues is set forth in the accompanying Exhibit A. Achievement of the financial forecast will depend particularly on achievement of the assumptions regarding the key factors described below.

#### **Aviation Activity Forecast**

As shown in Table 1, the Authority's financial forecast is based on the assumption that total passengers at the Airport will increase by 6.1% in FY 2017 compared to FY 2016 (based on nine months of actual data for FY 2017, during which period passenger numbers increased by 7.8%, and an estimated 1.5% increase for the remaining three months of the fiscal year), and reach 36.9 million passengers for the full FY 2017. Further, the Authority's forecast reflects a 3.0% annual increase in FY 2018, a 2.0% increase in FY 2019, and 1.0% increases in FY 2020 and FY 2021 (the final year of the forecast period), reaching 39.6 million passengers in FY 2021.



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Table 1  
**ACTUAL AND FORECAST PASSENGERS**  
Boston-Logan International Airport  
(For the 12 months ending June 30, in thousands)

	Actual		Forecast				
	FY 2015	FY 2016	FY 2017 (b)	FY 2018	FY 2019	FY 2020	FY 2021
Total Passengers (a)	32,203	34,789	36,907	38,014	38,774	39,162	39,554
<i>Percentage change</i>		8.0%	6.1%	3.0%	2.0%	1.0%	1.0%

(a) Excludes general aviation passengers.  
(b) Reflects actual data for the nine months ended March 31, 2017, and estimated data for the remaining three months of FY 2017.

Source: Massachusetts Port Authority.

**Aviation Activity Forecast Risk Factors**

As the Airport predominantly serves origin and destination activity (and has limited connecting passenger activity), future growth in aviation activity at the Airport will occur largely as a function of the growth in the population and economy of the Boston area, as well as regional, national, and international economic performance.

With the globalization of business and the increased importance of international trade and tourism, international economics, trade balances, currency exchange rates, government policies, and political relationships all influence passenger traffic at major U.S. airports. Concerns about hostilities and other perceived security and public health risks and associated travel restrictions also affect travel demand to and from particular international destinations. In March 2017, the Trump Administration issued an executive order seeking to ban international travel from certain countries in the Middle East and Africa. This proposed travel ban is the subject of court challenges and has not yet been implemented. Sustained future increases in passenger traffic at the Airport will depend on global economic growth, stable and secure international conditions, and government policies that do not materially restrict international travel.

Additionally, several other factors will play a role in the growth in aviation activity at the Airport, including:

- Airline service at the Airport and other regional airports, particularly Manchester Boston Regional Airport in Manchester, New Hampshire (Manchester) and T.F. Green Airport in Warwick, Rhode Island (T.F. Green)
- Aviation safety and security concerns
- The financial health of the airline industry
- Airline service, competition, routes, and fares
- Demand for air cargo

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- Availability and price of aviation fuel
- Capacity of the national air traffic control system, and
- Capacity of Boston-Logan International Airport

The national economic recession experienced in 2008 and 2009 had a negative effect on passenger traffic at the Airport. Passenger numbers (enplaned plus deplaned passengers) for FY 2009 totaled 25.0 million, representing a 10.3% decline from the 27.9 million passengers that traveled through the Airport in FY 2007 (which at that time was a record number).

Starting in late 2009, traffic levels at the Airport began to recover. In FY 2016, passenger numbers reached 34.8 million (excluding general aviation passengers), a new high.

General factors that will affect the level of passenger traffic at the Airport and other airports include the following:

***Airline service at the Airport and other regional airports.*** The Airport is scheduled to have on average 462 scheduled daily nonstop departures to destinations throughout the United States during June 2017. Additionally, there are approximately 74 average daily international departures, primarily to Canadian and European destinations, but also including destinations in Central America, the Caribbean, Asia, and the Middle East. Several foreign flag carriers have commenced service at the Airport since 2014, including Aeromexico, Air Berlin, Cathay Pacific, El Al, Emirates, Hainan, Norwegian Air Shuttle, Qatar, SAS, TAP Portugal, Thomas Cook, Turkish, WestJet and WOW Air. Two additional foreign-flag airlines, Air Europa and Avianca, are scheduled to start service at the Airport during June 2017.

There is no significant market share concentration among either domestic or foreign flag carriers at the Airport. JetBlue had the largest share of total Airport passengers with approximately 27% in FY 2016, but a total of four airlines have market shares above 10% (inclusive of JetBlue). Additionally, four different airlines have a 9% to 10% share of the international market at the Airport (British Airways, Delta, JetBlue, and Air Canada). The Airport is primarily an origin-destination airport, with approximately 95% of passengers beginning or ending their travel in at the Airport.

In recent years, JetBlue has placed emphasis on routing international connecting traffic through its major East Coast airports (New York-Kennedy, Fort Lauderdale, and Logan Airport). JetBlue's strategy is to enter into alliances and agreements with foreign flag carriers to feed its domestic route network with international passengers. JetBlue has such agreements with Aer Lingus and Emirates Airlines, among other airlines. While to date there has been no discernable impact on connecting passenger activity levels at Logan Airport resulting from these arrangements, there may be a resulting uptick in connecting passenger activity at Logan Airport in the future. The Authority's passenger traffic forecasts described in this report do not incorporate increases in passenger hubbing activity that could potentially occur in the future, which would likely be accretive to the forecast passenger numbers.

Of the three major airports serving the Boston area (which include T.F. Green and Manchester, in addition to Logan Airport), the Airport has always had by far the largest passenger market share in the region. However, during the period from approximately 1995 to 2005, the Airport's regional market share declined from 89% to 73% as low cost carriers (LCCs) aggressively built up their operations at

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Manchester and T.F. Green. The shift in service at that time was partly attributable to construction of the underground Central Artery and Third Harbor Tunnel roadway project, which inhibited Airport access. Since 2005, however, the trend has reversed. A strong buildup of LCC activity at the Airport, combined with retrenchment at Manchester and T.F. Green, has driven the Airport's regional market share back up to 86% in calendar year 2016, according to traffic statistics reported by each airport.

***Aviation safety and security concerns.*** Concerns about the safety of airline travel and the effectiveness of security precautions influence passenger travel behavior and airline travel demand. Anxieties about the safety of flying and the inconveniences and delays associated with security screening procedures lead to both the avoidance of travel and the switching from air to surface modes of transportation for short trips. Public health and safety concerns have also affected airline travel demand from time to time.

Safety concerns in the aftermath of the September 2001 terrorist attacks were largely responsible for the steep decline in airline travel nationwide in 2002. Since 2001, government agencies, airlines, and airport operators worldwide have upgraded security measures to guard against changing threats and maintain confidence in the safety of airline travel. In the U.S., these measures include strengthened aircraft cockpit doors, changed flight crew procedures, increased presence of armed sky marshals, federalization of airport security functions under the Transportation Security Administration (TSA), more effective dissemination of information about threats, more intensive screening of passengers and baggage, and deployment of new screening technologies. The TSA has introduced "pre-check" service to expedite the screening of passengers who have submitted to background checks. Concerns about air travel security were heightened in 2016 by gun and bomb attacks at Brussels Airport (in March) and Istanbul Airport (in June). In March 2017, the TSA implemented a ban on laptop computers and other electronic devices larger than cellphones in the cabins of flights to the United States on certain airlines from certain airports in the Middle East.

Historically, airline travel demand has recovered after temporary decreases stemming from terrorist attacks or threats, hijackings, aircraft crashes, public health and safety concerns, and international hostilities. Provided that precautions by government agencies, airlines, and airport operators serve to maintain confidence in the safety of commercial aviation without imposing unacceptable inconveniences for airline travelers, it can be expected that future demand for airline travel at the Airport will depend primarily on economic, not safety or security, factors.

***The financial health of the airline industry.*** The number of passengers using the Airport will depend partly on the profitability of the U.S. airline industry and the associated ability of the industry and individual airlines to make the necessary investments to provide service. From 2010 through 2013, the U.S. passenger airline industry as a whole recorded net income of approximately \$18 billion, notwithstanding sustained high fuel prices, by controlling capacity and nonfuel expenses, increasing airfares, recording high load factors, and increasing ancillary revenues. Between 2010 and 2013, the airlines collectively increased domestic seat-mile capacity by an average of 1.0% per year. In 2014, the U.S. passenger airline industry reported net income of \$9 billion, assisted by reduced fuel prices in the second half of the year (as discussed in the later heading, "Availability and price of aviation fuel"). In 2015, the industry then achieved record net income of \$26 billion, as fuel prices decreased further, demand remained strong, and capacity control allowed average fares and ancillary charges to remain high. Strong industry profitability continued in 2016, although at a slightly lower level in response to rebounding fuel prices.

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Sustained industry profitability will depend on, among other factors, economic growth to support airline travel demand, continued capacity control to enable increased airfares, and stable fuel prices. Consolidation of the U.S. airline industry has resulted from the merger of Delta and Northwest (2009), the merger of United and Continental (2010), the acquisition of AirTran by Southwest (2011), and the merger of American and US Airways (2013). In December 2016, Alaska Air Group, parent of Alaska Airlines, concluded its acquisition of Virgin America Airlines. In 2016, the two airlines together accounted for 7.0% of domestic U.S. airline industry seat-mile capacity.

Such consolidation has resulted in four airlines (American, Delta, Southwest, and United) and their regional affiliates now accounting for approximately 80% of domestic seat-mile capacity. The consolidation is expected by airline industry analysts to contribute to industry profitability. However, any resumption of financial losses could cause U.S. airlines to seek bankruptcy protection or liquidate. The liquidation of any of the large network airlines would significantly affect airline service at certain connecting hub airports, present business opportunities for the remaining airlines, and change airline travel patterns nationwide.

Because the Airport is predominantly an origin and destination airport, with limited connecting passenger activity, it is expected that if JetBlue or another carrier serving the Airport were to liquidate or were to significantly reduce service at the Airport as a result of a merger with another airline, there would be no material long-term reduction in the number of passengers using the Airport, because other airlines would be expected to increase service to accommodate passengers who would otherwise have traveled on the liquidated carrier. In the event of such an occurrence, however, there could be a material reduction in passenger numbers at the Airport in the short term, because the other airlines serving the Airport would require lead time to adjust their local operations and flight schedules.

***Airline service, competition, routes, and fares.*** The number of origin and destination passengers traveling through the Airport depends on the propensity of Boston region residents to travel by air and the intrinsic attractiveness of the region as a business and leisure destination. Although passenger demand at an airport depends primarily on the population and economy of the region served, airline service and the numbers of passengers enplaned also depend on the route networks of the airlines serving that airport. Major network airlines have emphasized the development of hub-and-spoke route networks as a means of increasing their service frequencies, passenger numbers, and profitability. Logan Airport almost exclusively serves origin-destination passengers. It does not serve as a hub for any airline and, consequently, is not dependent on connecting passengers.

Airline fares have an important effect on passenger demand, particularly for relatively short trips for which the automobile and other travel modes are potential alternatives, and for price-sensitive “discretionary” travel. The price elasticity of demand for airline travel increases in weak economic conditions when the disposable income of potential airline travelers is reduced. Airfares are influenced by airline capacity and yield management; passenger demand; airline market presence; labor, fuel, and other airline operating costs; taxes, fees, and other charges assessed by the airlines themselves as well as governmental and airport agencies; and competitive factors. Future passenger growth – globally, nationwide and at the Airport – will depend partly on the level of airfares.

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Overcapacity in the industry, the ability of consumers to compare airfares and book flights easily via the Internet, and other competitive factors combined to reduce airfares between 2000 and 2005. During that period, the average domestic yield for U.S.-flag airlines decreased from 16.1 cents to 13.8 cents per passenger-mile. By 2008, as airlines reduced capacity and were able to sustain fare increases, the average domestic yield increased to 14.0 cents per passenger-mile. Yields again decreased in 2009, but reversed course beginning in 2010 as airline travel demand increased and seat capacity was restricted. Industry-wide, yields declined slightly to 13.4 cents per passenger-mile as of the third quarter of 2016. Beginning in 2006, ancillary charges have been introduced by most airlines for services such as checked baggage, preferred seating, in-flight meals, and entertainment, thereby increasing the effective price of airline travel more than these yield figures indicate.

LCC carriers, including ultra-low cost carriers (ULCCs), have aggressively expanded their operations throughout the nation. LCCs are carriers that take advantage of an operating cost structure that is significantly lower than the cost structure of the legacy carriers. These advantages can include lower labor costs, greater labor flexibility, a streamlined aircraft fleet (i.e., fewer different types of aircraft in a given airline's fleet), and a generally more efficient operation. These low costs suggest that the LCCs can offer a low fare structure to the traveling public while still maintaining profitability. In calendar year 2016, LCCs provided approximately 29% of the airline seat capacity in the U.S. market.

LCCs have significantly increased their service at the Airport, in common with many large hub airports\* nationwide. Five domestic LCCs currently operate at the Airport—JetBlue, Southwest, Spirit, Sun Country and Virgin America. In addition, five foreign flag LCCs, Air Berlin, Norwegian Air Shuttle, Thomas Cook, WestJet, and WOW Air, provide international service to eight destinations. Collectively, the ten LCCs provided 214 daily departures as of June 2017 (according to published schedules) and account for 41% of Airport-wide scheduled departing seats in FY 2017, significantly higher than the national average, up from 27% in FY 2010. The LCCs collectively lease 32 of the 98 total gates at the Airport.

Notwithstanding these trends, to some extent, there is now a blurring of the distinction between the major network airlines and LCCs. As the LCCs have started to serve airports in major metropolitan areas (such as JetBlue at Logan Airport and New York-Kennedy; Southwest at Logan Airport and New York-LaGuardia, etc.), and some LCCs have faced increases in labor costs (e.g., unionized labor and maturing crews with increased pay), the cost base of the traditional LCC has trended upwards. At the same time, the network carriers have been striving to adopt some of the practices and operational norms of the LCCs, resulting in a general downtrend for major network airline costs.

***Demand for air cargo.*** Although economic activity is the primary factor affecting world air cargo demand, there are other important factors, some of which are influenced by airline actions. Air cargo development is influenced by such airline actions as the acquisition of new aircraft, increased capacity in certain regions or on specific routes, and expansion of air cargo provider products and services. One example of this is the impact on cargo tonnage produced by the express and small-package market. Factors beyond the control of airlines and the cargo industry as a whole (freight forwarders, warehouse operators, local trucking companies) include changing inventory management techniques, globalization of trade, market liberalization, electronic delivery of documents, continuing introduction of new products that are conducive to shipment by air (e.g., lightweight but high-value

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\*Large hub airports are defined by the FAA as those that represent at least 1% of total enplanements nationwide.

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electronics, computer equipment, pharmaceuticals), evolving modes of product delivery and advanced techniques of product manufacturing (e.g., 3D printing).

During FY 2016, 275,000 metric tons of cargo was shipped through Logan Airport, making it the 21<sup>st</sup> busiest cargo airport in the U.S. As such, cargo is considered a key contributor to operations at the Airport.

Historically, the financial performance of the air cargo and cargo transportation industry has experienced periods of growth and decline but, generally speaking, the financial health and performance has been more stable and consistent than that of the U.S. passenger airline industry. Sustained profitability will depend on, among other factors, economic growth to support air cargo demand, continued growth in online retail sales, continued control over air package pricing, and stable fuel prices. Boeing and Airbus forecast worldwide growth in air cargo tonnage of approximately 4% per year over the next 20 years, driven primarily by growth in emerging markets.

***Availability and price of aviation fuel.*** The price of aviation fuel is a critical and uncertain factor affecting airline operating economics. Fuel prices are particularly sensitive to worldwide political instability and economic uncertainty. Beginning in 2003, aviation fuel prices increased as a result of the invasion and occupation of Iraq; political unrest in other oil producing countries; the growing economies of China, India, and other developing countries; and other factors influencing the demand for and supply of oil. By mid-2008, average fuel prices were three times higher than they were in mid-2004 and represented the largest airline operating expense, accounting for between 30% and 40% of expenses for most airlines. Fuel prices decreased sharply in the second half of 2008 as demand for oil declined worldwide, but then increased as demand increased.

Between early 2011 and mid-2014, aviation fuel prices were relatively stable, partly as a result of increased oil supply from U.S. domestic production. As of mid-2014, average fuel prices were approximately three times those prevailing at the end of 2003. Beginning in mid-2014, an imbalance between worldwide supply and demand resulted in a precipitous decline in the price of oil and aviation fuel. Decreased demand from China and other developing countries, combined with the lifting of trade sanctions on Iran and a continued surplus in the worldwide supply, notwithstanding an OPEC agreement to reduce oil production, resulted in further reductions in fuel prices in 2015 and 2016. The average price of aviation fuel at the end of 2016 was approximately 50% of the price at mid-2014. The reduction in fuel prices is having a positive effect on airline profitability, and the decline in oil prices has far reaching implications for the global economy.

Airline industry analysts hold differing views on how oil and aviation fuel prices may change in the near term, although, absent unforeseen disruptions, prices are expected to remain low compared to prices during the 2011-14 period for some time. However, there is widespread agreement that fuel prices are likely to increase over the long term as global energy demand increases in the face of finite oil supplies that are becoming more expensive to extract.

Aviation fuel prices will continue to affect airfares, passenger numbers, airline profitability, and the ability of airlines to provide service. Airline operating economics will also be affected as regulatory costs are imposed on the airline industry as part of efforts to reduce aircraft emissions contributing to global climate change.

**Capacity of the national air traffic control system.** Demands on the national air traffic control system have, in the past, caused delays and operational restrictions affecting airline schedules and passenger traffic. The FAA is implementing its Next Generation Air Transportation System (NextGen) air traffic management programs to modernize and automate the guidance and communications equipment of the air traffic control system and enhance the use of airspace and runways through improved air navigation aids and procedures. Since 2007, airline traffic delays nationwide have decreased as a result of reduced numbers of aircraft operations (down approximately 20% between 2007 and 2015), driven in part by the increased average size of aircraft. However, as airline travel increases in the future, flight delays and restrictions can be expected.

**Capacity of Boston-Logan International Airport.** In addition to any future constraints that may be imposed by the national air traffic control and national airport systems, future growth in airline traffic at the Airport will depend in part on the capacity of the Airport itself. Authority management believes that current facilities at the Airport (i.e., airfield, terminal, parking, and Airport access facilities), in conjunction with the projects to be undertaken as part of the FY 2017-FY 2021 Capital Program, will provide sufficient airside, terminal, and landside capacity to accommodate the assumed level of passenger traffic that underlies the financial forecasts through FY 2021 (the final year of the forecast period).

#### **Airport Properties Revenues**

As shown in Table 2, the Authority's Airport Properties revenues increased from \$572.1 million in FY 2015 to \$600.5 million in FY 2016, an overall increase of 5.0%. Airport Properties revenues are expected to increase 6.6%, to \$640.2 million in FY 2017, based on nine months of actual data for FY 2017. The Authority has developed a conservative FY 2018 budget for Airport Properties revenues, with anticipated reductions for many items in FY 2018 as compared to FY 2017, given that FY 2017 was a particularly strong year in terms of passenger enplanements and revenues. Airport Properties revenues are forecast to increase at a compound annual growth rate (CAGR) of 4.1% from \$600.5 million in FY 2016 to \$734.5 million in FY 2021.

**Logan airline revenues.** The Authority expects to continue to calculate airline rents and fees generally on the basis of existing rate-making procedures, as documented in the Authority's financial model for calculating annual airlines rates and charges, and the Authority's document titled "Preliminary FY17 Commercial Aviation Rates." Terminal rentals are calculated using a "commercial compensatory" methodology, with the Authority recovering a portion of the allocated operating expenses and capital costs for each terminal through terminal rental revenues. Where applicable, the Authority's lease agreements with air carriers for terminal space at the Airport state that the Authority may revise rental rates periodically, at the Authority's discretion, to recover the actual direct and indirect capital and operating costs for such leased space. The landing fee rate is calculated on a "cost center residual" basis, with the allocated operating and capital costs for the airfield area, net of certain revenues generated from miscellaneous activities on the airfield, divided by the scheduled airlines' landed weights.

Logan airline revenues, including landing fees, terminal rentals, and tenant aircraft parking, accounted for 41.6% of Airport Properties revenues in FY 2016. This category is forecast to increase at a CAGR of 5.6% from \$271.2 million in FY 2017 to \$337.6 million in FY 2021, primarily driven by increases to the airline cost base associated with projects in the FY 2017-FY 2021 Capital Program.

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**Table 2**  
**ACTUAL AND FORECAST AIRPORT PROPERTIES REVENUES**  
Massachusetts Port Authority  
(For the 12 months ending June 30, \$ in thousands)

	Actual		FY 2017 (a)	FY 2018	Forecast		
	FY 2015	FY 2016			FY 2019	FY 2020	FY 2021
<b>Logan Revenues</b>							
Landing Fees (b)	\$ 101,123	\$ 104,489	\$ 110,225	\$ 119,065	\$ 124,194	\$ 129,632	\$ 133,617
Automobile Parking Fees	\$ 148,653	\$ 154,068	\$ 165,786	\$ 176,065	\$ 179,377	\$ 189,255	\$ 191,094
Utility Fees	\$ 18,274	\$ 17,960	\$ 16,438	\$ 17,769	\$ 18,124	\$ 18,487	\$ 18,856
Terminal Rentals (b)	\$ 133,939	\$ 142,237	\$ 158,026	\$ 180,609	\$ 185,460	\$ 194,843	\$ 200,751
<b>Non-Terminal Building &amp; Ground Rents</b>							
Hangar/Cargo Rentals	\$ 20,268	\$ 19,493	\$ 19,709	\$ 19,882	\$ 20,157	\$ 20,428	\$ 20,706
Other Building Rentals	5,869	7,169	7,668	7,091	7,281	7,437	7,597
Ground Rent	15,779	18,338	17,156	18,711	19,054	19,335	19,621
Fuel Farm	1,573	1,588	1,600	1,614	1,627	1,640	1,653
Ramp & Apron	2,267	2,728	2,916	2,802	2,857	2,902	2,948
Subtotal: Non-Terminal Building & Ground Rents	\$ 45,756	\$ 49,317	\$ 49,051	\$ 50,099	\$ 50,976	\$ 51,742	\$ 52,525
<b>Concessions</b>							
Terminal Concessions (c)	\$ 51,018	\$ 55,345	\$ 61,068	\$ 56,331	\$ 57,095	\$ 57,835	\$ 58,592
Rental Car	30,272	31,268	33,221	31,737	33,032	33,534	34,044
Subtotal: Concessions	\$ 81,291	\$ 86,614	\$ 94,289	\$ 88,069	\$ 90,127	\$ 91,369	\$ 92,636
<b>Other</b>							
Shuttle Bus	\$ 15,717	\$ 18,009	\$ 19,239	\$ 19,069	\$ 19,172	\$ 19,277	\$ 19,383
Tenant Aircraft Parking (b)	2,655	3,235	2,922	2,655	3,235	3,235	3,235
Security Checkpoint Reimbursement	3,867	2,649	2,330	1,706	1,706	1,706	1,706
Miscellaneous Revenues	7,151	8,139	7,791	6,263	6,317	6,427	6,523
Subtotal: Other	\$ 29,389	\$ 32,032	\$ 32,283	\$ 29,693	\$ 30,429	\$ 30,644	\$ 30,846
<b>Subtotal: Logan Revenues</b>	\$ 558,425	\$ 586,716	\$ 626,099	\$ 661,368	\$ 678,688	\$ 705,972	\$ 720,324
<b>Hanscom and Worcester Revenues</b>	\$ 13,690	\$ 13,767	\$ 14,128	\$ 13,606	\$ 13,917	\$ 14,068	\$ 14,222
<b>Airport Properties Revenues</b>	\$ 572,115	\$ 600,483	\$ 640,227	\$ 674,974	\$ 692,606	\$ 720,040	\$ 734,546
<i>Percentage change</i>		5.0%	6.6%	5.4%	2.6%	4.0%	2.0%
<b>Logan Airline Revenues (b)</b>	\$ 237,718	\$ 249,960	\$ 271,173	\$ 302,329	\$ 312,889	\$ 327,711	\$ 337,602
<i>Percentage change</i>		5.1%	8.5%	11.5%	3.5%	4.7%	3.0%

- (a) Reflects actual data for the nine months ended March 31, 2017, and budgeted data for the remaining three months of FY 2017.
- (b) Logan Airline Revenues includes Landing Fees, Terminal Rentals, and Tenant Aircraft Parking. (The rental revenues for Terminal A included in the terminal rental totals shown in this table reflect the portion of Terminal A rentals that are revenues of the Authority. Pursuant to an amendment to the Trust Agreement related to the issuance of the Authority's Special Facilities Revenue Bonds, Series 2001, which were issued to finance the development of Terminal A, rental revenues generated in Terminal A are split between the Authority and holders of the Special Facilities Revenue Bonds, Series 2001.)
- (c) Terminal Concessions includes Terminal Concessions, Ground Transportation, and Other Commissions.

Source: Massachusetts Port Authority.



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**Automobile parking fees.** Automobile parking fees accounted for 25.7% of Airport Properties revenues in FY 2016. Automobile parking fees are forecasted to increase at a CAGR of 3.6% from \$165.8 million in FY 2017 to \$191.1 million in FY 2021, primarily driven by increased parking rates offset by a slight decrease in total parking exits due to the higher parking rates and the initiation of TNC operations at the Airport in February 2017. The Authority's Board has approved increases of \$3 in the daily parking rates for all of Logan Airport's parking facilities to go into effect on July 1, 2017, and July 1, 2019. The daily parking rate in the central parking facility is scheduled to increase from \$32 in FY 2017 to \$38 by July 1, 2019, an 18.8% increase. Parking rates are not expected to be adjusted at the Authority's off-Airport Logan Express lots during the forecast period.

**Concessions.** Concessions accounted for 14.4% of Airport Properties revenues in FY 2016. Concessions include retail, duty free and food & beverage concessions in the terminals, rental car privilege fees and certain ground transportation fees and charges. This revenue category is forecasted to remain relatively stable over the course of the forecast period, decreasing slightly from \$94.3 million in FY 2017 to \$92.6 million in FY 2021.

The forecasted stability in terminal concessions revenues is due to a number of factors, including the fact that the Authority conservatively budgeted for FY 2018 revenues in this category compared to estimated full FY 2017 revenues (which reflected a particularly strong year with respect to passenger activity at the Airport), as well as the expected temporary removal of retail space during construction. In April 2017, the Authority announced its intent to enter into a new 10-year contract with MarketPlace Logan LLC for the management of the majority of terminal concession operations at the Airport. (Currently, the four terminals at the Airport are managed under multiple concessions contracts.) The development of enhanced concession facilities under the new contract is expected to begin in mid-2018. Authority management expects that consolidating concessions management under a single contract with an industry leader will ensure consistency, continuity, and choice for the passengers traveling through the Airport. No enhancements to per passenger spending rates on terminal concessions resulting from the new MarketPlace contract have been assumed for purposes of this forecast.

The Authority has reflected moderated revenues from rental car activities in FY 2018 compared to FY 2017 to take account of the initiation of service by TNC operations at the Airport.

**Non-terminal building and ground rents.** Non-terminal building and ground rents accounted for 8.2% of Airport Properties revenues in FY 2016. Non-terminal building and ground rents are comprised of hangar/cargo rentals, other building rentals, ground rent, fuel farm, and ramp and apron revenues. A decrease in revenue for this category is anticipated for FY 2017 as compared to FY 2016, due to a decrease in ground rent at Logan Airport. Overall, non-terminal building and ground rent revenue is forecasted to increase at a CAGR of 1.7%, from \$49.1 million in FY 2017 to \$52.5 million in FY 2021.

**Utility fees.** Utility fees accounted for 3.0% of Airport Properties revenues in FY 2016. Utility fees are forecasted to increase at a CAGR of 3.5%, from \$16.4 million in FY 2017 to \$18.9 million in FY 2021, primarily driven by forecasted market rate changes.

**Other.** Other revenues accounted for 4.8% of Airport Properties revenues in FY 2016. Other revenues include shuttle bus fees, security checkpoint reimbursement, and other miscellaneous

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revenues. Tenant aircraft parking is included in Logan airline revenues. This category (excluding tenant aircraft parking, which is a component of airline revenues) is forecasted to decrease from \$29.4 million in FY 2017 to \$27.6 million in FY 2021, primarily driven by a decline in security reimbursements and miscellaneous revenues.

### **Airport Properties Operating Expenses**

The Authority incurs operating expenses when maintaining, repairing and operating the Airport Properties. Such expenses generally include salaries and benefits, materials and supplies, repair, maintenance, services, professional fees, utilities, insurance, and other miscellaneous expenses, as well as administrative expenses allocated to the Airport Properties. Operating expenses are allocated to each cost center, including airfield and terminal cost centers, for cost recovery purposes through, in the case of airfield and terminal expenses, the airline rentals and fees.

As shown in Table 3, Airport Properties operating expenses increased by 0.8% from \$326.4 million in FY 2015 to \$329.0 million in FY 2016. Airport Properties operating expenses are expected to increase 7.9% to \$354.8 million in FY 2017, and by 7.1% to \$380.1 million in FY 2018. These increases relate to a number of factors including new facilities coming into service, the addition of staff in certain operational areas, and higher anticipated electricity costs. Airport Properties operating expenses are forecasted to increase at a CAGR of 5.5% from \$354.8 million in FY 2017 to \$440.1 million in FY 2021.

**Logan Airport expenses.** In FY 2016, the primary expense allocations for Logan operating expenses were Terminal Building (38.3% of Logan Airport operating expenses), Landing Field (22.4%), Automobile Parking (18.3%), and Non-aeronautical (12.4%). Logan operating expenses are forecasted to increase at a CAGR of 5.3% from \$333.2 million in FY 2017 to \$410.1 million in FY 2021, reflecting changes in baseline expenses, as well as incremental operating expenses for new capital facilities.

**Hanscom and Worcester.** Hanscom Field and Worcester Regional Airport accounted for 6.6% of total Airport Properties operating expenses in FY 2016. Expenses at Hanscom and Worcester are forecasted to increase at a CAGR of 8.5% from \$21.6 million in FY 2017 to \$30.0 million in FY 2021.

**Table 3**  
**ACTUAL AND FORECAST AIRPORT PROPERTIES OPERATING EXPENSES**  
Massachusetts Port Authority  
(For the 12 months ending June 30, \$ in thousands)

	Actual		FY 2017 (a)	FY 2018	Forecast		
	FY 2015	FY 2016			FY 2019	FY 2020	FY 2021
<b>Logan Expenses</b>							
Personnel Expenses	\$ 125,393	\$ 127,809	\$ 141,600	\$ 146,980	\$ 155,749	\$ 165,322	\$ 175,034
Repair & Materials	17,978	17,046	17,987	19,745	19,952	20,679	21,433
Services	36,641	37,448	39,095	42,853	44,567	46,350	48,204
Professional Fees	43,013	43,668	46,149	48,119	48,119	50,044	52,046
Utilities	26,017	25,072	27,562	31,798	32,434	33,083	33,745
Other and Authority Wide Allocations	58,325	56,350	60,784	66,346	72,286	76,173	79,617
<b>Subtotal: Logan Expenses</b>	<b>\$ 307,367</b>	<b>\$ 307,393</b>	<b>\$ 333,177</b>	<b>\$ 355,842</b>	<b>\$ 373,108</b>	<b>\$ 391,651</b>	<b>\$ 410,078</b>
<b>Subtotal: Hanscom and Worcester Expenses</b>	<b>\$ 19,070</b>	<b>\$ 21,561</b>	<b>\$ 21,647</b>	<b>\$ 24,248</b>	<b>\$ 27,485</b>	<b>\$ 28,721</b>	<b>\$ 29,980</b>
<b>Airport Properties Operating Expenses</b>	<b>\$ 326,437</b>	<b>\$ 328,954</b>	<b>\$ 354,823</b>	<b>\$ 380,090</b>	<b>\$ 400,592</b>	<b>\$ 420,371</b>	<b>\$ 440,058</b>
<i>Percentage change</i>		<i>0.8%</i>	<i>7.9%</i>	<i>7.1%</i>	<i>5.4%</i>	<i>4.9%</i>	<i>4.7%</i>
<b>Logan Expenses by Cost Center</b>							
Landing Field			\$ 76,072	\$ 80,539	\$ 83,376	\$ 87,407	\$ 91,575
Terminal Building			125,000	132,927	137,358	143,529	149,906
Automobile Parking			62,388	66,093	68,403	71,674	75,058
Non-aeronautical (b)			40,672	45,362	52,035	55,703	58,754
Bag Screening Facilities			12,536	13,303	13,758	14,397	15,057
Rental Car Center			7,524	8,010	8,273	8,636	9,012
Airline Support			7,318	7,841	8,076	8,390	8,714
Regional Carrier and General Aviation Facilities			1,666	1,768	1,829	1,914	2,002
<b>Subtotal: Logan Expenses by Cost Center</b>			<b>\$ 333,177</b>	<b>\$ 355,842</b>	<b>\$ 373,108</b>	<b>\$ 391,651</b>	<b>\$ 410,078</b>

(a) Reflects actual data for the nine months ended March 31, 2017, and budgeted data for the remaining three months of FY 2017.

(b) Includes expenses for other unrecoverable items, such as budget contingency.

Source: Massachusetts Port Authority.

### THE FY 2017-FY 2021 CAPITAL PROGRAM

The forecast of Airport Properties Net Revenues incorporates the impact on revenues and operating expenses of projects intended to be developed at the Authority's Airport Properties as part of the FY 2017-FY 2021 Capital Program (including projects that are proposed to be funded with a portion of the proceeds of the Series 2017 Bonds, and the Authority's anticipated future bonds expected to be issued under the terms of the 1978 Trust Agreement). Other funding sources for projects in the FY 2017-FY 2021 Capital Program include federal grants, PFCs, CFCs, the Authority's internally generated capital, and tenant and third party financing. The FY 2017-FY 2021 Capital Program for the Authority's Airport Properties is summarized in Table 4. (The Authority's overall program also includes \$1.8 billion of projects for its non-Airport Properties, \$1.3 billion of which is associated with private and third party funded projects.)

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**Table 4**  
**SUMMARY OF FY 2017-FY 2021 CAPITAL PROGRAM FOR AIRPORT PROPERTIES**  
Massachusetts Port Authority  
(\$ in thousands)

	Funding Source							Subtotal excluding Private	Private capital	Total
	Series 2017 Bonds	Future Bonds (a)	Prior Bonds	Grants (b)	Future PFC Bonds	PFC Pay-Go	Authority Capital & Other (c)			
<b>Logan</b>										
<b>Airside</b>										
Runway 9-27 Rehab	\$ -	\$ -	\$ -	\$ 4,997	\$ -	\$ 14,003	\$ -	\$ 19,000	\$ -	\$ 19,000
Taxiway C3 Pavement Rehab and New Bypass	-	-	-	-	-	7,500	-	7,500	-	7,500
Replace Runway 4R Approach Light Pier	-	-	-	-	-	5,000	-	5,000	-	5,000
Taxiway D, D1, MS Rehab	-	-	-	-	-	5,600	-	5,600	-	5,600
A380 Airfield Improvements	-	-	-	-	-	9,097	-	9,097	-	9,097
Resurface North Cargo Apron	-	-	-	2,135	-	4,865	-	7,000	-	7,000
Other Airside Projects	-	-	465	21,671	-	35,832	93,661	151,629	-	151,629
<b>Subtotal: Airside</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 465</b>	<b>\$ 28,803</b>	<b>\$ -</b>	<b>\$ 81,897</b>	<b>\$ 93,661</b>	<b>\$ 204,825</b>	<b>\$ -</b>	<b>\$ 204,825</b>
<b>Terminal, Landside, and Other</b>										
Terminal E Modernization - Phase 1	\$ -	\$ 240,610	\$ -	\$ -	\$ 129,296	\$ -	\$ 18,370	\$ 388,276	\$ -	\$ 388,276
Terminal E Renovations And Enhancements	-	-	96,623	-	-	-	843	97,466	-	97,466
Terminal B Optimization	77,500	-	25,000	-	42,000	-	20,500	165,000	-	165,000
Post Security Concourse - Gates 37/38 (Term. B)	-	-	-	-	-	24,997	-	24,997	-	24,997
Checked Baggage Inspection System (CBIS) Replacement/Optimization	-	-	-	-	-	17,960	-	17,960	-	17,960
Gates 40-42 Connector (Terminal C)	-	-	-	-	-	-	40,000	40,000	-	40,000
Terminal C Canopy & Upper Deck	-	-	-	-	-	-	30,000	30,000	-	30,000
Parking - 1000 Spaces	-	70,000	-	-	-	-	-	70,000	-	70,000
Terminal C Roadways	-	49,672	-	-	-	-	-	49,672	-	49,672
Parking - 4000 Spaces	-	44,000	-	-	-	-	-	44,000	-	44,000
Central Heating Plant Upgrade	-	-	15,966	-	-	-	16,000	31,966	-	31,966
HVAC Equipment Replacement Program	-	-	13,231	-	-	-	12,664	25,895	-	25,895
Other Projects	12,235	-	20,418	-	-	7,960	230,465	271,078	120,000	391,078
<b>Subtotal: Terminal, Landside, and Other</b>	<b>\$ 89,735</b>	<b>\$ 404,282</b>	<b>\$ 171,237</b>	<b>\$ -</b>	<b>\$ 171,296</b>	<b>\$ 50,917</b>	<b>\$ 368,842</b>	<b>\$ 1,256,309</b>	<b>\$ 120,000</b>	<b>\$ 1,376,309</b>
<b>Subtotal: Logan</b>	<b>\$ 89,735</b>	<b>\$ 404,282</b>	<b>\$ 171,702</b>	<b>\$ 28,803</b>	<b>\$ 171,296</b>	<b>\$ 132,814</b>	<b>\$ 462,503</b>	<b>\$ 1,461,134</b>	<b>\$ 120,000</b>	<b>\$ 1,581,134</b>
<b>Hanscom &amp; Worcester</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 18,958</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 88,664</b>	<b>\$ 107,622</b>	<b>\$ 59,700</b>	<b>\$ 167,322</b>
<b>Total Airport Properties</b>	<b>\$ 89,735</b>	<b>\$ 404,282</b>	<b>\$ 171,702</b>	<b>\$ 47,761</b>	<b>\$ 171,296</b>	<b>\$ 132,814</b>	<b>\$ 551,168</b>	<b>\$ 1,568,757</b>	<b>\$ 179,700</b>	<b>\$ 1,748,457</b>

(a) Future bonds to be issued under the 1978 Trust Agreement.  
(b) Including AIP entitlement and discretionary grants, and TSA grants.  
(c) Funding from the Authority's Improvement & Extension Fund and Maintenance Reserve Fund, CFCs, and the Terminal A Maintenance Reserve Fund.

Source: Massachusetts Port Authority.

In the event that such FY 2017-FY 2021 Capital Program projects are not implemented, the associated revenues and operating expenses would not be realized. See the section of Appendix A to the Official Statement titled "Capital Program" for a detailed discussion of the FY 2017-FY 2021 Capital Program costs and funding sources.

**PASSENGER FACILITY CHARGES**

PFC revenues of the Authority consist of PFCs paid by passengers enplaned at the Airport (and include interest income earned thereon) and are pledged to the payment of debt service on bonds issued under the terms of the Authority's PFC Trust Agreement. These PFC revenues are not Revenues of the Authority as defined in the Authority's 1978 Trust Agreement, and thus, PFCs are not pledged to the payment of debt service on the Series 2017 Bonds or any of the Authority's other currently

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outstanding Bonds issued under the 1978 Trust Agreement. See the discussion below of the proposed amendment to the 1978 Trust Agreement which would, if enacted, impact the treatment of PFC revenues.

The Authority generated \$71.0 million of PFC revenues from activities at Logan Airport during FY 2016, and forecasts \$72.9 million of PFC revenues during FY 2017 (including associated restricted interest income). The Authority is forecasting PFC revenues of \$78.0 million in FY 2021, as shown in Table 5.

**Table 5**  
**ACTUAL AND FORECAST PASSENGER FACILITY CHARGE REVENUES**  
Boston-Logan International Airport  
(For the 12 months ending June 30, in thousands except percentages and Net PFC Collection Level)

	Actual		Forecast				
	FY 2015	FY 2016	FY 2017 (a)	FY 2018	FY 2019	FY 2020	FY 2021
<b>PFC revenues</b>							
Enplaned Passengers (b)	16,067	17,335	18,391	18,942	19,321	19,514	19,710
Percent of Passengers Paying a PFC	93.3%	92.9%	90.0%	90.0%	90.0%	90.0%	90.0%
Net PFC Collection Level	\$ 4.39	\$ 4.39	\$ 4.39	\$ 4.39	\$ 4.39	\$ 4.39	\$ 4.39
Annual PFC Collections from Airlines	65,807	70,718	72,662	74,841	76,338	77,102	77,873
PFC Restricted Interest Income	82	277	262	87	86	87	87
PFC Revenues Plus Interest Income	\$ 65,889	\$ 70,995	\$ 72,924	\$ 74,929	\$ 76,424	\$ 77,189	\$ 77,960
<i>Percentage change</i>		7.8%	2.7%	2.7%	2.0%	1.0%	1.0%
<p>(a) Reflects actual data for the nine months ended March 31, 2017, and budgeted data for the remaining three months of FY 2017.</p> <p>(b) Excludes general aviation passengers.</p> <p>Source: Massachusetts Port Authority.</p>							

At various times since 1999, the Authority has issued PFC Revenue Bonds on a “stand alone” basis under the terms of its PFC Trust Agreement, which bonds are secured only by PFC revenues. Subsequent to the payment of its scheduled PFC Revenue Bond principal payment on July 1, 2017, all PFC Revenue Bonds issued under the terms of the PFC Trust Agreement will have been paid off.

The Authority has received approval from the FAA to levy a PFC at the \$4.50 level per PFC-eligible enplaned passenger at the Airport. The Authority currently has approvals to collect and spend a total of \$1.67 billion in PFC revenue under the terms of ten separate FAA-approved PFC applications (as amended), with a projected PFC charge expiration date of May 1, 2026. PFC revenues are used to fund capital project costs on a pay-as-you-go basis, to pay debt service on the PFC Revenue Bonds and a portion of the special facility bonds debt service related to Terminal A, and to pay interest and repay principal on commercial paper issued to fund PFC-eligible project costs. From inception of the Authority’s PFC program in 1993 through March 31, 2017, a total of \$1.1 billion in PFC revenue has

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been collected by the Authority, including interest income on certain funds and accounts established under the Authority's PFC Trust Agreement.

The Authority intends to partially fund with PFCs one of the projects included in the Series 2017 Bond issue – Terminal B Optimization. This project has not yet been included in any of the Authority's PFC applications. The Authority intends to seek FAA approval for approximately \$42 million in PFC funding (plus associated PFC-funded interest and financing costs) for this project as part of its eleventh PFC application. Additionally, other terminal and airfield projects will be included in the eleventh PFC application, which is expected to total over \$100 million in PFC funding requests. The Authority expects to initiate its eleventh PFC application during Fall 2017, and to obtain FAA approval for PFC funding for this project in 2018. If the Terminal B project is not approved for PFC funding, or if the approval amount is less than the Authority's PFC funding request, then the Authority would likely fund the difference as part of a future bond issue under the 1978 Trust Agreement.

As noted above, the Authority's bonds issued under the terms of its PFC Trust Agreement will fully mature on July 1, 2017. The Authority expects to continue to leverage its PFC revenue stream after that date, and is currently studying alternatives for accomplishing this objective in the most efficient and effective way. Future leveraging of the PFC revenue stream may be partially or wholly undertaken under the terms of the 1978 Trust Agreement, in accordance with the terms of a pending amendment to the 1978 Trust Agreement, as described in Appendix A of the Official Statement for the Series 2017 Bonds, to which this review is attached.

### **TENANT AND THIRD PARTY FUNDED PROJECTS**

The Authority intends to fund certain capital projects using funds from tenants or third parties, or from revenue sources that are not included in Revenues, as defined in the 1978 Trust Agreement. There are ten such projects in the Authority's FY 2017-FY 2021 Capital Program related to the Airport Properties; two projects at Logan Airport – airline improvements in Terminal C related to the JetBlue expansion (\$100 million), and a vendor delivery inspection station by a third party concessionaire (\$20 million) – and eight projects totaling \$59.7 million at the Authority's other airports (Worcester Regional Airport and Hanscom Field). There are also third party funded projects in the Authority's non-aviation properties. Generally, the Authority would not undertake tenant and third party projects if funding from those sources was not available.

### **THE AUTHORITY'S STRATEGIC PLAN**

The Authority completed a unified Strategic Plan for all of its facilities, which was adopted by the Board, in November 2014. With respect to its Airport Properties, the key goal of the Strategic Plan was to identify the necessary improvements to its airside, landside, and ground access facilities that would allow Logan Airport to serve the needs of its rapidly growing passenger base. Given the robust increase in aviation activity at the Airport since the Strategic Plan was completed, there is a need to implement certain of the strategic initiatives identified as part of the planning process on an expedited basis. Several of these initiatives are included in the FY 2017-FY 2021 Capital Program. With respect to Logan Airport, key initiatives include, among others, the implementation of terminal improvements (including additional gates and other improvements to accommodate international activity in Terminal E), and ground access and curbside improvements at the Airport (including the provision of additional parking facilities, subject to the amendment of the portion of the

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Massachusetts State Implementation Plan (“SIP”) governing the supply of public parking spaces at the Airport that is approved by U.S. Environmental Protection Agency).

Authority management and staff will continue to work to develop specific business plans designed to address and implement the strategic initiatives across all of its properties. As detailed business plans for each strategic initiative are developed, refined, and approved in the context of the then-current operating environment and aviation activity levels, those projects will become part of future five-year rolling capital programs to be approved by the Authority’s Board.

### **WORCESTER REGIONAL AIRPORT AND HANSCOM FIELD**

The Authority has owned and operated Worcester Regional Airport, a commercial service airport located in Worcester, Massachusetts, since 2010. Prior to that, the Authority was responsible for operating the facility for a number of years, under ownership by the City of Worcester. JetBlue commenced scheduled air service at the airport in November 2013, and is currently the sole commercial service airline operating at the airport.

Hanscom Field, located principally in the Town of Bedford, Massachusetts, is a general aviation reliever airport for Logan Airport. The Authority has owned and operated Hanscom Field since 1974.

Taken together, Worcester Regional Airport and Hanscom Field accounted for approximately 2.3% of the Authority’s Airport Properties revenues and 6.6% of its Airport Properties operating expenses in FY 2016.

### **SUMMARY OF FORECAST**

Exhibit A presents forecast Airport Properties revenues and operating expenses, the resultant forecast of Airport Properties Net Revenues for FY 2017 through FY 2021, and the key assumptions that are significant to the forecasts, as prepared by Authority management. These forecasts assume that the airlines currently providing significant levels of service at the Airport will continue to provide uninterrupted service during the forecast period. The forecasts shown in Exhibit A are consistent with the sections of the table entitled “Forecasted Operating Results and Debt Service Coverage Under the 1978 Trust Agreement” (as included in the “Selected Financial Data” section of Appendix A of the Official Statement), which relate to Airport Properties revenues and operating expenses. The information presented in Exhibit A is at a greater level of detail than that presented in the Official Statement, and separately presents information for the Airport, Hanscom Field, and Worcester Regional Airport. Additionally, Exhibit A relates only to the Authority’s Airport Properties, while the table in the Official Statement encompasses all of the Authority’s properties. To the extent that line items differ between Exhibit A and the Authority’s table in Appendix A with respect to the Airport Properties, such variance is due to differences in the methods used to aggregate revenues and operating expenses.

The Authority prepared these financial forecasts on the basis of information and assumptions that were assembled by the Authority. As discussed earlier, LeighFisher assisted the Authority in formulating certain assumptions and developing the forecasts of Airport Properties Net Revenues. The forecasts reflect the Authority’s expected course of action during the forecast period and, in the Authority’s judgment, based upon the assumptions described herein, present fairly the Authority’s

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forecast financial results of the Airport Properties; however, there can be no assurance that such forecast results will be realized.

In addition to the payment of debt service on the Authority's Bonds issued under the terms of the 1978 Trust Agreement, the Authority is required to make deposits to the PILOT Fund and the Maintenance Reserve Fund and to pay subordinate debt service on private placement debt issued to fund the acquisition of certain parcels of land, as well as make principal and interest payments on the Authority's outstanding commercial paper notes. These amounts must be paid from the Net Revenues of the Airport Properties and other facilities. Our review does not address the amount of such payments nor assess the adequacy of the Authority's forecast Net Revenues to make such payments, as they are subordinate to the payment of debt service on the Series 2017 Bonds and the Authority's other Bonds issued under the terms of the 1978 Trust Agreement.

### **SENSITIVITY TEST**

To test the sensitivity of the financial forecasts to hypothetical lower levels of air traffic activity, the Authority developed a sensitivity analysis projection in addition to the base forecast. The sensitivity analysis projection should not be considered a forecast of expected future results.

Exhibit B presents a summary of projected Aviation Properties Net Revenues under the hypothetical assumption that total passenger numbers decrease by 18.1% in FY 2019 compared with the prior year, with a subsequent rebound over the next two years – a 2.1% increase in FY 2020, followed by an 8.7% increase in FY 2021. This is proportionate to the trend actually experienced at the Airport between FY 2001 and FY 2004, in the aftermath of the terrorist attacks on September 11, 2001. Passenger activity at the Airport has followed this general trend of quickly rebounding following a sharp decline in each of the last three economic downturns – the economic recessions of the early 1990s, the early 2000s, and 2008 and 2009.

All other assumptions under this sensitivity test are the same as for the base forecast, including the assumption that annual operating expenses are unchanged in the sensitivity test. Under the sensitivity test, Airport Properties Net Revenues are projected to be 16.9% below the base forecast level in FY 2019, 16.5% below the base forecast level in FY 2020, and 11.3% below the base forecast level in FY 2021. While airline revenues are approximately the same due to the cost recovery nature of the airline ratemaking methodology used at the Airport, the nonairline revenues that are based on passenger throughput (such as terminal concessions, parking, and rental car) are lower.

It should be noted that, in the eventuality that Airport passenger totals drop significantly, the Authority would likely undertake a program of operating cost reductions and potentially increases in Airport rates and charges, as was the case in the aftermath of the September 11, 2001 terrorist attacks.

### **ASSUMPTIONS UNDERLYING THE FORECASTS**

In our opinion, the assumptions underlying the Authority's base case financial forecasts provide a reasonable basis for the forecasts of Airport Properties Net Revenues and we believe that such forecasts appropriately reflect such assumptions. To the best of our knowledge, we believe that the Authority has taken into account all relevant factors material to the Airport Properties Net Revenues forecasts. We offer no opinion with regard to the forecasts of non-Airport Properties Net Revenues.



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Any forecast is subject to uncertainties. Inevitably, some assumptions will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material. Neither LeighFisher nor any person acting on our behalf makes any warranty, expressed or implied, with respect to the information, assumptions, forecasts, opinions, or conclusions disclosed in this report. We have no responsibility to update this report for events and circumstances occurring after the date of our review.

\* \* \* \* \*

We appreciate the opportunity to serve the Authority as the Airport Properties financial consultant on this financing.

Respectfully submitted,



LeighFisher

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Attachment

KEY ASSUMPTIONS AND FACTORS UNDERLYING FORECAST AIRPORT  
PROPERTIES REVENUES AND OPERATING EXPENSES

Massachusetts Port Authority

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**KEY ASSUMPTIONS AND FACTORS UNDERLYING FORECAST AIRPORT PROPERTIES  
REVENUES AND OPERATING EXPENSES**  
Massachusetts Port Authority

**EXHIBIT A: BASE FORECAST**

**Passenger Traffic and Airline Operations**

1. The total number of passengers at Boston-Logan International Airport (the Airport) was 34.8 million in FY 2016 (excluding general aviation passengers). Passengers are forecast to total 36.9 million in FY 2017 (based on actual data for the first nine months of FY 2017). Passenger totals are forecast to increase by 3.0% in FY 2018, by 2.0% in FY 2019, and by 1.0% in FY 2020 and FY 2021, to approximately 39.6 million passengers in FY 2021, the last year of the forecast period.
2. The airlines currently providing significant levels of service at the Airport (including American, Delta, JetBlue, Southwest, and United) will continue to provide significant service at the Airport. There will be no sudden, significant reduction in passenger levels at the Airport because of airline mergers or liquidations, or for other reasons.

**Bond Issuance and Debt Service**

3. The new money portion of the Authority's Series 2017 Bonds are assumed to be issued in the aggregate principal amount of \$98.0 million (yielding \$91.0 million of net proceeds available to fund project costs), at an interest rate of 4.5%, and with no capitalized interest period. (The Series 2017 Bonds are also expected to include a refunding component, the debt service for which is not reflected in this report.)
4. During the forecast period, three further bond issues under the terms of the 1978 Trust Agreement are assumed to occur to partially fund projects included in the FY 2017-FY 2021 Capital Program:
  - Series 2018 Bonds are assumed to be issued on or about July 1, 2018, in the aggregate principal amount of \$214.6 million (yielding \$196.9 million of net proceeds available to fund project costs), with a 6.0% interest rate and no capitalized interest.
  - Series 2019 Bonds are assumed to be issued on or about July 1, 2019, in the aggregate principal amount of \$136.3 million (yielding \$125.0 million of net proceeds available to fund project costs), with a 6.0% interest rate and no capitalized interest.
  - Series 2020 Bonds are assumed to be issued on or about July 1, 2020, in the aggregate principal amount of \$102.2 million (yielding \$93.7 million of net proceeds available to fund project costs), with a 6.0% interest rate and no capitalized interest.

The Authority may undertake future PFC-related debt issuance under the 1978 Trust Agreement. For purposes of this analysis, it was assumed that a PFC-related bond issue would be undertaken in July 2019 in the aggregate principal amount of \$200.5 million (yielding \$171.3 million of net proceeds available to fund project costs), with a 6.0% interest rate and no capitalized interest. Proceeds would be used to fund a portion of two projects – Terminal B Optimization and Terminal E Modernization Phase 1.

## **The PFC Program**

5. The PFC Program will continue to be implemented in accordance with the Authority's ten approved PFC applications. The Authority will file its eleventh PFC Application during calendar year 2017, which will include the Terminal B Optimization project (one of the projects to be partially funded with a portion of the net proceeds of the Series 2017 Bonds).
6. PFC revenues generated during the forecast period will be sufficient to pay: (1) interest on, and principal of, outstanding commercial paper notes issued to finance certain PFC projects, (2) certain PFC project costs on a pay-as-you-go basis, (3) a portion of the debt service on the Series 2001 Special Facilities Revenue Bonds issued to fund the construction of Terminal A (as provided for in the Authority's sixth PFC application approved by the FAA), and (4) debt service on the PFC-related bonds projected to be issued in July 2019, as described in item 4 above. The Series 2007 PFC Bonds and the Series 2010 PFC Bonds are the Authority's only bonds currently outstanding under the PFC Trust Agreement, and have a final maturity of July 1, 2017. The Series 1999 PFC Bonds are no longer outstanding.
7. PFC revenues are not pledged to the payment of debt service on the Series 2017 Bonds or any other of the Authority's Bonds issued under the 1978 Trust Agreement. Such Bonds are payable from and secured by a pledge of the Authority's general Revenues (which exclude PFC revenues).
8. Under the terms of a pending amendment to the 1978 Trust Agreement that has not yet been approved by the required percentage (51%) of bondholders, the Authority may undertake future debt issues under the 1978 Trust Agreement using a PFC direct debt service offset structure (i.e., PFC revenues would be used to pay the associated debt service). For purposes of this analysis, it was assumed that PFC revenues would be used to pay annual debt service associated with a PFC-related bond issue to be undertaken in July 2019 (see item 4 and item 6 above).

## **Grants**

9. Based on discussions with the FAA, the Authority expects to receive Airport Improvement Program (AIP) entitlement and discretionary funds, and Voluntary Airport Low Emissions (VALE) grants, for all three airports totaling approximately \$47.8 million during the FY 2017 to FY 2021 period.
10. The Authority has been awarded approximately \$120.9 million in Transportation Security Administration (TSA) Other Transaction Agreement (OTA) grant funding for comprehensive upgrades to the checked baggage inspection system at the Airport, of which \$108.9 million has already been received by the Authority. Approximately \$18.0 million of the total will be spent during the FY 2017 to FY 2021 period.

## **Operating Expenses**

11. Operating expenses at the Airport Properties are projected to increase an average of approximately 5.5% per year during the forecast period – from FY 2017 through FY 2021. The operating expense forecasts account for the impact of projects included in the FY 2017-FY 2021 Capital Program that enter service prior to the end of FY 2021.

## **Airline Revenues**

12. The fees and charges paid by the airlines are primarily calculated on a cost recovery basis, reflecting both allocated capital and operating costs to facilities used by the airlines. The calculation of the landing fee, terminal rental rates for all four terminals, and the checked bag screening fee, will continue to reflect current rate-making practices. If the Authority's policy regarding peak-period pricing for the use of the airfield is triggered during the forecast period, it will have no impact on landing fee revenues or other revenues derived from rentals, fees, and charges paid by the airlines (i.e., the policy is "revenue neutral").
13. The Authority will include allocable asset amortization related to projects in the FY 2017- FY 2021 Capital Program in the airline cost basis for computing airline terminal rentals and landing fees.

## **Nonairline Revenues**

14. Successive increases of \$3 in the maximum daily parking rate at all on-Airport facilities are assumed to be implemented on July 1, 2017 (the start of the Authority's FY 2018); and July 1, 2019 (the start of FY 2020). The Authority's Board has already approved these increases. Parking rates at the Authority's off-Airport Logan Express parking lots are assumed to remain unchanged throughout the forecast period.
15. The rental car privilege fee will remain at 10% of annual gross rental car revenues and minimum annual guaranteed payments will remain unchanged.
16. The Authority conservatively budgeted for terminal concession revenues for FY 2018 compared to estimated full FY 2017 revenues (which reflected a particularly strong year with respect to passenger activity at the Airport). Beyond FY 2018, terminal concession revenues are assumed to generally increase in line with the increase in passenger enplanements and as a result of price increases, with adjustments for the expected temporary removal of retail space during construction.

For purposes of this analysis, no increase in per passenger spending on terminal concessions was assumed in connection with the new agreement with MarketPlace Logan LLC for the operation of concessions at all four of the Airport terminals.

## **Rental Car Center and the CFC Program**

17. The Authority incurs operating and routine maintenance expenses associated with the day-to-day operation of the Rental Car Center. Pursuant to its lease agreements with the rental car companies associated with the development of the Rental Car Center, the Authority collects building and ground rental revenues from the rental car companies operating in the Rental Car Center. The rental car companies also pay Common Airport Transit System (CATS) fees associated with their allocated share of the Authority's terminal-area busing system. The building and ground rental revenues, CATS fees, and the Authority's operating expenses for the Rental Car Center are all Revenues and operating expenses, as the case may be, under the terms of the 1978 Trust Agreement.
18. CFC revenues are not pledged to the payment of debt service on the Series 2017 Bonds or any other of the Authority's Bonds issued under the 1978 Trust Agreement. Such Bonds are payable from and secured by a pledge of the Authority's general Revenues (which exclude CFC revenues). Conversely, general Revenues of the Authority are not pledged to the

payment of debt service on the Authority's bonds issued under the terms of its CFC Trust Agreement.

#### **EXHIBIT B: SENSITIVITY TEST**

The underlying assumptions for Exhibit B (Projected Airport Properties revenues and operating expenses under the sensitivity test) are identical to those underlying the forecast shown in Exhibit A; except that annual passenger numbers during FY 2019 to FY 2021 are lower under the sensitivity case. This results in lower Logan Airport annual revenues (and lower annual revenues for the Airport Properties in total) under the sensitivity test than in the base forecast case.

No change in operating expenses is assumed for the sensitivity test, although if a significant reduction in aviation activity at the Airport were to occur, the Authority could implement a program of operating cost reductions as it did in the aftermath of the terrorist attacks of September 11, 2001, and potentially also increase certain categories of Airport rates and charges. Additionally, no deferrals of capital projects were assumed for the sensitivity test.



**Exhibit A**  
**BASE FORECAST**  
**FORECAST AIRPORT PROPERTIES NET REVENUES**  
Massachusetts Port Authority Airport Properties  
(for the 12 months ending June 30, passengers and \$ in thousands)

The forecasts presented in this exhibit were prepared by Authority management using information from the sources indicated and assumptions described in the accompanying text. Inevitably, some of the assumptions used to develop the Authority's forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
<b>Logan Airport Total Passengers (a)</b>	36,907	38,014	38,774	39,162	39,554
<i>Percentage change</i>		3.0%	2.0%	1.0%	1.0%
<b>Revenues</b>					
Landing Fees	\$ 110,225	\$ 119,065	\$ 124,194	\$ 129,632	\$ 133,617
Automobile Parking Fees	\$ 165,786	\$ 176,065	\$ 179,377	\$ 189,255	\$ 191,094
Utility Fees	\$ 16,438	\$ 17,769	\$ 18,124	\$ 18,487	\$ 18,856
Terminal Rentals (b)	\$ 158,026	\$ 180,609	\$ 185,460	\$ 194,843	\$ 200,751
Non-Terminal Building & Ground Rents	\$ 49,051	\$ 50,099	\$ 50,976	\$ 51,742	\$ 52,525
<b>Concessions</b>					
Terminal Concessions	\$ 42,320	\$ 38,628	\$ 39,534	\$ 40,274	\$ 41,031
Ground Transportation	10,359	10,454	10,558	10,558	10,558
Other Commissions	8,390	7,250	7,003	7,003	7,003
Rental Car	<u>33,221</u>	<u>31,737</u>	<u>33,032</u>	<u>33,534</u>	<u>34,044</u>
Subtotal: Concessions	\$ 94,289	\$ 88,069	\$ 90,127	\$ 91,369	\$ 92,636
Other (c)	\$ 32,283	\$ 29,693	\$ 30,429	\$ 30,644	\$ 30,846
<b>Subtotal: Logan Revenues</b>	\$ 626,099	\$ 661,368	\$ 678,688	\$ 705,972	\$ 720,324
<i>Percentage change</i>		5.6%	2.6%	4.0%	2.0%
<b>Hanscom and Worcester Revenues</b>	\$ 14,128	\$ 13,606	\$ 13,917	\$ 14,068	\$ 14,222
<b>Total Revenues</b>	\$ 640,227	\$ 674,974	\$ 692,606	\$ 720,040	\$ 734,546
<i>Percentage change</i>		5.4%	2.6%	4.0%	2.0%
<b>Operating Expenses</b>					
<b>Logan Expenses (d)</b>	\$ 333,177	\$ 355,842	\$ 373,108	\$ 391,651	\$ 410,078
<i>Percentage change</i>		6.8%	4.9%	5.0%	4.7%
<b>Hanscom and Worcester Expenses</b>	\$ 21,647	\$ 24,248	\$ 27,485	\$ 28,721	\$ 29,980
<b>Airport Properties Operating Expenses</b>	\$ 354,823	\$ 380,090	\$ 400,592	\$ 420,371	\$ 440,058
<i>Percentage change</i>		7.1%	5.4%	4.9%	4.7%
<b>AIRPORT PROPERTIES NET REVENUES</b>	\$ 285,403	\$ 294,884	\$ 292,013	\$ 299,669	\$ 294,488
<i>Percentage change</i>		3.3%	-1.0%	2.6%	-1.7%

(a) Excludes general aviation passengers.

(b) Includes charges for baggage screening facilities.

(c) Includes subtenant fees, conduit fees, operating grants and other items.

(d) Including expenses for other unrecoverable items, such as budget contingency.

Note: Amounts in the columns may not add to the subtotals and totals because of rounding.

Source: Massachusetts Port Authority.

**Exhibit B**  
**SENSITIVITY TEST**  
**PROJECTED AIRPORT PROPERTIES NET REVENUES**

Massachusetts Port Authority Airport Properties  
(for the 12 months ending June 30, passengers and \$ in thousands)

This scenario is based upon hypothetical assumptions as described in the text.

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
<b>Logan Airport Total Passengers (a)</b>	36,907	38,014	31,133	31,787	34,553
<i>Percentage change</i>		3.0%	-18.1%	2.1%	8.7%
<b>Revenues</b>					
Landing Fees	\$ 110,225	\$ 119,065	\$ 124,194	\$ 129,632	\$ 133,617
Automobile Parking Fees	\$ 165,786	\$ 176,065	\$ 146,914	\$ 156,387	\$ 168,807
Utility Fees	\$ 16,438	\$ 17,769	\$ 18,124	\$ 18,487	\$ 18,856
Terminal Rentals (b)	\$ 158,026	\$ 180,609	\$ 185,460	\$ 194,843	\$ 200,751
Non-Terminal Building & Ground Rents	\$ 49,051	\$ 50,099	\$ 50,976	\$ 51,742	\$ 52,525
Concessions					
Terminal Concessions	\$ 42,320	\$ 38,628	\$ 32,551	\$ 33,504	\$ 36,700
Ground Transportation	10,359	10,454	8,457	8,550	9,208
Other Commissions	8,390	7,250	5,545	5,606	6,038
Rental Car	33,221	31,737	26,562	27,265	29,815
Subtotal: Concessions	\$ 94,289	\$ 88,069	\$ 73,116	\$ 74,926	\$ 81,761
Other (c)	\$ 32,283	\$ 29,693	\$ 30,429	\$ 30,644	\$ 30,846
<b>Subtotal: Logan Revenues</b>	\$ 626,099	\$ 661,368	\$ 629,213	\$ 656,661	\$ 687,161
<i>Percentage change</i>		5.6%	-4.9%	4.4%	4.6%
<b>Hanscom and Worcester Revenues</b>	\$ 14,128	\$ 13,606	\$ 13,917	\$ 14,068	\$ 14,222
<b>Total Revenues</b>	\$ 640,227	\$ 674,974	\$ 643,130	\$ 670,729	\$ 701,384
<i>Percentage change</i>		5.4%	-4.7%	4.3%	4.6%
<b>Operating Expenses</b>					
<b>Logan Expenses (d)</b>	\$ 333,177	\$ 355,842	\$ 373,108	\$ 391,651	\$ 410,078
<i>Percentage change</i>		6.8%	4.9%	5.0%	4.7%
<b>Hanscom and Worcester Expenses</b>	\$ 21,647	\$ 24,248	\$ 27,485	\$ 28,721	\$ 29,980
<b>Airport Properties Operating Expenses</b>	\$ 354,823	\$ 380,090	\$ 400,592	\$ 420,371	\$ 440,058
<i>Percentage change</i>		7.1%	5.4%	4.9%	4.7%
<b>AIRPORT PROPERTIES NET REVENUES</b>	\$ 285,403	\$ 294,884	\$ 242,538	\$ 250,358	\$ 261,326
<i>Percentage change</i>		3.3%	-17.8%	3.2%	4.4%

(a) Excludes general aviation passengers.

(b) Includes charges for baggage screening facilities.

(c) Includes subtenant fees, conduit fees, operating grants and other items.

(d) Including expenses for other unrecoverable items, such as budget contingency.

Note: Amounts in the columns may not add to the subtotals and totals because of rounding. No changes in assumptions have been made regarding operating expenses, or the timing of the implementation of capital projects.

Source: Massachusetts Port Authority.

## APPENDIX E

### SUMMARY OF CERTAIN PROVISIONS OF THE 1978 TRUST AGREEMENT

The following summary does not purport to be complete and is subject to all of the terms and conditions of the 1978 Trust Agreement, to which reference is hereby made, the form of which is available for examination at the offices of the Authority and the Trustee. The summary makes use of terms defined in the 1978 Trust Agreement, certain of which are also defined below. The summary includes the effect of the expected issuance of the 2017 Bonds on July 19, 2017, the redemption of the 2007-C Bonds and the 2010-D Bonds on July 20, 2017 and the proposed amendments to the 1978 Trust Agreement set forth in the Twenty-First Supplemental Agreement that will not become effective until the date the holders of 51% in the aggregate principal amount of the Bonds outstanding on such date have approved and consented to the amendments to the 1978 Trust Agreement as set forth in such Twenty-First Supplemental Agreement. The proposed amendments to the 1978 Trust Agreement pursuant to the Twenty-First Supplemental Agreement are shown in italics and underlined and indicated by footnotes contained herein.

#### **Pledge Effected by the 1978 Trust Agreement (Sections 701, 601, 507 and 507A)**

Payment of the principal, interest and redemption premium on the Bonds is secured by a pledge of the Revenues, in the manner and to the extent set forth in the 1978 Trust Agreement. See "SECURITY FOR THE 2017 BONDS -- General." The Enabling Act provides that the Authority is authorized in the 1978 Trust Agreement to pledge its tolls and other revenues, over and above the amounts necessary to pay current expenses and to provide reserves therefor, to the payment of the interest on and principal of its Bonds. The Enabling Act further provides that such pledge is valid and binding when made, and that the revenues so pledged shall immediately be subject to the lien of such pledge without physical delivery thereof or further act, and such lien shall be valid and binding as against all parties having claims of any kind irrespective of whether such parties have notice thereof. The Bonds issued under the 1978 Trust Agreement are not a debt or obligation of the Commonwealth or of any political subdivision thereof but are payable solely from the Revenues pledged for their payment and certain Funds and Accounts created by the 1978 Trust Agreement.

The 1978 Trust Agreement provides that the moneys in all Funds and Accounts which are held by the Authority shall be subject to a lien and charge in favor of the Trustee and the holders of the Bonds to the same extent as provided with respect to moneys deposited with the Trustee. All moneys deposited with the Trustee as required by the 1978 Trust Agreement shall be held by the Trustee in trust and applied as provided in the 1978 Trust Agreement and, pending such application, shall be subject to a lien and charge in favor of the Trustee and the holders of the outstanding Bonds on the terms and conditions set forth therein until disbursed.

The 1978 Trust Agreement provides that amounts, if any, deposited in a separate account of the Operating Fund created under the 1978 Trust Agreement which represent payments in respect of pension obligations of the Authority will, upon the occurrence of an event of default under the 1978 Trust Agreement, first be applied to present and accrued pension benefits of the Authority's employees. The 1978 Trust Agreement further provides for the payment of the Authority's obligations in respect of post-retirement health benefits to a separate trustee or into a

separate account of the Operating Fund. Amounts, if any, deposited in such separate account will, upon the occurrence of an event of default under the 1978 Trust Agreement, first be applied to present and accrued post-retirement health benefits of the Authority's employees.

### **Establishment of Funds and Accounts (Sections 503, 209 and 401)**

The 1978 Trust Agreement creates a Revenue Fund, an Operating Fund (which includes a separate Self-Insurance Account, a separate pension account and a separate post-retirement health benefits account), an Interest and Sinking Fund (which includes three separate accounts, namely, a Bond Service Account, a Redemption Account and a Reserve Account *(which includes a Pooled Reserve Subaccount and one or more additional subaccounts established by resolution of the Authority)*<sup>1</sup>, and may also include one or more Term Bond Investment Accounts established by resolution of the Authority for a subsequent Series of Bonds), a Maintenance Reserve Fund, a Payment in Lieu of Taxes Fund, a Capital Budget Fund and an Improvement and Extension Fund (which includes separate Rebate Funds pertaining to each Series of Bonds, separate principal, interest and escrow accounts relating to a subordinated debt financing of the Authority, payment and rebate accounts relating to the tax-exempt commercial paper program of the Authority, and such other accounts as the Authority may from time to time establish). The 1978 Trust Agreement also provides for a Construction Fund and for separate Project Accounts within such Fund.

The Authority holds and administers in trust the Revenue Fund, the Operating Fund (except the Self-Insurance Account, the pension account and the post-retirement health benefits account) and the Improvement and Extension Fund. All of the other Funds and Accounts are held and administered by the Trustee.

### **Application of Revenues**

Under the 1978 Trust Agreement all Revenues are to be deposited, daily as far as practicable, into the Revenue Fund held by the Authority.

Operating Fund (Section 506) -- As often as practicable the Authority shall transfer from the Revenue Fund to the Operating Fund all Revenues on deposit therein. The Authority will pay when due all Operating Expenses from the Operating Fund.

On the seventh business day of each month the Authority is required to make transfers from the moneys on deposit in the Operating Fund as of the seventh business day of such month as follows:

to the trustee of the Authority's pension plan, one-twelfth (1/12) of the Authority's actuarially determined annual pension expense;

to a separate trustee or to a special separate post-retirement health benefit account, one-twelfth (1/12) of the Authority's actuarially determined annual post-retirement health expense; and

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<sup>1</sup> Language related to the Pooled Reserve Subaccount to be added upon effective date of the Twenty-First Supplemental Agreement.

to the Trustee for deposit in the Self-Insurance Account, amounts substantially as recommended by the Authority's Risk Management Consultant.

After (x) paying Operating Expenses, (y) making any required transfers to the trustee of the Authority's pension fund, to the trustee for the Authority's post-retirement health benefit account and to the Trustee for deposit in the Self-Insurance Account, and (z) retaining in the Operating Fund such amount as the Authority may deem necessary (provided that the balance retained therein does not exceed 15% of annual Operating Expenses established in the Annual Budget of the Authority), the Authority is required on the seventh business day of each month to transfer the balance in the Operating Fund to the Trustee for deposit in the following Funds and Accounts in the following order (no transfer to be made into any Fund or Account until there shall have been deposited in the next preceding Fund or Account the full amount required):

- (1) Interest and Sinking Fund (Sections 510 and 522) -- Amounts in this Fund will be applied to the payment of the Bonds and any additional Bonds which may be issued in the future. Such Bonds which may be issued in the future are hereinafter referred to as "Additional Bonds".

*Bond Service Account:* There shall be deposited in this Account the amount needed to make the sum therein, together with any amounts transferred from the Construction Fund or Available Funds deposited for the payment of a Series of Bonds pursuant to the 1978 Trust Agreement<sup>2</sup> equal to (a) interest accrued and to accrue until the first day of the next month on all outstanding 2007 Bonds, 2008 Bonds, 2010 Bonds, 2012 Bonds, 2014 Bonds, 2015 Bonds, 2016 Bonds, 2017 Bonds and any Additional Bonds, plus (b) principal accrued and to accrue until the first day of the next month on all serial 2007 Bonds, serial 2008 Bonds, serial 2010 Bonds, serial 2012 Bonds, serial 2014 Bonds, serial 2015 Bonds, serial 2016 Bonds, serial 2017 Bonds and any serial Additional Bonds which will become payable within the next year.

*Redemption Account:* There shall be deposited in this Account the amount needed to make the amount deposited therein equal to the Amortization Requirements, if any, for such fiscal year on all outstanding term 2007 Bonds, term 2008 Bonds, term 2010 Bonds, term 2012 Bonds, term 2014 Bonds, term 2015 Bonds, term 2016 Bonds, term 2017 Bonds and any term Additional Bonds accrued and to accrue until the first day of the next month, plus an amount equal to any premium which would be payable on any date commencing with July 2 in such fiscal year and ending with July 1 in the following fiscal year, both inclusive, accrued or to accrue until the first day of the next month less the amount of Available Funds deposited in the Redemption Account for the payment of a Series of Bonds pursuant to the 1978 Trust Agreement.<sup>3</sup> If the balance remaining after making the deposit to the Bond Service Account shall not be sufficient to make the deposits into the Redemption Account and the Term Bond Investment Account, described below, the amount to be deposited in each Account shall be pro-rated in accordance with the respective amounts required.

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<sup>2</sup> Offset of Available Funds to be added upon effective date of the Twenty-First Supplemental Agreement.

<sup>3</sup> Offset of Available Funds to be added upon effective date of the Twenty-First Supplemental Agreement.

*Term Bond Investment Account:* The 1978 Trust Agreement allows the Authority to provide for the payment of the principal of Additional Bonds issued as term Bonds through establishment of a Term Bond Investment Account. If a Term Bond Investment Account is established, monthly amounts would be deposited therein and invested in Government Obligations in accordance with the resolution authorizing such term Additional Bonds. No Term Bond Investment Account was established for any Series of outstanding Bonds, and none will be established for the 2017 Bonds.

*Reserve Account:*<sup>4</sup> Within the Reserve Account there is hereby created the "Pooled Reserve Subaccount" and one or more additional subaccounts hereafter established by resolution of the Authority. Upon issuance of any Bonds there shall be deposited in the Reserve Account an amount at least equal to one-half of the difference between (a) the increase in the maximum annual Principal and Interest Requirements on such Bonds and all then-outstanding Bonds, and (b) the amount, if any, in the Reserve Account in excess of the maximum annual Principal and Interest Requirements on all then-outstanding Bonds. Following the effective date of the Twenty-First Supplemental Agreement, the Authority shall deposit into the Pooled Reserve Subaccount from the proceeds of any Series of additional Bonds secured by such subaccount, or from such other moneys of the Authority as may be available and which the Authority elects to apply for such purpose, an amount at least equal to one-half the amount equal to (a) the increase in the maximum annual Principal and Interest Requirements on such Bonds and all then-outstanding Bonds secured by such subaccount, and (b) the amount, if any, in the Reserve Account in excess of the maximum annual Principal and Interest Requirements on all then-outstanding Bonds secured by such subaccount. In addition, there shall be deposited in this Account each month a sum equal to one-sixtieth of the difference between (a) the maximum annual Principal and Interest Requirements for any fiscal year thereafter on account of all Bonds then outstanding, less (b) the sum of (x) the amount so deposited into the Reserve Account upon the issuance of such Bonds, and (y) any amount in the Reserve Account in excess of the maximum annual Principal and Interest Requirements on all then-outstanding Bonds prior to the issuance of such Bonds. If the amounts held on deposit in the Reserve Account exceed the maximum Principal and Interest Requirements for any fiscal year on account of all Bonds then outstanding, the excess shall be transferred to the Improvement and Extension Fund.

Prior to the authentication and delivery of any Series of Bonds, the Authority shall adopt a resolution which shall specify or shall delegate, within specified parameters to an authorized officer of the Authority, the ability to determine the Reserve Requirement, if any, with respect to such Series of Bonds to be deposited in or credited to a subaccount in the Reserve Account with respect to such Series of Bonds designated by such resolution and any other terms with respect to the funding of such Reserve Requirement.

There may be created within the Reserve Account by the resolution of the Authority authorizing a Series of Bonds a separate subaccount for such Series of Bonds;

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<sup>4</sup> Amendments regarding the Reserve Fund and Reserve Requirement to be added upon effective date of the Twenty-First Supplemental Agreement.

provided that (i) the Authority may elect in such resolution that any then-existing subaccount within the Reserve Account (including without limitation the Pooled Reserve Subaccount) shall secure such additional Series of Bonds on a parity basis (if permitted by the resolution of the Authority which established such subaccount); and (ii) with respect to any Series of Bonds, the Authority may elect in the resolution that such Series of Bonds shall not be secured by any subaccount in the Reserve Account and, accordingly, not to establish any subaccount in the Reserve Account to secure such Series of Bonds. Any resolution of the Authority providing for the issuance of a Series of Bonds which establishes a separate subaccount within the Reserve Account shall specify (a) whether such subaccount shall secure only such Series of Bonds or may secure additional Series of Bonds and (b) the Reserve Requirement applicable to such subaccount.

The Authority shall not be required to fully fund a subaccount in the Reserve Account at the time of issuance of a Series of Bonds, if it elects, by the resolution of the Authority authorizing issuance of such Series of Bonds, to fully fund the applicable subaccount in the Reserve Account over a period specified in such resolution, not to exceed sixty (60) months, commencing with the next succeeding fiscal year of the Authority, during which it shall make substantially equal monthly installments in order that the amounts on deposit therein at the end of such period shall equal the Reserve Requirement for such Series of Bonds.

In lieu of making deposits to the Reserve Account as and at the times required by the 1978 Trust Agreement, the Authority, at its option, may satisfy all or any portion of such deposit requirement by providing to the Trustee (a) an irrevocable, unconditional letter of credit issued by a bank, savings and loan association or other provider of such letters of credit whose long-term obligations are rated in one of the two highest rating categories by Moody's Investors Service and Standard & Poor's, or (b) an insurance policy providing substantially equivalent liquidity as an irrevocable, unconditional letter of credit and issued by a municipal bond or other insurance company that is of sufficient credit quality to entitle debt backed by its insurance policy or surety bond to be rated in one of the two highest rating categories by Moody's Investors Service and Standard & Poor's.

(2) Maintenance Reserve Fund (Section 510) -- There shall be deposited each month in this Fund an amount equal to one-twelfth of 1% of the Replacement Cost of all Projects of the Authority as determined by the Consulting Engineer for the then current fiscal year, or such greater amount as may have been specified in the Annual Budget for such fiscal year; provided that the amount on deposit in the Maintenance Reserve Fund and not theretofore obligated shall not exceed 5% of the Replacement Cost of all Projects of the Authority.

(3) Payment in Lieu of Taxes Fund (Section 510) -- There shall be deposited in this Fund the amount required to make the balance in this Fund equal to the cumulative amount which should then be on deposit therein assuming the amounts payable in lieu of taxes on the next following payment dates were paid in equal monthly installments from the preceding payment dates under any agreements entered into pursuant to authorizing legislation.

(4) Capital Budget Fund (Section 510) -- There shall be deposited in this Fund amounts necessary to provide for the Capital Budget in each fiscal year as determined by the Authority,

subject to increase or reduction by resolution of the Authority. Amounts may be withdrawn from the Capital Budget Fund for expenditure in accordance with the Capital Budget or as otherwise determined by the Authority.

(5) Improvement and Extension Fund (Section 510) -- Any balance of moneys in the Operating Fund after making required transfers to the Trustee for the above Funds and Accounts will be transferred to the Improvement and Extension Fund. Amounts may be withdrawn from the Improvement and Extension Fund for any lawful purpose of the Authority.

### **Application of Funds and Accounts**

Operating Fund (Section 506) -- Operating Expenses, as determined in the Authority's Annual Budget, are paid from this Fund. Amounts deposited in the Self-Insurance Account in the Operating Fund are to be used to pay uninsured or self-insured losses.

Interest and Sinking Fund (Sections 511, 512, 514 and 519) -- Moneys in the Bond Service Account shall be applied to the payment of interest on the Bonds and any Additional Bonds and the principal amount of any Bonds and any Additional Bonds as the same become due.

Moneys in the Redemption Account shall be applied to the purchase (at not more than the current redemption price unless another price is set by the Authority) or redemption of the Bonds and any Additional Bonds. Unless previously applied to purchase Bonds and any Additional Bonds, the Trustee shall apply moneys in such Account to meeting Amortization Requirements of the Bonds or any Additional Bonds on each July 1 when due. Moneys deposited in the Redemption Account shall be applied, first, to the purchase or redemption of term Bonds and any term Additional Bonds of each Series outstanding to the extent of their respective Amortization Requirements for the then current fiscal year plus the applicable premium, if any, and thereafter, at the option of the Authority, to the purchase or redemption of Bonds and any Additional Bonds.

Moneys in the Term Bond Investment Account, if such an account shall be created, shall be applied in the retirement of any applicable Series of term Additional Bonds required to be redeemed by either redemption or, at the direction of the Authority, by purchase at a price not exceeding the next applicable redemption price, or to the purchase of Government Obligations to be applied on the maturity date to payment of such Additional Bonds.

Moneys in each subaccount within<sup>5</sup> the Reserve Account shall be used by the Trustee to pay interest, principal of any serial Bonds, and Amortization Requirements with respect to term Bonds, or to make deposits to a Term Bond Investment Account, whenever and to the extent that the Bond Service Account and the Redemption Account or the Term Bond Investment Account are insufficient for such purposes.

If at any time after so applying the applicable subaccount within<sup>6</sup> the Reserve Account, moneys held in the Bond Service Account or the Redemption Account of the Interest and Sinking Fund shall be insufficient for the payment of the principal or premium of, or interest or

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<sup>5</sup> Language related to subaccounts to be added upon effective date of the Twenty-First Supplemental Agreement.

<sup>6</sup> Language related to subaccounts to be added upon effective date of the Twenty-First Supplemental Agreement.



Amortization Requirements on the Bonds and any Additional Bonds as the same become due, such insufficiency shall be made up by transfers from the Improvement and Extension Fund, the Capital Budget Fund, the Payment in Lieu of Taxes Fund and the Maintenance Reserve Fund, in that order.

Maintenance Reserve Fund (Section 516) -- Moneys in this Fund are to be applied to pay for (i) renewals, reconstruction and replacement of any facilities of the Authority, (ii) acquiring and installing or replacing equipment, (iii) unusual or extraordinary maintenance or repairs, (iv) repairs or replacements for which the proceeds of insurance are inadequate, and (v) transfers to the Bond Service Account and Redemption Account when these Accounts are insufficient to pay the principal or premium, or interest or Amortization Requirements on the Bonds and any Additional Bonds, or for making required deposits to any Term Bond Investment Account, as they become due.

Payment in Lieu of Taxes Fund (Section 517) -- Moneys in this Fund will be used to make payments in lieu of taxes pursuant to agreements entered into by the Authority pursuant to statute or, as provided in the 1978 Trust Agreement, payment of a shortfall in debt service on the Bonds.

Capital Budget Fund (Section 517A) -- Moneys in this Fund are to be disbursed in accordance with any Capital Budget adopted by the Authority. Amounts in this Fund may be withdrawn to the extent not previously obligated. The Authority may transfer amounts from the Improvement and Extension Fund to this Fund as it sees fit.

Improvement and Extension Fund (Section 518) -- Moneys in this Fund may be used by the Authority for any lawful purpose, including, without limitation, transfer to any other Fund or Account. The resolutions of the Authority pertaining to each outstanding Series of Bonds created within the Improvement and Extension Fund as segregated accounts separate Rebate Funds for such Bonds, each to be held for the sole benefit of the United States of America. Excess Earnings (as defined in such resolutions) will be deposited in Rebate Funds and used exclusively to make rebate payments to the United States of America. To the extent of any deficiency in any Rebate Fund, such payments will be made out of the Operating Fund and other available moneys of the Authority.

If then permitted by law, moneys held for the credit of the Improvement and Extension Fund may be pledged to the payment of principal of and interest on notes or other obligations issued for any purpose for which moneys in such Fund may be disbursed. The Improvement and Extension Fund or portions thereof have been and may be pledged to secure certain obligations of the Authority. See “APPENDIX A– Other Obligations—Subordinated Revenue Bonds” and “– Commercial Paper.”

### **Covenants as to Fees and Charges (Section 501)**

In the 1978 Trust Agreement the Authority covenants:

To charge such tolls, rates, fees, rentals and other charges as from time to time may be necessary so that the Revenues in each fiscal year will at least equal in such fiscal year the greater of (a) an amount sufficient to provide funds for Operating Expenses for such fiscal year

plus an amount equal to 125% of Principal and Interest Requirements on all outstanding Bonds during such fiscal year (excluding capitalized interest payable from the Construction Fund), or (b) an amount sufficient to provide funds for Operating Expenses for such fiscal year, to pay principal of, interest on and redemption price, if any, on all outstanding Bonds as required by the 1978 Trust Agreement (less capitalized interest paid from the Construction Fund *and Available Funds deposited as provided in the 1978 Trust Agreement*)<sup>7</sup>, to make required deposits to the Maintenance Reserve Fund, the Payment in Lieu of Taxes Fund and the Capital Budget Fund, and to provide amounts required to be deposited to the Improvement and Extension Fund pursuant to any supplement to the 1978 Trust Agreement which may be entered into by the Trustee and the Authority providing for the issuance of separately secured obligations.

If in any year the Revenues shall be less than the amounts required by the preceding paragraphs, the Authority will cause recognized experts, other than the Consulting Engineers, in the field of estimating revenues of a facility or element of a facility to which the recommendations relate, to recommend revised schedules of tolls, rates, fees, rentals and other charges; and if the Authority shall comply with all such recommendations, the failure of Revenues to equal the amounts specified in the preceding paragraph will not of itself constitute an event of default under the 1978 Trust Agreement.

Before placing in operation any Additional Facilities financed by a Series of Bonds, to place in effect with respect thereto tolls, rates, fees, rentals and other charges in substantial conformity with those anticipated by the recognized experts in estimating the Revenues of such Additional Facilities in connection with the issuance of such Series of Bonds.

Before placing in operation any Additional Improvements financed by a Series of Bonds for the use of which a charge would ordinarily be made, to place in effect with respect thereto tolls, rates, fees, rentals and other charges in substantial conformity with those anticipated by the recognized experts in estimating the Revenues of the Project to which such Additional Improvements relate in connection with the issuance of such Series of Bonds.

To place in effect on the date or dates specified any increase in rates and charges that have been adopted by the Authority and taken into account by the recognized experts who estimated Revenues in connection with the issuance of an additional Series of Bonds, provided that such increase need not be imposed in the event that the Secretary-Treasurer certifies in writing, confirmed by certificates of such recognized experts, that such additional Series of Bonds could then be issued under the provision of the 1978 Trust Agreement that permitted the issuance of such additional Series of Bonds.

### **Issuance of Additional Bonds (Sections 209 and 210)**

The 1978 Trust Agreement permits the issuance of Additional Bonds for the purpose of financing costs incident to any Additional Improvements or Additional Facilities and of refunding outstanding Bonds and subordinated obligations of the Authority. Such Additional Bonds may be issued only if, at the time of such issuance, there is no existing default under the 1978 Trust Agreement and certain projected or historical earnings tests are met. Such tests are to

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<sup>7</sup> Offset of Available Funds to be added upon effective date of the Twenty-First Supplemental Agreement.

be based on information with respect to the Additional Improvements or Additional Facilities provided by recognized experts (as to estimated future Revenues), by the Consulting Engineers *or a Consultant*<sup>8</sup> (as to cost and estimates of funds available to pay such cost, completion date, date on which such Additional Facilities or Additional Improvements will be placed in operation, and estimated future Operating Expenses), and by the Authority (as to historical financial information, estimated investment earnings and the Principal and Interest Requirements on the Additional Bonds). Certificates must be filed with the Trustee showing compliance with the following requirements:

A. If the Additional Bonds are issued to finance all or the first portion of the estimated cost of Additional Improvements, (i) Net Revenues in any twelve consecutive months of the last 18 months were at least 125% of the Principal and Interest Requirements on all Bonds outstanding during such twelve months, and (ii) the estimated average annual Net Revenues for the three fiscal years commencing immediately following the latest estimated date of placing in operation any Additional Improvements or Additional Facilities for which any Series of Bonds has been or is then being issued will be at least 130% of the estimated maximum Principal and Interest Requirements in any year thereafter on account of all Bonds to be outstanding, including the estimated amount of Bonds to be issued in the future to complete such Additional Improvements or Additional Facilities.

B. If the Bonds issued under Paragraph A were issued to finance only the first portion of the estimated cost of Additional Improvements, subsequent Bonds may be issued to finance the cost of such Additional Improvements upon compliance with a test comparable to that set forth in clause (ii) of Paragraph A modified by changing the percentage contained therein to 125%.

C. If the Bonds are issued to finance all or the first portion of the estimated cost of Additional Facilities, the applicable test is comparable to that set forth in Paragraph A modified by changing the percentage in clause (ii) of Paragraph A to 140%.

D. If the Bonds issued under Paragraph C are issued to finance only the first portion of the estimated cost of Additional Facilities, subsequent Bonds may be issued to finance the cost of such Additional Facilities upon compliance with a test comparable to that set forth in clause (ii) of Paragraph A modified by changing the percentage contained therein to 135%.

E. Notwithstanding Paragraphs A, B, C and D, if the Additional Bonds are being issued to finance all or any portion of the estimated cost of Additional Improvements or Additional Facilities, they may be issued if Net Revenues in any twelve consecutive months of the last 18 months were at least 125% of the maximum annual Principal and Interest Requirements on all outstanding Bonds, the Bonds then being issued and any subsequent Additional Bonds estimated to be issued to complete Additional Improvements or Additional Facilities for which a Series of Additional Bonds has been issued under Paragraph A or C. In addition to the statement by the Consulting

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<sup>8</sup> Option for “a Consultant” to be added upon effective date of the Twenty-First Supplemental Agreement.

Engineers *or a Consultant* described above, the Authority is required to file the certificate of the Consulting Engineers *or a Consultant* described below under “Restrictions on Certain Additional Facilities”.<sup>9</sup>

F. If Bonds are issued under Paragraph A or C to finance all of the then estimated cost of Additional Improvements or Additional Facilities, an additional Series of Bonds to complete such Additional Improvements or Additional Facilities may be issued without compliance with any of the tests in the paragraphs above.

With respect to any Additional Bonds which bear interest at a variable rate or a rate which is otherwise not subject to definite determination over the period of any calculation required by the 1978 Trust Agreement, all provisions of the 1978 Trust Agreement which require use of a definite interest rate for purposes of any calculation shall be applied as if the interest rate for such Additional Bonds were the rate estimated by a nationally known investment banking firm, selected by the Authority (which firm may be an owner or underwriter of any Bonds), to be the rate at which such Additional Bonds would bear interest if they were issued at par and bore a fixed rate for the entirety of their term. The provisions of the 1978 Trust Agreement requiring any calculation shall be applied to Additional Bonds which accrue and compound interest for all or any portion of the term thereof as if interest accrued during such period in the manner provided in such Additional Bonds. Any Additional Bonds may accrue interest at such rate or rates as are determined in accordance with the resolution of the Authority providing for their issuance and such interest may be payable on such date or dates, which may be other than January 1 and July 1, as are set forth in such resolution.

### **Issuance of Refunding Bonds (Sections 209 and 212)**

Under the 1978 Trust Agreement the Authority may issue Additional Bonds for the purpose of refunding all or any part of the outstanding Bonds of any one or more issues or series then outstanding and paying issuance costs.

Such refunding Bonds may be issued only if one of the following conditions is met: (i) the Principal and Interest Requirements on account of all Bonds for each fiscal year until the year following the fiscal year in which any non-refunded Bonds mature are not increased by reason of the refunding, (ii) the Net Revenues of the Authority during any twelve consecutive months out of the most recent 18-month period were not less than 125% of the maximum Principal and Interest Requirements for any fiscal year thereafter (giving effect to the refunding and any Bonds to be issued for the completion of Additional Improvements and Additional Facilities); or (iii) (a) the Net Revenues during any twelve consecutive months out of the most recent 18-month period were at least 125% of the Principal and Interest Requirements on all outstanding Bonds during such twelve months, and (b) the estimated average annual Net Revenues for the three fiscal years commencing immediately following the latest estimated date of placing in operation any Additional Improvements or Additional Facilities for which any series of Bonds has been issued will be at least 135% of the estimated maximum Principal and Interest Requirements for any year (giving effect to the refunding and any Bonds to be issued for the completion of Additional Improvements and Additional Facilities).

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<sup>9</sup> Option for “a Consultant” to be added upon effective date of the Twenty-First Supplemental Agreement.

## **Issuance of Other Obligations (Section 216)**

The 1978 Trust Agreement permits the Authority to issue obligations for any lawful purpose which are not secured by any pledge on, nor payable from, the Revenues or any of the Funds and Accounts created by the 1978 Trust Agreement.

The 1978 Trust Agreement permits the Authority, if permitted by law, to issue notes or other obligations for any purposes (as described above) for which Additional Bonds may be issued and to pledge moneys held for the credit of the Improvement and Extension Fund to the payment of principal and interest of such notes or other obligations which have been issued for any purpose for which the moneys held for the credit of such Fund may be disbursed. The Authority may also issue notes payable solely from the proceeds of the issuance of Additional Bonds or other permitted borrowing. The 1978 Trust Agreement also provides that the Authority may issue obligations the principal of and redemption premium, if any, and interest on which is payable from and secured by a pledge of and lien on the Revenues junior and subordinate to those created by the 1978 Trust Agreement for the benefit of the Bondholders, provided that such obligations shall be payable solely from moneys in the Improvement and Extension Fund, from additional issues of such subordinate obligations, or, if such obligations were issued for purposes for which Additional Bonds could have been issued, from the proceeds of Additional Bonds thereafter issued.

## **Construction Fund (Article IV)**

Under the 1978 Trust Agreement, the proceeds of all Additional Bonds or Notes issued to provide funds to pay the cost of Additional Improvements or Additional Facilities are to be deposited in separate Project Accounts within the Construction Fund. The Construction Fund is held by the Trustee. There may also be deposited in the appropriate Project Accounts other moneys received from any other source for the construction of Additional Improvements or Additional Facilities. Except for payments to cover interest on any Additional Bonds through the second interest payment date after completion of construction of the last of the Additional Improvements or Additional Facilities financed therewith (to the extent such interest payments are called for by the resolution of the Authority authorizing the issuance of such Additional Bonds), payments may be made only upon filing with the Trustee a requisition properly executed on behalf of the Authority and accompanied by an approving certificate of the Consulting Engineers *or a Consultant* and a certificate of the Authority to the effect that the obligations which are the subject of the requisition are due and payable. Any balance remaining in the appropriate Project Account in the Construction Fund upon completion of the Additional Improvements or Additional Facilities funded with a particular Series of Bonds not reserved by the Authority with the approval of the Consulting Engineers *or a Consultant* for the payment of any remaining cost thereof shall be transferred to the Improvement and Extension Fund.<sup>10</sup>

## **Completion of Projects (Section 702)**

The Authority covenants that forthwith after the issuance of any Series of Additional Bonds to finance Additional Improvements or Additional Facilities it will proceed with the

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<sup>10</sup> Option for “a Consultant” to be added upon effective date of the Twenty-First Supplemental Agreement.

construction or acquisition of such Additional Improvements or Additional Facilities. Such construction will be in accordance with plans approved by the Consulting Engineers *or a Consultant*.<sup>11</sup> If the Authority determines not to construct or acquire, or to reduce the scope of, any such Additional Improvements or Additional Facilities, it may construct other improvements or facilities or broaden the scope of such improvements or facilities if the recognized experts certify that there will be no overall cost increase and that the changes will not impair the operating efficiency of the Project or materially adversely affect estimated Net Revenues. However, in the case of the improvements or facilities financed with Bonds issued pursuant to Paragraph E under “Issuance of Additional Bonds” above, construction or acquisition may be suspended or abandoned without compliance with the preceding sentence and any unexpended Bond proceeds will be transferred to another Project Account in the Construction Fund or to the Redemption Account. In any event, if the Authority determines that changes in financial, economic or other conditions since the issuance of any Additional Bonds make it imprudent to continue construction or acquisition of the Additional Improvements or Additional Facilities financed therewith, then construction or acquisition may be suspended or abandoned and any unexpended Bond proceeds may be transferred to another Project Account in the Construction Fund or the Redemption Account, as the Authority may determine.

#### **No Liens (Section 704)**

The Authority covenants not to create or suffer to be created any lien upon any Project or any of the Revenues except the lien created by the 1978 Trust Agreement and the liens described under “Issuance of Other Obligations” above. The Authority is required to pay or cause to be discharged all claims and demands which if unpaid might become such a lien, but is not required to provide for the payment and discharge of liens which are being contested in good faith and by appropriate legal proceedings.

#### **Accountants, Consultants and Engineers (Section 706)**

The 1978 Trust Agreement provides that the Authority (i) will, for the purpose of performing and carrying out the duties imposed on the Accountants by the 1978 Trust Agreement, employ a firm of independent certified public accountants of recognized ability and standing nationwide, (ii) will, for the purpose of performing and carrying out the duties imposed upon the Consulting Engineers, the Airport Consultants and the Traffic Engineers by the 1978 Trust Agreement, employ independent engineers or engineering firms having a nationwide and favorable repute for skill and experience in such work, and (iii) for the purpose of determining its annual pension expense and its annual post-retirement health benefit expense, may employ as Pension Consultants an independent actuarial consulting organization having a nationwide and favorable repute for skill and experience in such work. Other experts must be independent experts or firms of recognized ability and standing in their fields. The Consulting Engineers must prepare an annual report regarding maintenance of each Project and recommendations, including estimated costs, for maintenance and repair. Such reports are furnished to the Trustee and each Bondholder of Record. The Pension Consultants must submit annual reports setting forth the amount required to be transferred to the trustee for the Authority’s pension plan in the next succeeding fiscal year.

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<sup>11</sup> Option for “a Consultant” to be added upon effective date of the Twenty-First Supplemental Agreement.

## **Insurance (Sections 706 and 707)**

The Authority covenants in the 1978 Trust Agreement that it will employ a Risk Management Consultant of recognized ability and standing nationwide to make recommendations with respect to insurance against direct physical damage and hazards, including the amounts thereof, with deductibles and exclusions and a program of self-insurance. The Risk Management Consultant will submit an annual report setting forth the insurance recommended to be carried or the program of self-insurance recommended to be undertaken. The Authority covenants that it will substantially comply with the recommendations of the Risk Management Consultant or with additional recommendations with respect to a reduced program of self-insurance if the Authority requests the Risk Management Consultant to make such additional recommendations. The Authority also covenants to carry insurance against loss of revenues due to physical loss or damage to its facilities and excess liability insurance substantially as recommended by the Risk Management Consultant. The 1978 Trust Agreement also provides that the Authority will provide such workers' compensation benefits or such employer's liability protection as may be required by law but may provide the same through self-insurance.

## **No Impairment of Tax Exemption (Section 709)**

The Authority covenants that it will not take any action adversely affecting the federal income tax exemption of interest on the Bonds (except Bonds issued as taxable Bonds the interest on which is subject to federal income taxation) and will seek to preserve the exemption of interest on the Bonds from state income taxation. The Authority also will take or require to be taken such acts as may be reasonably within its ability and as may be required under applicable law to preserve the exemption from federal income taxation of interest on the Bonds (except any Bonds issued as taxable Bonds the interest on which is subject to federal income taxation).

## **Restrictions on Certain Additional Facilities (Section 710)**

The Authority covenants that it will not construct, acquire, or operate any building, structure or other facility, other than facilities financed by Additional Bonds issued under Paragraphs A through D under "Issuance of Additional Bonds" above, unless the Consulting Engineers *or a Consultant* file a statement to the effect that in their opinion the operation of such facility will not materially adversely affect the Net Revenues or impair the operating efficiency of the Projects taken as a whole.<sup>12</sup>

## **Restrictions on Disposition of Property (Section 714)**

The Authority covenants that it will not dispose of or encumber any Project or part thereof except that it may sell machinery, fixtures and other movable property if they are no longer needed or useful and the proceeds are applied to replacement or are deposited in the appropriate Project Account in the Construction Fund or in the Maintenance Reserve Fund, the Improvement and Extension Fund or the Redemption Account, as the Authority may determine. Subject to the provisions of the Authority's Enabling Act, real estate which the Authority, with the approval of the Consulting Engineers *or a Consultant*, determines is no longer needed or

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<sup>12</sup> Option for "Consultants" to be added upon effective date of the Twenty-First Supplemental Agreement.

useful may be sold or may be exchanged for real estate if the Authority and Consulting Engineers *or a Consultant* declare such exchange advantageous. No approval of the Consulting Engineers *or a Consultant* is required for the sale or exchange of real estate where the aggregate value of the real estate and contiguous parcels sold or exchanged within two years is no more than \$500,000.<sup>13</sup>

Notwithstanding the preceding paragraph, the Authority may, if permitted by law, sell or exchange all or any part of a Project other than any property necessary for the efficient operation of the Airport, provided that certificates are filed with the Trustee showing compliance with the following requirements:

- (A) no event of default is then existing under the 1978 Trust Agreement;
- (B) the amount on deposit in *each subaccount within* the Reserve Account is at least equal to the *Reserve Requirement for* all Bonds then outstanding;<sup>14</sup> and
- (C) pro forma estimates confirmed by recognized experts show that the average annual Net Revenues for the two preceding fiscal years after giving effect to such sale or exchange would be at least 140% of the maximum annual Principal and Interest Requirements in any fiscal year thereafter on all Bonds then outstanding.

The proceeds of any such sale are not Revenues. See “Certain Definitions” below. Such proceeds may be deposited in the Improvement and Extension Fund or the Redemption Account as the Authority may direct. The Authority may also lease and grant licenses to use all or parts of its Projects. The Enabling Act requires the approval of the Governor of the Commonwealth for the sale of any Airport Properties or Port Properties originally acquired from the Commonwealth and provides that any proceeds of such sale be paid to the Commonwealth.

### **Annual Budget (Section 505)**

Under the 1978 Trust Agreement, the Authority agrees to adopt an Annual Budget prior to each fiscal year, setting forth expected Operating Expenses and Revenues of the Authority and deposits in the various Funds and Accounts described above, and to furnish copies thereof to the Trustee, Consulting Engineer and each Bondholder of Record. The Authority may at any time adopt an amended Annual Budget for the remainder of the then current fiscal year which shall be treated as the Annual Budget. The Authority agrees that except for amounts payable from the Maintenance Reserve Fund it will not expend any amount or incur any obligations for maintenance, repair and operation in excess of the amounts provided for Operating Expenses in the Annual Budget, unless the excess is derived from a source other than Revenues. The Authority is also required to adopt a capital budget annually.

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<sup>13</sup> Option for “a Consultant” to be added upon effective date of the Twenty-First Supplemental Agreement.

<sup>14</sup> Language related to subaccounts and the Reserve Requirement to be added upon effective date of the Twenty-First Supplemental Agreement.



## **Investments in Funds and Accounts (Section 602)**

Moneys held in the various Funds and Accounts, not currently needed for the purposes of such Funds and Accounts, will be invested by the Authority, or the Trustee upon direction of the Authority, in Investment Securities, except that moneys held in a Term Bond Investment Account may be invested only in Government Obligations. See “Certain Definitions -- Investment Securities” and “-- Government Obligations” below. Securities purchased as an investment of moneys in any Fund or Account created under the 1978 Trust Agreement shall be valued at their amortized cost. The income received from such investment shall, in the case of the Construction Fund and the Self-Insurance Account, be applied as provided in the resolution creating such Account.

## **Events of Default and Remedies of Bondholders (Article VIII)**

The 1978 Trust Agreement defines events of default to include, among others, failure to pay principal or redemption price when due or any installment of interest within 30 days after due, failure to make a required deposit in a Term Bond Investment Account relating to Additional Bonds as will permit the purchase of Government Obligations in accordance with the resolution authorizing such Additional Bonds, failure to carry on with reasonable dispatch the construction of any Additional Improvements or Additional Facilities (except as described above under “Completion of Projects”), a determination of receivership or insolvency, and failure to perform the covenants contained in the 1978 Trust Agreement after notice. Certain grace periods, not exceeding 60 days in any case, are permitted for remedying certain defaults.

Upon the occurrence and continuance of an event of default the Trustee may, on its own initiative, and shall, upon the request of the holders of not less than 25% in principal amount of the Bonds then outstanding, declare the entire principal amount of all outstanding Bonds to be immediately due and payable. The Trustee may, and upon the request of not less than 25% in principal amount of all Bonds not then due by their terms shall, annul such declaration at any time before final judgment or decree in any suit instituted on account of the default or before completion of any other remedy, if all amounts then due on all outstanding Bonds by their terms and all other charges and liabilities of the Trustee and amounts payable by the Authority under the 1978 Trust Agreement have been paid or deposited with the Trustee and every other known default shall have been remedied.

Upon the happening and continuance of an event of default the Trustee may, on its own initiative, and shall, upon the request of the holders of not less than 25% in principal amount of the Bonds then outstanding and upon being indemnified to its satisfaction, proceed either at law or in equity to protect and enforce its rights and the rights of bondholders under the Enabling Act or the 1978 Trust Agreement. No holder of any Bonds shall have any right to institute any suit, action or other proceeding for the enforcement of any right under the 1978 Trust Agreement unless such holder shall give to the Trustee written notice of the event of default on account of which such suit, action or proceeding is to be instituted, and unless the holders of 25% in principal amount of the Bonds then outstanding shall have made written request of the Trustee and shall have afforded the Trustee a reasonable opportunity to institute such suit, action or proceeding and unless there shall have been offered to the Trustee reasonable security and indemnity against the costs, expenses and liabilities to be incurred, and the Trustee shall have

refused or failed to comply with such request within a reasonable time. However, these provisions shall not limit or impair the right of any bondholder to take any action to enforce the payment of the principal of, premium, if any, and interest on its Bond.

The Trustee shall mail to all registered owners of Bonds then outstanding at their addresses as they appear on the registration books, and all other Bondholders of Record, written notice of the occurrence of any event of default set forth above within 30 days after the Trustee shall have notice pursuant to the 1978 Trust Agreement that any such event of default has occurred.

### **Concerning the Trustee (Article IX)**

Under the 1978 Trust Agreement, the Trustee is not obliged to institute any suit or proceeding or to defend any suit until indemnified against liabilities and expenses. Under the 1978 Trust Agreement, the Trustee is indemnified by the Authority from Revenues for any liabilities incurred in acting under the 1978 Trust Agreement. The Trustee is entitled to reasonable compensation for acting under the 1978 Trust Agreement and to reimbursement for any litigation expenses and other reasonable expenses by the Authority. If the Authority fails to make payment pursuant to such provisions for indemnity by the Authority or payment of compensation or expenses, the Trustee may obtain such payment from moneys held under the 1978 Trust Agreement and is entitled to a preference therefor over any of the Bonds. The 1978 Trust Agreement provides that the Trustee and its directors, officers, employees or agents, either for its or their own accounts or fiduciary accounts, may buy and sell and hold Bonds.

The Trustee may at any time resign upon at least 60 days' written notice *to be given to the Authority and filed with EMMA*.<sup>15</sup> The Trustee may be removed at any time (a) by the holders of not less than a majority in principal amount of the outstanding Bonds, or (b) for breach of trust or failure to act in accordance with the 1978 Trust Agreement by a court upon application of the Authority or the holders of not less than 25% in principal amount of the outstanding Bonds. Any removal of the Trustee shall take effect upon the appointment of a new Trustee. If the position of Trustee shall become vacant for any reason, the Authority shall appoint a successor trustee, subject to the right of the holders of a majority in aggregate principal amount of the Bonds then outstanding to appoint a successor Trustee which shall supersede the appointee of the Authority. Any trustee must be a bank or trust company with at least \$50,000,000 in aggregate capital and surplus.

The 1978 Trust Agreement also authorizes the Authority to replace the Trustee acting under the 1978 Trust Agreement, but only at five-year intervals and so long as no Event of Default exists under the 1978 Trust Agreement, upon 120 days written notice to the Trustee by filing with the Trustee an instrument signed on behalf of the Authority by its Secretary-Treasurer or other authorized officer.

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<sup>15</sup> Notice by EMMA instead of publication to be added upon effective date of the Twenty-First Supplemental Agreement.

## **Certain Rights of Bond Insurers (Section 1002)**

With respect to any Series of Bonds or any maturity within a Series of Bonds all of the principal of and interest on which is insured by a bond insurance policy, if so provided in the resolution of the Authority authorizing the issuance of such Series, the terms “holder” and “owner” of Bonds and the term “bondholder”, each as used in the 1978 Trust Agreement, for purposes of all consents, directions and notices provided for in the 1978 Trust Agreement shall mean, with respect to the Bonds of such Series or maturity, as the case may be, the issuer of such bond insurance policy as long as such policy issuer has not defaulted under such policy; provided, however, that unless it actually is the beneficial owner of the Bonds in respect of which a consent is requested, the policy issuer shall not have the power to act on behalf of the registered owners of any Bonds to consent to amendments, supplements or waivers that would (a) extend the stated maturity of or time for paying the interest on such Bonds, (b) reduce the principal amount of, purchase price for or redemption premium or rate of interest payable on such Bonds or (c) result in a privilege or priority of any Bond over any other Bond.

## **Modifications of the 1978 Trust Agreement (Article XI)**

Under the terms of the 1978 Trust Agreement, the Authority and the Trustee, without consent of the holders of the Bonds, are authorized to enter into a supplemental agreement or agreements to cure any ambiguity or formal defect or omission or to correct any inconsistent provisions or obvious mistake in the 1978 Trust Agreement, to grant to the Trustee for the benefit of the holders of the Bonds any additional lawful rights to security, to add to the conditions, limitations and restrictions on the issuance of Bonds, to add to the covenants of the Authority, to provide for the issuance of subordinated obligations or to provide for the issuance of obligations under a supplemental agreement which are not payable from Revenues. In addition, the 1978 Trust Agreement may be modified, altered, amended, added to or rescinded with the consent of the holders of not less than 51% in aggregate principal amount of the Bonds then outstanding or, if less than all Series of Bonds then outstanding are affected, the consent of the holders of not less than 51% in aggregate principal amount of each affected Series of Bonds. Notwithstanding the foregoing, without the consent of the holders of not less than 100% in aggregate principal amount of the Bonds then outstanding or, in case less than all of the several Series of Bonds then outstanding are affected thereby, the holders of not less than 100% in aggregate principal amount outstanding of each Series so affected, no such modification or amendment shall permit (a) an extension of the maturity of the principal of or the interest on any Bond issued thereunder, or (b) a reduction in the principal amount or redemption premium of any Bond or the rate of interest thereon, or (c) the creation of a lien upon or pledge of Revenues ranking prior to or on a party with the lien or pledge created by the 1978 Trust Agreement, or (d) a preference or priority of any Bond or Bonds except as permitted by the 1978 Trust Agreement, or (e) a reduction in the aggregate principal amount of the Bonds required for consent to such modification or amendment.

## **Defeasance (Article XII)**

If the Authority shall pay or cause to be paid the principal, premium, if applicable, and interest to the holders of all outstanding Bonds, then the pledge of any Revenues and other

moneys pledged under the 1978 Trust Agreement and all covenants, agreements and other obligations to the holders of Bonds shall terminate and be discharged and satisfied.

Bonds for the payment or redemption of which sufficient moneys, or sufficient Government Obligations the principal of and interest on which when due will provide moneys, to pay when due the principal, Amortization Requirements and interest on such Bonds have been irrevocably deposited with the Trustee for the sole purpose of paying or redeeming such Bonds will be deemed to have been paid within the meaning of the foregoing paragraph, provided that if any of such Bonds are to be redeemed prior to maturity, notice of such redemption must be duly given or irrevocable instructions to publish a notice to the bondholders, the form and content and substance of which are specified in the 1978 Trust Agreement, must have been given in form satisfactory to the Trustee.

### **Capital Appreciation Bonds (Section 1311)**

Bonds of any Series may be issued with interest payable (i) only at their stated maturity date (or upon earlier redemption, purchase or acceleration) or (ii) in part at their stated maturity date (or upon earlier redemption, purchase or acceleration) and in part on stated interest payment dates, as set forth in the resolution authorizing the issuance of the Bonds.

### **Certain Definitions**

Certain terms used in this Official Statement have the following meanings:

Additional Facilities -- Any revenue-producing facility which serves a public purpose and the acquisition or construction and the financing of which by the Authority may hereafter be authorized by the legislature of the Commonwealth, excluding, however, any extension, enlargement or improvement of a project then under the control of the Authority and any building, structure or other facility financed or refinanced by the Authority by obligations not issued under the provisions of the 1978 Trust Agreement.

Additional Improvements -- Any extension, enlargement or improvement of a Project, other than the extension, enlargement or improvement of any building, structure or other facility financed or refinanced by the Authority by obligations not issued under the provisions of the 1978 Trust Agreement.

Amortization Requirements -- The amounts for the respective fiscal years as determined by the Authority for the retirement of term Bonds of a Series.

Available Funds<sup>16</sup> -- For any period of time, (i) the amount of PFC Revenues and/or CFCs to be received by the Authority during such period and not previously pledged or irrevocably committed to payment of principal of, interest on or premium, if any, on a Series of Bonds, and (ii) the amount of any other future income or revenue source not then included in the definition of "Revenues" that the Authority designates as "Available Funds" in a future resolution duly adopted by the Members of the Authority supplementing the 1978 Trust Agreement; provided, however, that any such resolution shall also establish a corresponding

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<sup>16</sup> Definition of "Available Funds" to be added upon effective date of the Twenty-First Supplemental Agreement.

account and the functional provisions for the receipt, deposit and application of such source of income or revenue.

Bondholder of Record -- The registered owner of outstanding fully registered Bonds or Bonds registered as to principal alone (in either case in an aggregate principal amount of at least \$500,000) or any holder of outstanding Bonds who shall have filed with the Secretary-Treasurer of the Authority a request in writing setting forth his name and address and the particular reports, notices or other documents which he desires to receive and which are required to be mailed to bondholders of record under the provisions of the 1978 Trust Agreement. So long as the 2017 Bonds are in book-entry only form, the Bondholder of Record thereof for the purposes of the 1978 Trust Agreement shall be DTC or DTC's partnership nominee (or a successor securities depository). See "THE 2017 BONDS -- Book-Entry Only Method."

Bullet Maturities<sup>17</sup> -- With respect to any Series of Bonds 25% or more of the principal of which matures on the same date or within a fiscal year, that portion of such Series which matures on such date or within such fiscal year; provided, however that the principal amount maturing on any date shall be reduced by the amount of such Bonds scheduled to be amortized by prepayment or redemption prior to their stated maturity date. Notes shall be deemed to be Bullet Maturities for purposes of the 1978 Trust Agreement.

Consultant<sup>18</sup> -- Any Independent consultant, consulting firm (including the Airport Consultants), engineer (including the Consulting Engineers), architect, engineering firm, architectural firm, accountant or accounting firm (including the Accountants), financial advisory or investment banking firm, or other expert recognized to be well-qualified for work of the character required and retained by the Authority to perform acts and carry out the duties provided for such consultant in the 1978 Trust Agreement.

Customer Facility Charges or CFCs<sup>19</sup> -- All amounts received by the Authority from the charges imposed by car rental companies upon car rental customers arriving at Boston Logan International Airport and renting a vehicle from a car rental company serving such Airport, which charges are established by the Authority by resolution.

Designated Debt -- Any Series of Bonds, or portion thereof, with respect to which there shall be in effect a Qualified Hedge Facility.

Government Obligations -- The securities referred to in clause (i) of the definition of Investment Securities. See below.

Independent<sup>20</sup> -- When used with respect to any specified firm or individual, such a firm or individual that (a) does not have any direct financial interest or any material indirect financial interest in the operations of the Authority, other than the payment to be received under

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<sup>17</sup> Definition of "Bullet Maturities" to be added upon effective date of the Twenty-First Supplemental Agreement.

<sup>18</sup> Definition of "Consultant" to be added upon effective date of the Twenty-First Supplemental Agreement.

<sup>19</sup> Definition of "Customer Facility Charges" or "CFCs" to be added upon effective date of the Twenty-First Supplemental Agreement.

<sup>20</sup> Definition of "Independent" to be added upon effective date of the Twenty-First Supplemental Agreement.

a contract for services to be performed, and (b) is not connected with the Authority as an official, officer or employee.

Investment Securities -- Any of the following which at the time of investment are legal investments under the laws of the Commonwealth for the moneys proposed to be invested therein:

Direct obligations of, or obligations the principal of and interest on which are unconditionally guaranteed by, the United States of America;

Bonds, indentures or notes or other evidences of indebtedness issued or guaranteed by any of the following agencies: Bank for Cooperatives; Federal Intermediate Credit Banks; Federal Home Loan Mortgage Corporation; Federal Home Loan Banks; the Federal National Mortgage Association; the United States Postal Service; the Government National Mortgage Association; the Federal Financing Bank; or any other agency or instrumentality of the United States of America now existing or hereafter created;

New Housing Authority Bonds or project notes issued by public agencies or municipalities and fully secured as to the payment of both principal and interest by, respectively, a pledge of annual contributions under an annual contributions contract or contracts or requisition or payment agreements with the United States of America;

Negotiable or non-negotiable bank time deposits evidenced by certificates of deposit issued by banks, trust companies, national banking associations or savings and loan associations (which may include the Trustee) provided that such time deposits are fully insured by the Federal Deposit Insurance Corporation or secured by obligations described in clauses (i), (ii) or (iii) of this definition or by full faith and credit obligations of (a) the Commonwealth or (b) any state of the United States rated in the three highest grades by a nationally recognized rating agency, provided such obligations at all times have a market value at least equal to the maturity value of the deposits so secured, including accrued interest on such deposits;

Repurchase agreements with banks described in clause (iv) of this definition (which may include the Trustee) or government bond dealers reporting to, trading with, and recognized as primary dealers by, a Federal Reserve Bank, the underlying securities of which are obligations described in clauses (i) and (ii) of this definition, provided that the underlying securities are required to be continuously maintained at a market value not less than the amount so invested;

Any bonds or other obligations of any state of the United States of America or of any local government unit of any such state which (1) are rated in the highest rating category by Moody's Investors Service and Standard & Poor's, without regard to gradations within categories, (2) are not callable unless irrevocable instructions have been given to the trustee for such bonds to give due notice of redemption and to call such bonds for redemption on the date(s) specified in such instruments, and (3) are secured by cash and Government Obligations;

Direct and general obligations of any state of the United States of America, to the payment of the principal of and interest on which the full faith and credit of such state is pledged, provided such obligations are rated in either of the two highest rating categories without regard to gradations within categories by Moody's Investors Service and Standard & Poor's;

Obligations of any state of the United States of America or any political subdivision thereof which shall be rated in one of the two highest rating categories by Moody's Investors Service and Standard & Poor's without regard to gradations within categories;

Certificates that evidence ownership of the right to payments of principal of or interest on Government Obligations, provided that (1) such obligations shall be held in trust by a bank or trust company or a national banking association meeting the requirements for a successor Trustee under the 1978 Trust Agreement, (2) the owner of the investment is the real party in interest and has the right to proceed directly and individually against the obligor of the underlying Government Obligations, and (3) the underlying Government Obligations are held in a special account separate from the custodian's general assets, and are not available to satisfy any claim of the custodian, any person claiming through the custodian, or any person to whom the custodian may be obligated;

Commercial paper rated at the time of purchase in the highest rating category, without regard to gradations within such category, by Moody's Investors Service and Standard & Poor's;

Investments or deposits in the Massachusetts Municipal Depository Trust;

Money market funds rated in the highest rating category, without regard to gradations within such category, by Moody's Investors Service and Standard & Poor's;

Investment contracts with banks (which may include the Trustee) or other financial institutions whose long-term unsecured debt or claims-paying ability is rated in one of the two highest rating categories by Moody's Investors Service and Standard & Poor's;

Banker's acceptances rated at the time of purchase in the highest short-term rating category, without regard to gradations within such category, of Moody's Investors Service and Standard & Poor's;

Advance-refunded municipal bonds rated in the highest rating category, without regard to gradations within such category, by Moody's Investors Service ("*Moody's*") and Standard & Poor's Ratings Services, a Division of the McGraw-Hill Companies, Inc. ("*S&P*");

U.S. dollar denominated debt offerings of a multilateral organization of governments rated in the highest rating category, without regard to gradations within such category, by Moody's and S&P;

U.S. dollar denominated corporate bonds, notes or other debt obligations issued or guaranteed by a domestic or foreign corporation, financial institution, non-profit or other entity rated in one of the three highest rating categories, without regard to gradations within such categories, by Moody's Investors Service and S&P;

Negotiable bank certificates of deposit, deposit notes or other deposit obligations issued by a nationally or state chartered bank, credit union or savings association, or by a federally or state-licensed branch of a foreign bank or financial institution, in each case rated in one of the three highest rating categories, without regard to gradations within such categories, by Moody's or S&P; and

Any other investment authorized pursuant to an amendment or supplement to the 1978 Trust Agreement pursuant to Section 1101(g) of the 1978 Trust Agreement.

Section 1101(g) of the 1978 Trust Agreement authorizes modification of the definition of Investment Securities as directed by the Authority, provided that the Authority shall have provided evidence to the Trustee that the details of such modification have been provided in writing to each of Moody's Investors Service (if Moody's Investors Service is then assigning a rating to any outstanding Bonds), Standard & Poor's (if Standard & Poor's is then assigning a rating to any outstanding Bonds) and each other nationally recognized rating agency, if any, then assigning a rating to any outstanding Bonds and that each such rating agency has either (i) confirmed in writing that such modification will not adversely affect the rating it assigns to outstanding Bonds or (ii) issued a rating on a Series of Bonds to be issued which is not lower than the rating assigned by such rating agency to outstanding Bonds prior to such modification, or any other evidence satisfactory to the Trustee that such modification will not adversely affect the then current ratings, if any, assigned to the Bonds by any nationally recognized rating agency.

Operating Expenses -- The Authority's reasonable and necessary current expenses of maintaining, repairing and operating the Projects, including administrative expenses, insurance premiums and payments into the Self-Insurance Account, fees and expenses of the Trustee, engineering expenses relating to operation and maintenance, legal expenses, charges of Paying Agents, payments of annual pension expense and post-retirement health benefits expense, any taxes of general applicability which may be lawfully imposed on the Authority or its income or operations or the property under its control and reserves for such taxes, ordinary and usual expenditures for maintenance and repair, which may include expenses not annually recurring, including such expenditures necessary to maintain the then useful life and operational status of any Project or to keep any Project in its present operational status and all such other costs of maintenance and repair as the Authority may determine to include in Operating Expenses in accordance with sound business practice applied on a consistent basis and any other expenses required to be paid by the Authority under the provisions of the 1978 Trust Agreement or by law on account of the operation or ownership of the Projects, but excluding reserves for operation, maintenance or repair, depreciation allowances or any deposits or transfers to the credit of any of the Funds or Accounts created under the 1978 Trust Agreement except the Self-Insurance Account, pension account and post-retirement health benefits account.



Passenger Facility Charges or PFCs<sup>21</sup> -- The passenger facility charges authorized to be charged by the Authority pursuant to the Aviation Safety and Capacity Expansion Act of 1990, as amended (now codified in Section 40117 of the United States Code).

PFC Revenues<sup>22</sup> -- Amounts derived by the Authority from the imposition of PFCs, exclusive of the amounts retained by the air carriers collecting the PFCs.

Pooled Reserve Subaccount<sup>23</sup> -- The subaccount within the Reserve Account securing all Bonds outstanding prior to the effective date of the Twenty-First Supplemental Agreement and, on and after such effective date, securing those Bonds designated as secured by the Pooled Reserve Subaccount pursuant to a resolution adopted by the Authority.

Principal and Interest Requirements -- With respect to any Series of Bonds, the sum during any fiscal year of (a) interest payable on all Bonds of such Series outstanding which accrues in such fiscal year (less capitalized interest and interest paid or to be paid for such period from moneys in the Construction Fund), (b) principal payable on serial Bonds of such Series on any date commencing with July 2 in such fiscal year and ending with July 1 of the next fiscal year, both inclusive, (c) the Amortization Requirements of term Bonds of such Series, if any, for such fiscal year, plus an amount equal to the premium, if any, which would be payable on any date referred to in subparagraph (b) of this definition on a like principal amount of Bonds if such principal amount of Bonds should be redeemed on such date from moneys in the Interest and Sinking Fund, and (d) the amount required to be deposited in the Term Bond Investment Account (if such an Account is established for such Series of Bonds), if any, for such fiscal year; less income to be accrued during the year on investments in such a Term Bond Investment Account to the extent such income is required to be retained in such Account or deposited in the Bond Service Account or into the Redemption Account.

Regarding the calculation of Principal and Interest Requirements on variable-rate debt, see “SECURITY FOR THE 2017 BONDS -- Additional Bonds”. In computing the Principal and Interest Requirements, Designated Debt which bears interest at a variable rate and with respect to which there exists a Qualified Hedge Facility obligating the Authority to pay a fixed interest rate or a different variable interest rate shall be deemed (for the period during which such Qualified Hedge Facility is reasonably expected to remain in effect and notwithstanding the third paragraph of this definition) to bear interest at the fixed interest rate or different variable rate payable by the Authority pursuant to the Qualified Hedge Facility relating thereto. In computing Principal and Interest Requirements, Designated Debt which bears interest at a fixed rate and with respect to which there exists a Qualified Hedge Facility obligating the Authority to pay a floating rate shall be deemed (for the period during which such Qualified Hedge Facility is reasonably expected to remain in effect) to bear interest equal to the interest payable on the Designated Debt, minus the fixed amounts received or to be received by the Authority under the Qualified Hedge Facility, plus the amount of the floating payments made or to be made by the

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<sup>21</sup> Definition of “Passenger Facility Charges” or “PFCs” to be added upon effective date of the Twenty-First Supplemental Agreement.

<sup>22</sup> Definition of “PFC Revenues” to be added upon effective date of the Twenty-First Supplemental Agreement.

<sup>23</sup> Definition of “Pooled Reserve Subaccount” to be added upon effective date of the Twenty-First Supplemental Agreement.

Authority under the Qualified Hedge Facility (such floating payments not yet made to be determined as provided in the third paragraph of this definition).

In computing the Principal and Interest Requirements, if all or any portion or portions of any outstanding Series of Bonds constitute Bullet Maturities, then each maturity which constitutes Bullet Maturities shall, unless a shorter term was otherwise provided in the resolution of the Authority pursuant to which such Bullet Maturities were issued or unless the next succeeding paragraph then applies to such maturity, be treated as if it were to be amortized over a term of not more than thirty (30) years and with substantially level annual debt service funding payments commencing not later than the year following the year in which such Bullet Maturities were issued, and extending not later than thirty (30) years from the date such Bullet Maturities were originally issued. The interest rate used for such computation shall be that rate determined by a Consultant selected by the Authority to be a reasonable market rate for fixed-rate Bonds of a corresponding term and tenor issued under the 1978 Trust Agreement on the date of such calculation, with no credit enhancement. With respect to any Series of Bonds only a portion of which constitutes Bullet Maturities, the remaining portion shall be treated as described in such other provision of this definition as shall be applicable and, with respect to any such Series of Bonds, or that portion of a Series thereof which constitutes Bullet Maturities, all funding requirements of principal and interest becoming due prior to the year of the stated maturity of the Bullet Maturities shall be treated as described in such other provision of this definition as shall be applicable.

In computing the Principal and Interest Requirements, if any maturity of Bonds which constitutes Bullet Maturities as described in the immediately preceding paragraph of this definition and for which the stated maturity date occurs within twelve (12) months from the date such calculation of Principal and Interest Requirements is made, such maturity shall be assumed to become due and payable on the stated maturity date and the immediately preceding paragraph shall not apply thereto unless there is delivered to an officer of the Authority or Consultant making the calculation of Principal and Interest Requirements a certificate of an authorized officer of the Authority stating that the Authority intends to refinance such maturity and stating the probable terms of such refinancing and that the debt capacity of the Authority is sufficient to successfully complete such refinancing; and upon the receipt of such certificate, such Bullet Maturities shall be assumed to be refinanced in accordance with the probable terms set out in such certificate and such terms shall be used for purposes of calculating Principal and Interest Requirements, provided that such assumption shall not result in an interest rate lower than that which would be assumed under the immediately preceding paragraph and shall be amortized over a term of not more than thirty (30) years from the date of refinancing.

If Available Funds (including state and/or federal grants) have been irrevocably committed or are held by the Trustee or another fiduciary and are to be set aside exclusively to be used to pay principal of, interest or premium, if any, on specified Bonds pursuant to a resolution of the Authority (and are not otherwise required for payment of another Series of Bonds), then the principal, interest and/or premium to be paid from such Available Funds or

from earnings thereon shall be disregarded and not included in calculating Principal and Interest Requirements.<sup>24</sup>

Project -- Any of the Airport Properties, the Port Properties or any Additional Facility financed in whole or in part under the provisions of the 1978 Trust Agreement, either from the proceeds of Bonds or other available funds, including in the case of each such Project all equipment, appurtenances, extensions, enlargements, improvements, renewals and replacements thereof, but shall not include any land, building, structure or other facility financed or refinanced by the Authority by obligations not issued under the provisions of the 1978 Trust Agreement.

Qualified Hedge Facility -- Any interest rate exchange, interest rate cap or other transaction which is intended to convert or limit the interest rate payable with respect to all or part of a particular Series of Bonds and which (a) is with a Qualified Hedge Provider and (b) has been designated in writing to the Trustee by the Authority as a Qualified Hedge Facility with respect to all or part of a particular Series of Bonds;

Qualified Hedge Provider -- A financial institution (a) whose senior long-term obligations are rated not lower than “A1” or the equivalent by Moody’s Investors Service and not lower than “A+” or the equivalent by Standard & Poor’s or (b) whose obligations under each Qualified Hedge Facility (i) are guaranteed by a financial institution, or subsidiary of a financial institution, whose senior long-term debt obligations are rated not lower than “A1” or its equivalent by Moody’s Investors Service and not lower than “A+” or its equivalent by Standard & Poor’s or (ii) are fully secured by investments described in clause (i) or (ii) of the definition of “Investment Securities” which (A) are valued not less frequently than monthly and have a fair market value, exclusive of accrued interest, at all times at least equal to 100% of the Authority’s exposure in respect of such Qualified Hedge Facility, (B) are held by the Trustee or a custodian other than the Qualified Hedge Provider and (C) are subject to a perfected lien in favor of the Authority or the Trustee free and clear of all third-party liens.

Replacement Cost -- As of any date of calculation the then present-day cost to replace or reconstruct all or any of the physical facilities of the Authority to their current use or operational status with materials then used in accordance with sound construction practice but shall exclude (a) the cost to reconstruct or replace all below-ground or below-water foundations and utility improvements and the cost of land, landfill and site improvements and (b) if and to the extent that the Authority shall have so notified the Trustee in writing, the cost to reconstruct or replace any facility financed with the proceeds of obligations other than Bonds, which obligations are not secured by any pledge, lien or charge on, nor payable from, the Revenues or any of the Funds and Accounts created by the 1978 Trust Agreement.

Reserve Requirement<sup>25</sup> -- (a) With respect to the Pooled Reserve Subaccount, the maximum annual Principal and Interest Requirements on all of the outstanding Bonds secured by the Pooled Reserve Subaccount, and (b) with respect to each Series of Bonds issued on and after the effective date of the Twenty-First Supplemental Agreement and not secured by the

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<sup>24</sup> Amendment to the definition of “Principal and Interest Requirements” to be effective upon effective date of the Twenty-First Supplemental Agreement.

<sup>25</sup> Definition of “Reserve Requirement” to be added upon effective date of the Twenty-First Supplemental Agreement.

Pooled Reserve Subaccount, as of any date of calculation for a particular subaccount within the Reserve Account other than the Pooled Reserve Subaccount, the amount of money, if any, required by the resolution adopted by the Authority authorizing the issuance of such Series of Bonds to be maintained in a subaccount in the Reserve Account with respect to such Series of Bonds, which amount shall be available for use only with respect to such Series of Bonds. Any Series of Bonds may be secured by the Pooled Reserve Subaccount, or another specified subaccount within the Reserve Account pursuant to the resolution authorizing such Bonds, if the resolution adopted by the Authority that initially established such account provided for securing more than one Series of Bonds with such subaccount, or the Authority may elect not to establish a subaccount within the Reserve Account to secure such Series of Bonds.

Revenues -- All moneys derived or to be derived by the Authority in payment of tolls, rates, fees, rentals and other charges for the use of, and for the services and facilities furnished by, the Projects, any proceeds of use and occupancy and liability insurance (but not casualty insurance proceeds or awards for damages), the proceeds of leases, licenses, permits and concessions, and other income from the ownership or operation of the Projects, including income from investments except those in the Construction Fund, the Self-Insurance Account, any pension or post-retirement health benefit account in the Operating Fund and the Term Bond Investment Account; but excluding (i) moneys derived from facilities financed with the proceeds of obligations not secured by or payable from Revenues to the extent such moneys are pledged to the payment of such obligations, (ii) proceeds of casualty insurance or awards for damages, (iii) proceeds of sales of Bonds, (iv) proceeds of the sale or other disposition of property pursuant to the 1978 Trust Agreement and (v) except to the extent from time to time provided by the Authority by resolution, the proceeds of any passenger facility charge or similar tax levied by or on behalf of the Authority pursuant to the Federal Aviation Safety and Capacity Act of 1990 as from time to time amended, and any successor thereto, and the proceeds of any other charge or tax from time to time levied by or on behalf of the Authority pursuant to any federal statute or regulation enacted or promulgated after May 15, 2003 which restricts the use of such proceeds to purposes identified in or pursuant to such statute or regulation. The Authority has excluded from Revenues the proceeds of PFCs and CFCs. Notwithstanding the foregoing to the contrary, Revenues shall also include Available Funds in the amount, for the period and subject to such conditions as may be provided by a resolution of the Authority.<sup>26</sup> See “SECURITY FOR THE 2017 BONDS – Other Revenues of the Authority Not Pledged as Security for the Bonds – Passenger Facility Charges” and “—Customer Facility Charges.”

Term Bond Investment Account -- For a Series of Bonds shall mean each Account so designated which is established in the Interest and Sinking Fund for the term Bonds of such Series pursuant to the resolution of the Authority authorizing the issuance of such Series of Bonds. (No such Account will be established for any of the 2017 Bonds.)

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<sup>26</sup> Amendment to the definition of “Revenues” to be effective upon effective date of the Twenty-First Supplemental Agreement.

## APPENDIX F

### AUTHORITY REQUEST FOR WRITTEN CONSENT TO PROPOSED AMENDMENTS

MASSACHUSETTS PORT AUTHORITY

\$ \_\_\_\_\_ Revenue Bonds, Series 2017-A (AMT)

Anticipated Sale Date: July 11, 2017

Anticipated Delivery Date: July 19, 2017

To: Prospective purchasers of the above bonds (the “*Series 2017 Bonds*”)

The Massachusetts Port Authority (the “*Authority*”) understands that you have indicated your intention to purchase Series 2017 Bonds of certain series, maturities and amounts. In that regard, the Authority is hereby advising you that the sale of the Series 2017 Bonds by the Authority to the underwriters named in the Preliminary Official Statement prepared by the Authority in connection with the offering of the Series 2017 Bonds (the “*POS*”) and the subsequent sale of the Series 2017 Bonds by such underwriters to you is conditioned upon receipt of your written consent to the proposed amendments to the 1978 Trust Agreement (as defined in the POS) described in the POS (the “*Consent Amendments*”). The text of the Consent Amendments is available from the Authority or the Trustee. A general description of the Consent Amendments is provided in the POS under the caption “SECURITY FOR THE 2017 BONDS-Modifications of the 1978 Trust Agreement”.

In order to become effective, the Consent Amendments require, among other things, the written consent of the Holders of not less than 51% of the Bonds outstanding under the 1978 Trust Agreement. Accordingly, the Authority is requesting that you evidence your consent to the Consent Amendments by executing the acknowledgement set forth below. The underwriters have not been requested to provide, nor will they provide, consent to the Consent Amendments on behalf of any Series 2017 Bond purchaser. The Authority currently anticipates the Consent Amendments becoming effective no earlier than calendar year 2018; however, such effective date may be sooner or later than such calendar year, or may never occur.

By signing in the space provided below:

- (1) you acknowledge you have read and understand the foregoing;
- (2) you hereby provide your express and irrevocable written consent to the Consent Amendments and you approve execution and delivery of the Twenty-first Supplemental Agreement as provided in the POS, such consent and approval to be effective immediately upon, and simultaneously with, the delivery of the Series 2017 Bonds to your custodial account with your DTC Participant;

- (3) you hereby waive any publication and mailing of notice of the Consent Amendments pursuant to the provisions of the 1978 Trust Agreement;
- (4) you irrevocably waive any right under the 1978 Trust Agreement to any publication that the Consent Amendments have received the necessary Bondholder consent; and
- (5) you agree that you are the purchaser or beneficial holder of the principal amount of the Series 2017 Bonds identified below or you are authorized to execute and deliver this consent on behalf of the purchaser of such Bonds and that a facsimile signature and signature page provided in the form of a “pdf” or similar imaged document transmitted by electronic mail or facsimile shall be deemed an original signature for all purposes.

If you are in agreement with the foregoing, please so indicate by signing and dating in the spaces provided below, having this Consent witnessed and returning this letter to Robyn Davies at Barclays Capital Inc. via Email at [robyn.davies@barclays.com](mailto:robyn.davies@barclays.com); for questions, please call Ms. Davies at (212) 526-8401.

Very truly yours,

MASSACHUSETTS PORT AUTHORITY

ACKNOWLEDGED AND AGREED:

Print name of Purchaser or Managing Firm (having authority to consent on behalf of the Purchaser):

\_\_\_\_\_

Custodian/DTC Participant Name: \_\_\_\_\_

DTC Participant No.: \_\_\_\_\_

Name(s) of funds which the Managing Firm is authorized to provide consent for:

\_\_\_\_\_

Purchaser or Authorized Employee of Managing Firm:

\_\_\_\_\_ (Print Name)

\_\_\_\_\_ (Sign Name)

Date: \_\_\_\_\_, 2017

WITNESS AFFIDAVIT

I, \_\_\_\_\_ (name of witness), the \_\_\_\_\_ (title) of \_\_\_\_\_ (firm) hereby certify that I have witnessed the execution of this Consent and that the person signing this Consent is known to me and has the authority to provide the foregoing Consent.

By: \_\_\_\_\_

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**FORM OF CONTINUING DISCLOSURE CERTIFICATE**

This Continuing Disclosure Certificate (the “Disclosure Certificate”) is executed and delivered by the Massachusetts Port Authority (the “Issuer”) in connection with the issuance of one or more series of bonds by or on behalf of the Issuer and designated by duly adopted resolution of the Issuer as subject to and having the benefits of this Disclosure Certificate (such bonds referred to herein collectively as the “Bonds”). The Issuer covenants and agrees as follows:

SECTION 1. Purpose of the Disclosure Certificate. This Disclosure Certificate is being executed and delivered by the Issuer for the benefit of the owners of Bonds and in order to assist Participating Underwriters in complying with the Rule (as defined below).

SECTION 2. Definitions. In addition to terms defined elsewhere in this Disclosure Certificate, the following capitalized terms shall have the following meanings:

“Annual Filing” shall mean any Annual Filing provided by the Issuer pursuant to, and as described in, Sections 3 and 4 of this Disclosure Certificate.

“Dissemination Agent” shall mean Digital Assurance Certification, L.L.C., acting in its capacity as dissemination agent for the Issuer pursuant to the Disclosure Dissemination Agent Agreement dated as of January 8, 2010, between the Issuer and Digital Assurance Certification, L.L.C., or any successor thereto designated in writing by the Issuer as its agent for purposes of satisfying the filing and notice requirements assumed by the Issuer under this Disclosure Certificate, and which successor has filed with the Issuer a written acceptance of such designation.

“Listed Events” shall mean any of the events listed in Section 5(a) of this Disclosure Certificate.

“MSRB” means the Municipal Securities Rulemaking Board established pursuant to Section 15B(b)(1) of the Securities Exchange Act of 1934, or any successor thereto or to the functions of the MSRB contemplated by this Disclosure Certificate. Until otherwise designated by the MSRB or the Securities and Exchange Commission, filings with the MSRB are to be made through the Electronic Municipal Market Access (EMMA) website of the MSRB, currently located at <http://emma.msrb.org>.

“Owners of the Bonds” or “Owners” shall mean the registered owners, including beneficial owners, of the Bonds.

“Participating Underwriters” shall mean the original underwriters of any Bonds required to comply with the Rule in connection with the offering of such Bonds.

“Rule” shall mean Rule 15c2-12 adopted by the Securities and Exchange Commission under the Securities Exchange Act of 1934, as the same may be amended from time to time.

“Trust Agreement” shall mean the Trust Agreement dated as of August 1, 1978, as amended and supplemented, between the Issuer and State Street Bank and Trust Company, as Trustee.

SECTION 3. Provision of Annual Filings.

(a) The Issuer shall, or shall cause the Dissemination Agent to, not later than January 1 of each year, commencing January 1, 2013, provide to the MSRB an Annual Filing that is consistent with the requirements of Section 4 of this Disclosure Certificate. The Annual Filing may be submitted as a single document or as separate documents comprising a package, and may cross-reference other information as provided in Section 4 of this Disclosure Certificate; provided that the audited financial statements of the Issuer may be submitted, when available, separately from the balance of the Annual Filing.

## APPENDIX G

(b) If the Issuer is unable to provide the Annual Filing to the MSRB by the date required in subsection (a), the Issuer shall send, or cause the Dissemination Agent to send, a notice in a timely manner to the MSRB in substantially the form attached as Exhibit A.

SECTION 4. Content of Annual Filings. The Issuer's Annual Filing shall contain or incorporate by reference the following:

(a) operating data for, or as of the end of, the preceding fiscal year of the type presented in the Issuer's most recent official statement, including data relating to (i) the market shares of total Airport passenger traffic, (ii) the percentage of passengers traveling on U.S. air carrier airlines between the Airport and other final domestic destinations, (iii) general Airport traffic statistics and (iv) cargo and passenger activity relating to the Port Properties;

(b) financial information for, or as of the end of, the preceding fiscal year of the type presented in the Issuer's most recent official statement, including a summary of operating results and debt service coverage; and

(c) the most recently available audited financial statements of the Issuer, prepared in accordance with generally accepted accounting principles. (If audited financial statements for the preceding fiscal year are not available when the Annual Filing is submitted, the Annual Filing will include unaudited financial statements for the preceding fiscal year.)

Any or all of the items listed above may be incorporated by reference from other documents, including official statements of debt issues of the Issuer or related public entities, which (i) are available to the public on the MSRB's Internet Web site or (ii) have been filed with the Securities and Exchange Commission. The Issuer shall clearly identify each such other document so incorporated by reference.

### SECTION 5. Reporting of Significant Events.

(a) The Issuer shall give notice, or shall cause the Dissemination Agent to give notice, in accordance with subsection 5(b) below, of the occurrence of any of the following events with respect to any Bonds:

- (i) Principal and interest payment delinquencies.
- (ii) Non-payment related defaults, if material.
- (iii) Unscheduled draws on debt service reserves reflecting financial difficulties.
- (iv) Unscheduled draws on credit enhancements reflecting financial difficulties.
- (v) Substitution of credit or liquidity providers, or their failure to perform.
- (vi) adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determination of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the Bonds, or other material events affecting the tax status of the Bonds.
- (vii) Modifications to rights of any Owners of the Bonds, if material.
- (viii) Optional, contingent or unscheduled calls of Bonds, if material, and tender offers.
- (ix) Defeasance of any Bonds or any portion thereof.
- (x) Release, substitution or sale of property securing repayment of any Bonds, if material.
- (xi) Rating changes.

- (xii) Bankruptcy, insolvency, receivership or similar event of the Issuer.\*
- (xiii) The consummation of a merger, consolidation, or acquisition involving the Issuer or the sale of all or substantially all of the assets of the Issuer, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material.
- (xiv) Appointment of a successor or additional trustee or the change of name of the Trustee, if material.

(b) Upon the occurrence of a Listed Event, the Issuer shall, in a timely manner not in excess of ten (10) business days after the occurrence of the event, file, or cause the Dissemination Agent to file, a notice of such occurrence with the MSRB.

(c) Anything in this Section 5 to the contrary notwithstanding, the Issuer shall have no obligation to give notice of or otherwise report any Listed Event with respect to any series of Bonds as to which another obligated person (as such term is defined in the Rule) has entered into an undertaking to provide such notice in accordance with the Rule.

SECTION 6. Transmission of Information and Notices. Unless otherwise required by law, all notices, documents and information provided to the MSRB shall be provided in electronic format as prescribed by the MSRB and shall be accompanied by identifying information as prescribed by the MSRB.

SECTION 7. Termination of Reporting Obligation. The Issuer's obligations under this Disclosure Certificate shall terminate upon the defeasance, prior redemption or payment in full of all of the Bonds.

SECTION 8. Amendment; Waiver. Notwithstanding any other provision of this Disclosure Certificate, the Issuer may amend this Disclosure Certificate and any provision of this Disclosure Certificate may be waived, if such amendment or waiver is permitted by the Rule, as evidenced by an opinion of counsel expert in federal securities laws to the effect that such amendment or waiver would not, in and of itself, cause the undertakings herein to violate the Rule if such amendment or waiver had been effective on the date hereof but taking into account any subsequent change in or official interpretation of the Rule.

If the amendment provides for a change in the accounting principles to be followed in preparing financial statements, the Annual Filing for the year in which the change is made shall present a comparison between the financial statements or information prepared on the basis of the new accounting principles and those prepared on the basis of the former accounting principles. The comparison shall include a qualitative discussion of the differences in the accounting principles and the impact of the change in the accounting principles on the presentation of the financial information in order to provide information to investors to enable them to evaluate the ability of the Issuer to meet its obligations. To the extent reasonably feasible, the comparison shall also be quantitative. A notice of the change in the accounting principles shall be sent to the MSRB.

SECTION 9. Default. In the event of a failure of the Issuer to comply with any provision of this Disclosure Certificate, any Owner of any Bonds may seek a court order for specific performance by the Issuer of its obligations under this Disclosure Certificate. A default under this Disclosure Certificate shall not be deemed an event of default under the Trust Agreement, and the sole remedy under this Disclosure Certificate in the event of any failure of the Issuer to comply with this Disclosure Certificate shall be an action to compel performance of the Issuer's obligations hereunder and not for money damages in any amount.

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\* As noted in the Rule, this event is considered to occur when any of the following occur: (i) the appointment of a receiver, fiscal agent or similar officer for the Issuer in a proceeding under the U.S. Bankruptcy Code or in any proceeding under state or federal law in which a court or governmental authority has assumed jurisdiction over substantially all of the assets or business of the Issuer, or if such jurisdiction has been assumed by leaving the existing governing body and officials or officers in possession but subject to the supervision and orders of a court or governmental authority, or (ii) the entry of an order confirming a plan of reorganization, arrangement or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the Issuer.

## APPENDIX G

SECTION 10. Beneficiaries. This Disclosure Certificate shall inure solely to the benefit of the Issuer, Participating Underwriters and Owners from time to time of the Bonds, and shall create no rights in any other person or entity.

SECTION 11. Governing Law. This instrument shall be governed by the laws of The Commonwealth of Massachusetts.

[Remainder of page intentionally left blank.]

IN WITNESS WHEREOF, the Issuer has caused this Disclosure Certificate to be duly executed under seal as of the date hereof.

Date: July 19, 2012

MASSACHUSETTS PORT AUTHORITY

By \_\_\_\_\_  
Title: Director of Administration & Finance/  
Secretary-Treasurer

**APPENDIX G**

EXHIBIT A

NOTICE OF FAILURE TO FILE ANNUAL FILING

Name of Issuer: Massachusetts Port Authority

NOTICE IS HEREBY GIVEN that the Issuer has not provided an Annual Filing as required by the Continuing Disclosure Certificate of the Issuer dated as of July 19, 2012. The Issuer anticipates that the Annual Filing will be filed by \_\_\_\_\_.

Dated: \_\_\_\_\_

[DISSEMINATION AGENT],  
on behalf of the Issuer

By \_\_\_\_\_

cc: Massachusetts Port Authority

**APPENDIX H**

**ATTORNEYS AT LAW**

111 HUNTINGTON AVENUE  
BOSTON, MASSACHUSETTS 02199  
617.342.4000 TEL  
617.342.4001 FAX  
WWW.FOLEY.COM

CLIENT/MATTER NUMBER  
071193-0136

July \_\_, 2017

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

Re: Massachusetts Port Authority \$ \_\_\_\_\_  
Revenue Bonds, Series 2017-A (AMT)

Ladies and Gentlemen:

We have acted as bond counsel to the Massachusetts Port Authority (the “*Authority*”) in connection with the issuance by the Authority of its Revenue Bonds, Series 2017-A (AMT) (the “*2017 Bonds*”). The 2017 Bonds are issued pursuant to Chapter 465 of the Massachusetts Acts of 1956, as amended (the “*Act*”), the Trust Agreement dated as of August 1, 1978, as supplemented and amended through the Twentieth Supplemental Agreement dated as of July 18, 2015 (as so supplemented and amended, the “*Trust Agreement*”), by and between the Authority and U.S. Bank National Association, as successor-in-interest to State Street Bank and Trust Company, as trustee (the “*Trustee*”), and the Issuance Resolution adopted by the Members of the Authority on June 15, 2017 (the “*Resolution*”). All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Trust Agreement.

As bond counsel, we have examined the law, the Trust Agreement, the Resolution, the by-laws of the Authority, and a certified copy of the proceedings relating to the issuance of the 2017 Bonds. As to questions of fact material to our opinion, we relied upon those certified proceedings and certifications of Authorized Officers (as defined in the Resolution) of the Authority and other certifications of public officials and others furnished to us in connection therewith without independently undertaking to verify them.

Neither The Commonwealth of Massachusetts (the “*Commonwealth*”) nor any political subdivision thereof, other than the Authority, is obligated to pay any of the 2017 Bonds or the interest thereon, and neither the faith and credit nor the taxing power of the Commonwealth or any political subdivision thereof is pledged to the payment of the principal of or interest on the 2017 Bonds. The 2017 Bonds are secured on a parity with other Bonds heretofore and hereafter issued pursuant to the Trust Agreement and are secured by and payable solely from Revenues available therefor under the Trust Agreement. The Authority has no taxing power.

BOSTON  
BRUSSELS  
CHICAGO  
DETROIT

JACKSONVILLE  
LOS ANGELES  
MADISON  
MIAMI

MILWAUKEE  
NEW YORK  
ORLANDO  
SACRAMENTO

SAN DIEGO  
SAN FRANCISCO  
SHANGHAI  
SILICON VALLEY

TALLAHASSEE  
TAMPA  
TOKYO  
WASHINGTON, D.C.

Massachusetts Port Authority

July \_\_\_\_, 2017

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Based on the foregoing, we are of the opinion that, under existing law:

1. The Authority is a body politic and corporate and public instrumentality of the Commonwealth duly created by the Act, with all necessary power and authority to adopt the Resolution, perform its obligations under the Resolution, and issue the 2017 Bonds.

2. The 2017 Bonds have been duly authorized, executed, and delivered by the Authority, and, assuming that the 2017 Bonds have been authenticated as provided in the Act and the Trust Agreement, the 2017 Bonds constitute legal, valid, and binding obligations of the Authority, enforceable in accordance with their terms and entitled to the benefits and security of the Resolution and the Trust Agreement.

3. The Resolution and the Trust Agreement are authorized by the Act, the Trust Agreement has been duly authorized, executed and delivered by the Authority, and the Resolution and the Trust Agreement constitute legal, valid and binding obligations of the Authority, enforceable against the Authority in accordance with their respective terms.

4. The interest on the 2017 Bonds is excluded from gross income for federal income tax purposes, except for interest on any 2017 Bond for any period during which such 2017 Bond is held by a person who is a “substantial user” of the facilities financed with proceeds of the 2017 Bonds or a “related person” of such a substantial user within the meaning of Section 147(a) of the Internal Revenue Code of 1986, as amended (the “*Code*”). Interest on the 2017 Bonds is a specific preference item for purposes of the federal individual or corporate alternative minimum taxes. The opinions set forth in this paragraph are subject to the condition that the Authority comply with various requirements imposed by the Code that must be complied with after the 2017 Bonds are issued for interest on the 2017 Bonds to be, or continue to be, excluded from gross income for federal income tax purposes. The Authority has covenanted in the Trust Agreement and the Resolution that it will not take or permit to be taken on its behalf any action that would adversely affect the exemption from federal income taxation of the interest on the 2017 Bonds and that it will take or require to be taken such actions as may be reasonably within its ability and as may be required under applicable law to continue the exemption from federal income taxation of the interest on the 2017 Bonds. The Authority’s failure to comply with such covenants may result in the inclusion of interest on the 2017 Bonds in gross income for federal income tax purposes, in some cases retroactively to the date the 2017 Bonds were issued. We have not undertaken to determine (or to inform any person) whether any actions taken (or not taken) or events occurring (or not occurring) after the date of issuance of the 2017 Bonds may adversely affect the tax status of interest on the 2017 Bonds. We express no opinion regarding any other federal tax consequences arising with respect to the 2017 Bonds.

5. The 2017 Bonds, their transfer, and the income therefrom (including any profit made on the sale thereof) are exempt from taxation by the Commonwealth. We express no opinion as to





FOLEY & LARDNER LLP

Massachusetts Port Authority

July \_\_, 2017

Page 3

whether the 2017 Bonds or the interest thereon are included in the measure of Commonwealth estate and inheritance taxes and certain Commonwealth corporation excise and franchise taxes. We express no opinion regarding other Commonwealth tax consequences arising with respect to the 2017 Bonds or regarding the tax consequences under the laws of states other than the Commonwealth.

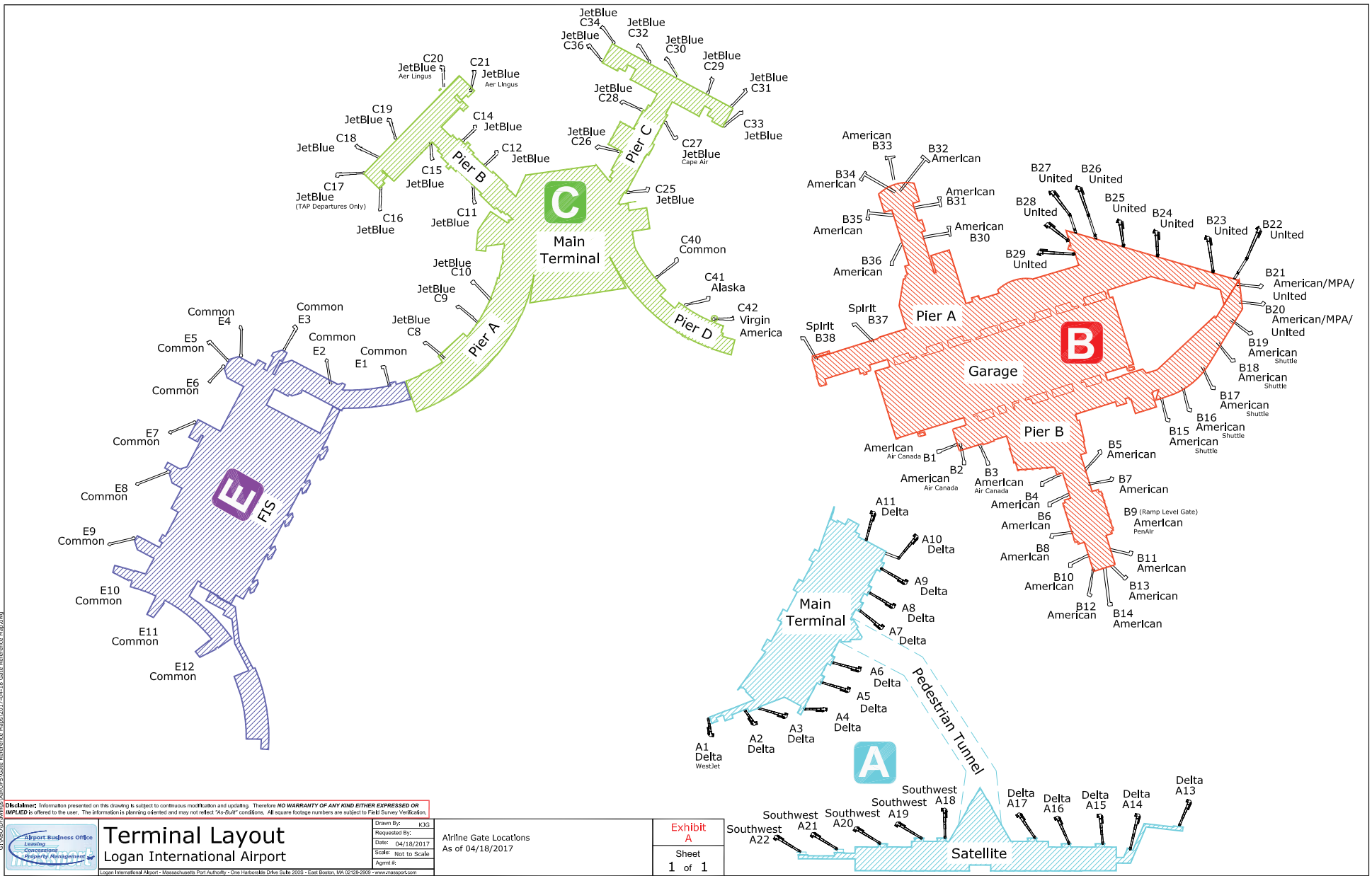
The rights of the owners of the 2017 Bonds and the enforceability of the 2017 Bonds, the Trust Agreement, and the Resolution may be limited by bankruptcy, insolvency, reorganization, moratorium, and other similar laws affecting creditors' rights, and by equitable principles (which may be applied in either a legal or an equitable proceeding). We express no opinion as to the availability of any particular form of judicial relief.

Except as set forth in our supplemental opinion of even date, we have not been engaged or undertaken to review the accuracy, completeness, or sufficiency of the Official Statement dated July \_\_, 2017 or other offering materials relating to the 2017 Bonds (except to the extent, if any, stated in the Official Statement), and we express no opinion as to those matters (except only the matters set forth as our opinion in the Official Statement). We have not passed on any matters relating to the business, affairs, or condition (financial or otherwise) of the Authority and no inference should be drawn that we have expressed any opinion on matters relating to the ability of the Authority to perform its obligations under the Trust Agreement or the Resolution.

This letter speaks as of its date. We assume no duty to change this letter to reflect any facts or circumstances that later come to our attention or any changes in law. We express no opinion as to laws other than the laws of the Commonwealth and the federal laws of the United States of America. In acting as bond counsel, we have established an attorney-client relationship solely with the Authority.

Very truly yours,

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Disclaimer: Information presented on this drawing is subject to continuous modification and updating. Therefore NO WARRANTY OF ANY KIND EITHER EXPRESSED OR IMPLIED is offered to the user. The information is planning oriented and may not reflect "As-Built" conditions. All square footage numbers are subject to FIM Survey Verification.



# Terminal Layout Logan International Airport

Drawn By: KJC  
 Requested By:  
 Date: 04/18/2017  
 Scale: Not to Scale  
 Xrefs: E

Airline Gate Locations  
 As of 04/18/2017

Exhibit  
 A  
 Sheet  
 1 of 1

Logan International Airport - Massachusetts Port Authority - One International Drive Suite 2005 - Civil Boston, MA 02133-2909 - www.massport.com

