

DRAFT FINAL REPORT

2019 LOGAN INTERNATIONAL AIRPORT
AIR PASSENGER GROUND-ACCESS SURVEY

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1. INTRODUCTION

Overview

This report presents the results of the 2019 Air Passenger Ground-Access Survey conducted at Logan International Airport. It describes the methodology used in the design, conduct, and administration of the survey, and compares the results with surveys conducted in previous years.

Background

Since 1979 Massport has conducted a survey of departing air passengers for the purposes of gathering information on ground-access patterns at Logan International Airport. The first ground-access survey was conducted in April of that year, and the survey has been conducted about every three years since. Specifically, surveys were conducted in April 1979, April 1984, August 1984, April/May 1987, April/May 1990, April/May 1993, April/May 1996, April/May 1999, October 2003, April/May 2007, April/May 2010, April/May 2013, and April/May 2016. An unrelated large scale ground-access survey was also conducted at Logan as part of the New England Regional Aviation System Plan Update in 2004. A ground-access survey was also conducted in October 2018 utilizing a different design and methodology than the triennial survey to support the market analysis for the Logan Airport Parking Freeze Amendment Ground Access and Trip Reduction Strategy Studies (“Parking Freeze Study”) project.

This triennial survey is designed to help Massport monitor ground-access patterns and other important characteristics of departing air passengers in order to both measure the impact of recent changes in ground-access facilities or services, and to plan future ground-access improvements. The survey is the primary tool used to determine air passenger ground-access mode share.

Changes since 2016

A number of important changes have occurred since the prior survey. Overall demand for air traffic has also increased by approximately 20% since the 2016 survey was conducted. New domestic and/or international airlines and non-stop services have been introduced, and Low Cost Carriers (LCCs)—including international LCCs—have continued their growth at Logan.

Logan landside infrastructure has experienced significant demand growth corresponding to overall increases in aviation activity, and Massport has implemented numerous ground access initiatives over the past three years to accommodate and manage these changes. Infrastructure has been repurposed to accommodate pick-ups by Transportation Network Companies (TNCs), and Massport is in the process of implementing further improvements to centralize TNC pick-ups and drop-offs to improve operations and mitigate the congestion impacts of their rapid growth. At the time of this survey, Massport began implementing elements of a significant Logan Express expansion in order to offer air passengers additional non-automobile ground access alternatives. Numerous additional investments have entered planning, design, and construction since 2016, whose impacts will be observed in future air passenger ground access surveys.

Massport also received regulatory approval to lift the decades-old Parking Freeze¹ at Logan in order to mitigate unintended negative environmental consequences of its constrained parking capacity. The Parking Freeze Study, required by the updated regulation, is an important part of this effort, and based on this work Massport has redefined High-Occupancy Vehicles (HOVs) to better represent shared rides in non-transit modes for the purposes of calculating ground access mode shares. Specifically, the change in HOV definition can be summarized as follows:

- Previously, HOV share was computed as the share of ground access trips made by public transit or on other shared ride modes (including car service, shared ride van or limo, courtesy shuttle, charter bus, or water taxi).
- Under the new definition, HOV share includes trips by public transit or shared ride modes (including shared ride van or limo, courtesy shuttle, charter bus, or water taxi), as well as trips made by taxi, TNC, or car service where the vehicle occupancy is larger than one.²

The new mode share calculation methodology will be used in the agency's environmental reporting, beginning with the 2018 Environmental Data Report, and the 2019 Air Passenger Survey provides much needed and timely data using this improved definition.

Survey objectives

The primary objectives of the 2019 survey were as follows:

- *Assess ground access mode share.* The survey is the principal tool used to estimate the ground-access mode share of air passengers traveling to Logan Airport. High-Occupancy Vehicle (HOV) mode share is a key metric reported in the annual environmental documentation for Logan Airport.
- *Provide information on air passenger characteristics.* Results of the survey are used to provide a profile of air passengers and understand what influences their ground-access mode choices.
- *Update the existing data.* The triennial survey was last conducted in 2016, and the results of the 2019 study provide a current picture of air passenger ground-access travel behavior.
- *Examine how patterns have changed.* The survey results will allow Massport to understand how travel to and from the airport has changed since 2016, as well as to study the longer term trends illuminated by comparison with data from earlier years.
- *Understand the effects of new infrastructure projects.* The new data will also shed light on the impacts of the changes in the accessibility of the airport described above.

¹ See 310 Code of Massachusetts Regulations 7.30 and CFR 52.1120 for more details on the Logan Airport Parking Freeze.

² Under both the previous and new definitions the very small fraction of trips classified as "other" and representing neither shared ride nor private vehicle modes (i.e., walk, bicycle, etc.) are included in HOV share.

The overriding objective was therefore to compare the results to those of prior years so that the trends in ground-access can be clearly identified. The survey results are used in long-range operational and capital project planning, and Massport will use the data to identify ground-access market areas that are currently underserved by HOV services.

The 2019 survey employed all-electronic data collection, marking a departure from primarily paper-based administration in previous triennial surveys. Therefore, a further objective of this year's survey was therefore also to verify the implications of this new method for cost effectiveness, fieldwork efficiency and logistics, and sampling methodology.

Summary of survey administration

- In total 252 flights were surveyed over a two week period, achieving a final sample of 8,763 responses.
- Transition to electronic tablets was successfully achieved, with savings in both time and cost from more automated data collection, but some additional time and cost given the (as expected) lower productivity vs. the prior pencil-and-paper method.
- Fieldworker productivity was consistent with our prior estimates, and the sample size target was again exceeded, but productivity could be improved further through refinements to fieldwork logistics.

Summary of survey results

- HOV share was 40.5% in 2019 under the new definition, which is slightly below the level that would have obtained had the new method be used in 2016 (41.7%).
- TNC share has more than doubled, having increased from 14.3% to 29.5% today, and evidently drawing share from both automobile and HOV/transit modes.
- Continued TNC growth has evidently drawn share from other modes, with taxicab continuing its steep decline and Private Vehicle experiencing a more modest reduction, most notably in the Drop Off category.
- The net effect of these changes is an increase in the overall share of automobile modes corresponding to the previous Massport definition of single-occupancy vehicle (SOV) from 69.5% in 2016 to 76.2% in 2019.
- Shares of HOV mode ridership associated with bus and rail public transit have fallen from a total of 16.3% in 2016 to 12.5% in 2019, with Logan Express reversing its prior gains, the Blue Line losing more than half its market share, and the Silver Line experiencing almost as large a decline from 3.3% to 1.8% of trips since 2016.

Organization of this report

The following chapter provides a description of the survey methodology. Chapter 3 provides a summary of the survey results, highlighting changes in key metrics from prior years. Detailed results are presented in Chapter 4. Finally, Chapter 5 provides conclusions and recommendations for subsequent surveys at Logan.

2. SURVEY METHODOLOGY

Overview

This chapter describes the methodology used for the 2019 Logan Airport Air Passenger Ground-Access Survey. It provides details on the development of the survey questionnaire, sample design, survey administration, data cleaning, sample weighting, and production of the final database.

The methodology used in this survey employed the key elements of the project team's standard procedures for airport passenger surveys. Specifically, these include:

- Surveying only departing true origin-destination (not connecting) air passengers, and doing so only in the gate lounge area;
- Using a two-stage sampling technique, with a representative stratified sample of scheduled flights selected as the first-stage sample;
- Using a self-completion questionnaire intended for distribution to all eligible passengers assembled in the gate areas for sample flights, and collecting completed questionnaires from most of them before departure;
- Facilitating the completion of questionnaires from passengers unable to complete the survey before boarding (particularly people arriving at the gate area close to the departure time); and
- Using boarding counts provided by the airlines as the basis for weighting the achieved sample in a manner that uses knowledge of travel party size to refine the resulting picture of aggregate ground-access behavior.

This strategy has a number of advantages by comparison with alternative methods:

- The costs per completed survey are lower than would be the case for an in-person interview of comparable length and the data quality is frequently of a comparable or better standard.
- Sampling flights provides the best statistical base for drawing a fully representative sample of all departing passengers, as explained further in the Sample Weighting section.
- Intercepting passengers while they wait in gate lounge areas to board flights results in a significantly higher response rate, in our experience, than attempting to intercept them at any other point in their (often luggage-laden or harried) passage through the airport. Moreover, it is the only sampling method where the relative probabilities of selection are known with a fair degree of accuracy.
- The option of completing the survey after departure is designed to address the "late arriver" problem. With surveys using only in-person interviews, late arrivers are ignored,

yet they may represent a significant share of the passengers on high-frequency business-heavy routes (such as the "shuttle" flights between Boston and New York and Washington), and their ground-access behaviors may well be correlated with their "just in time" approach to catching the flight.

An important change for the 2019 survey was the introduction of all-electronic data collection. The triennial Logan Air Passenger Survey had used a pencil-and-paper questionnaire for all iterations prior to 2019. A White Paper³ co-authored by members of the study team subsequent to the 2013 survey had assessed the feasibility and pros and cons of transitioning the survey to electronic data collection, and a small-scale pilot electronic survey was subsequently tested in parallel with the 2016 survey. Most recently, the 2018 survey conducted as part of the Parking Freeze Study successfully used all electronic data collection for a ground-access survey of about 5,000 departing air passengers.

Based on this history, the decision was made by Massport to conduct the 2019 survey using electronic data collection. More specifically, the survey was administered using tablets (iPads) connected via cellular and WiFi connection to a digital version of the questionnaire hosted online.

The following sections describe in more detail how this methodology was implemented in the design and administration of the survey.

Questionnaire design

The questionnaire was developed by the project team in active consultation with Massport staff. The basic philosophy was to follow the general content of the 2016 survey, and reflect insights from a variety of other sources:

- Our experience in designing and conducting self-completion departing passenger surveys at a variety of other airports generally;
- The surveys of departing passengers that we've carried out at Logan in prior years; *and*
- Updating the survey content to introduce some new questions and remove some of the old questions judged to be less useful.

The use of electronic data collection removed the prior limitation of needing to fit the questionnaire content within the confines of a six-panel paper form, but we nevertheless sought to limit the questionnaire length so as not to diminish the response rate. The aim was to limit the questionnaire length such that the survey would take no more than about ten minutes to complete, which translated into a total length consistent with prior surveys.

A draft of the questionnaire was prepared by the project team, informed by the set of questions contained on the 2016 form and a discussion with Massport staff, and formatted in a manner similar to that used in 2016. The draft was circulated among Massport staff for comments. A number of changes were requested, mostly in the form of additional questions not previously

³ *White Paper on Future Departing Passenger Surveys*, by Steer Davies Gleave, Mark Kiefer Consulting, and Andrew Desautels, prepared for Massport, June 13, 2014.

appearing on the form, the expansion of existing questions to provide more detail, or the removal of some questions deemed no longer necessary.

The following questions were added to assess the potential impacts of airport security “head of the line” privileges and covered parking on Logan Express usage:

Certain airline or government programs, either based on status or for a fee, provide for expedited security screening, effectively allowing you to “skip to the head of line.”

a. Which of the following of these programs have you used or are you aware of? (check all that apply)?

- | | |
|--|--|
| <input type="checkbox"/> Even More Speed (jetBlue) | <input type="checkbox"/> TSA Pre-Check |
| <input type="checkbox"/> Priority Privileges (American) | <input type="checkbox"/> Global Entry |
| <input type="checkbox"/> Sky Priority (Delta) | <input type="checkbox"/> NEXUS |
| <input type="checkbox"/> Premier Access (United) | <input type="checkbox"/> Clear |
| <input type="checkbox"/> Flyby Priority Lane (Southwest) | <input type="checkbox"/> None of the above |

b. How often do you or have you used the Logan Express bus service for your travel to Logan Airport?

- Often Sometimes Never

c. How likely would you be to use Logan Express for your travel to Logan Airport if it included “head of the line” privileges like those programs described above, at no additional cost?

- Very unlikely Unlikely Likely Very likely Not sure/can't say

d. [Q1.4 e = Framingham] How important was the availability of covered parking (a parking garage) at the Framingham terminal in your decision to use Logan Express?

- Not important Somewhat Important Very Important

e. [Q1.4 e = Braintree/Woburn/Peabody] How often would you use Logan Express if it offered covered parking (a parking garage) at the [Q1.4e location] bus terminal?

- Less often than I do now About the same amount as I do now More often than I do now

f. [Q1.4 <> Logan Express] How likely would you be to use the Logan Express bus service for your travel to Logan Airport if it offered covered parking (a parking garage) at the bus terminal?

- Very unlikely Unlikely Likely Very likely Not sure/can't say

The comprehensive access mode and likely egress mode questions were revised to include more detail for TNC access modes (breaking out premium and shared services), transit (breaking out local MBTA bus and commuter rail), and “other” modes (breaking out walk and bike).

The question on parking facilities used was revised to adopt the wording used in the October 2018 survey, specifically adding detail distinguishing between travelers choosing Economy Parking and those directed there, as well as breaking out temporary (short-term) parking.

Two of the classification questions were also expanded to provide further detail. The gender question added choices for “Other/prefer to self-identify” and “Prefer not to say,” while the current

status question (employment status, retired, student, etc.) was expanded to describe the specific challenges of persons with disabilities, as follows:

b. Which of the following describe you (check all that apply)?

- I am a person with a disability
- I sometimes have trouble finding my way through the airport
- I sometimes have trouble remembering information about my flight
- I have visual challenges that sometimes make reading signs difficult
- I have auditory challenges that sometimes make hearing announcements difficult
- I sometimes require a wheelchair or other assistance in moving through the airport and/or boarding my flight
- None of the above

Questions on flight frequency from New England airports and membership in the PASSport parking program that had been included in 2016 were dropped from the 2019 questionnaire.

The use of electronic data collection for the 2019 survey also allowed the programming of validation parameters for the questionnaire. This feature was used to require responses to many of the questions, ensure valid responses for certain questions (e.g., the entry of a number in a numerical field), or to allow only one selection for certain multiple choice questions for which a single response was desired. Certain fields were also pre-populated with a list of suggested or valid answers (e.g., names of area hotels or transit stations) to speed response times and reduce the required amount of subsequent data cleaning. A copy of the 2019 questionnaire is provided in Appendix A.

Sample design

The sample was designed in a manner generally consistent with that of the previous surveys. The basic approach involves a two-stage sample with implicit stratification. At the first stage, all flights scheduled to depart from the airport on a survey day are sampled with probability proportional to their seating capacity, as the closest available proxy for their anticipated passenger loadings. At the second stage, the goal is to give a questionnaire to all adult (ages 18+) passengers who board a sampled flight, excluding only those connecting at the airport from other flights.

Implicit stratification involves taking steps to ensure that stratification variables are represented in the sample in proportion to their incidence in the parent population, rather than using different sampling fractions across the implicit strata. The choice of stratification variables reflects prior notions about their potential correlation with some aspect of ground-access behavior.

For the 2019 survey, the sample was implicitly stratified by departure time and flight distance, with flight distance defined as one of three categories: under 500 miles, 500-1,500 miles, and over 1,500 miles.⁴ In theory, flight distance (a rough proxy for total trip distance) may be associated with time spent away and hence with the amount of luggage carried per traveler.

⁴ The distance categories were chosen in the first instance simply to be consistent with prior surveys; originally we suspect the choice of categories likely was intended (lacking a more definitive or objective means to classify them) to roughly reflect the stage lengths of regional, medium distance, and transcontinental flights.

It should be noted that the stratification by flight distance is only a minor refinement, however, given that the current composition of flights at Logan is such that there is a significant correlation between flight distance and seating capacity (turboprops, regional jets, and large widebody aircraft all have very specific and nearly mutually exclusive operating ranges, for example). Under these circumstances, implicit stratification by distance will not cause flights to be selected in proportion to the overall mix of aircraft types at the airport (the goal of stratification), but rather, larger aircraft will be sampled disproportionately.

The oversampling of larger aircraft is already a result of our basic sampling method, and is corrected for at the weighting stage. A primary motivation for the inclusion of stratification by distance was to facilitate the substitution by the fieldwork crew of flights for those flights that were originally scheduled to be surveyed but were cancelled or significantly delayed (the organization of the sample in this manner allowed us to provide a more systematic method to the fieldworkers of selecting those substitute flights that maximized consistency with the overall sampling plan).

Selection of sample flights

For consistency with prior years, Massport specified a target of 8,000 completed surveys. Historically the sampling interval for the Air Passenger Survey has been based on response rates from the most recent prior survey along with the latest available information on load factors and average seating capacities of flights at the airport. However, as we had described in our earlier White Paper, and as actual data from the 2016 electronic survey pilot test and the 2018 Parking Study survey confirmed, the productivity of the survey conducted electronically was very likely to be lower than that observed with the prior pencil-and-paper method. This result stems from the fact that each fieldworker has only a limited number of tablets to distribute, and once a tablet is in use the fieldworkers must wait for a survey to be completed before passing the tablet onto another respondent.

For the 2019 survey therefore, the sampling interval was based not on the response rates from the 2016 survey, but rather on the actual experience of ground-access surveys conducted electronically with tablets at Logan. This experience is summarized in Table 1, which compares the response rate of the 2016 paper survey with the electronic survey pilot and the 2018 survey.

Table 1. Survey Productivity Comparison

Survey	Method	Completes per Flight	Comments
2016 Air Passenger Survey	Paper	43	
2016 APS Electronic Pilot Survey	Electronic	34–43	Tested different numbers of fieldworkers/tablets; tested distributing postcards to late arrivers
2018 Parking Freeze Study Survey	Electronic	~22	Only surveyed one person/travel party; used two fieldworkers per team, regardless of flight size; collected email addresses from late arrivers (no postcards)

Notes: 2016 APS Electronic Pilot survey figures reflect flights with two fieldworkers assigned.
 2018 Parking Freeze Survey figures reflect an achieved sample of ~5,000 usable completes.
 Average seats and passengers per flight are similar for each survey.

Based on this information, we assumed an expected net response rate of 0.235 usable responses per departing passenger for the 2019 survey. Using this metric we calculated that to achieve the target sample of 8,000 completed surveys it would be necessary to sample every 3,337th expected passenger (as determined by the number of seats on each departing flight and carrier-specific information on average load factors). This calculation is outlined below in Table 2.

Table 2. Calculation of Sampling Interval

Target sample size	8,000
<i>Divided by:</i> estimated useable questionnaires per expected passenger	0.235
Equals required expected passengers in sample	34,043
<i>Divided by:</i> average expected passengers per flight (from Schedule Data)	135.0
Equals required number of flights for sample	252
<i>Divided into:</i> total expected passengers during 2019 sample period	841,457
Equals: required sampling interval	3,337

A complete schedule of departing flights for each day of the 14-day survey period, as compiled by the Official Airline Guide (OAG), was supplied by Massport. These data also contained information on the total scheduled seats for each flight. This list of flights was sorted by distance category, then by departure time, and the total expected passengers cumulated. A random integer between 1 and 3,337 was chosen and the flight responsible for the expected passenger assigned that number in the cumulative list was chosen as the first flight in the sample. We then selected the flight responsible for every 3,337th expected passenger thereafter until the required 252 flights had been selected. This produced a systematic sample of flights reasonably equally spaced in departure time, with selection probability proportional to seating capacity.

Minor adjustments were subsequently made to the sample, generally to make the administration of the survey more logistically feasible and cost effective. As we will describe further, the final achieved sample also reflects substitutions that were necessarily made in the process of survey administration to account for flights that were delayed or cancelled. A complete list of the flights surveyed is provided in Appendix B.

Characteristics of the sample

Figure 1 shows the distribution of the final set of sampled flights by aircraft type. As described above, the sampling method results in larger aircraft having a higher probability of selection, and the figure reflects this result. While widebody aircraft represent 6% of departing flights at Logan, they comprise 13% of the sample. Conversely while regional jets and turboprops account for nearly 41% of total flights, together they make up only about 24% of the sample.

Figure 2 shows the distribution of sampled flights by terminal, indicating that about a third of them departed from Terminal B. Another third of the flights were located in Terminal C, and about 26% in Terminal A. This distribution is similar to that of the airport as a whole, but again reflects to some extent the fact that larger aircraft are more likely to be sampled. For example, the international flights that comprise the bulk of Terminal E operations typically use larger aircraft. Thus while Terminal E represents about 6% of total departures, it makes up 11% of the sample.

Figure 1. Distribution of Sample Flights by Aircraft Type

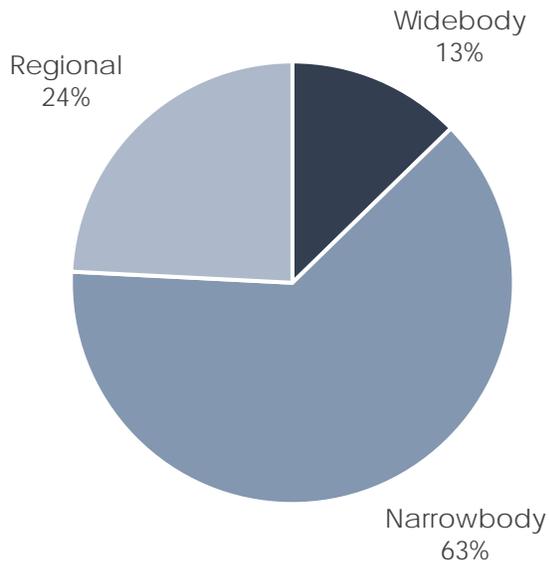
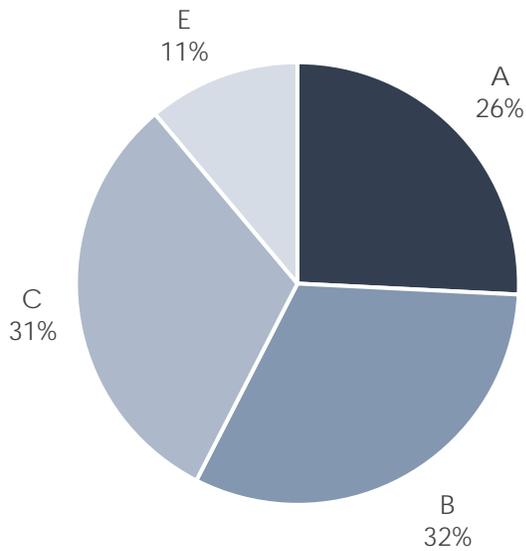
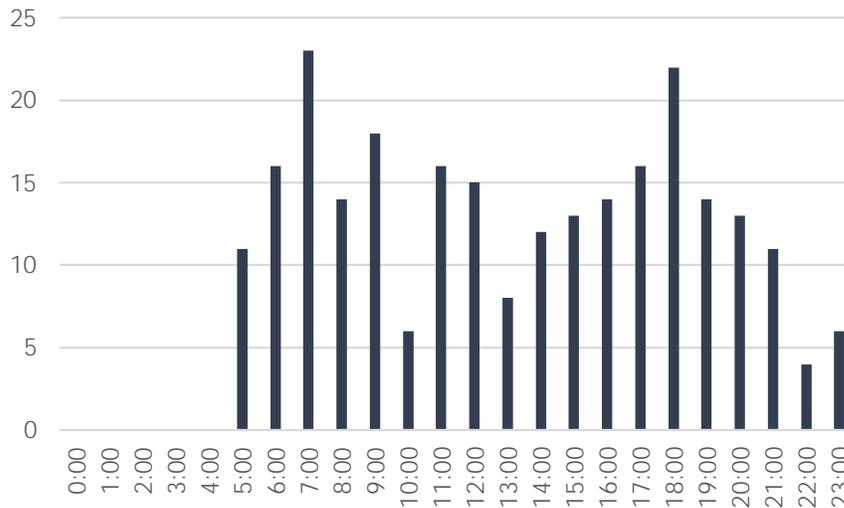


Figure 2. Distribution of Sample Flights by Terminal



The distribution of flights by departure time is shown in Figure 3. It indicates that generally busier periods also represent a higher proportion of flights in the sample. In addition, the very end of the day is predominantly characterized by commuter flights, and because of their lower seating capacity these flights are less likely to be selected for the sample.

Figure 3. Distribution of Sample Flights by Time of Day

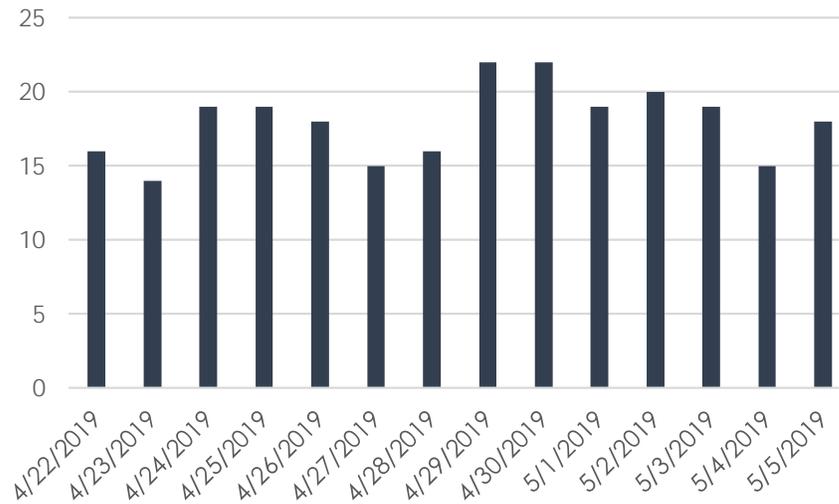


The number of flights sampled on each day of the survey period is shown in Figure 4. The figure shows that fewer flights were surveyed on Saturdays, reflecting the relatively lower number of total departures at the airport. It also reflects to some extent, however, the relative incidence of flights using larger aircraft across the days of the week,⁵ as well as (to some limited extent) the rearrangement of the survey schedule to make it more logistically feasible for the survey crew as described above.

As we will describe in more detail below, technical challenges on the first two days of the survey prevented the successful surveying of a small fraction of the sample flights, which were then re-surveyed in the second week. This is indicated in the figure by the relatively larger number of flights on April 29 and 30, compared with April 22 and 23.

⁵ For example, international flights that tend to use larger aircraft are more common on certain days, and business-oriented routes may use larger aircraft on weekdays vs. weekends, etc.

Figure 4. Survey Flights by Day



Survey execution

The survey was administered on each of the 14 days between Monday April 22 and Sunday May 5, 2019, and was conducted by fieldwork subcontractor Granite State Marketing Research, Inc. (GSMR).

Preparations for survey administration

A total of twenty-seven fieldworkers participated in the survey, including three supervisors. This was a larger number than in prior surveys due to the lower expected productivity of the electronic data collection as described above. All members of the fieldwork crew were fingerprinted and badged by the Massport Security Office in order to allow them access to the departure lounge areas for the purposes of conducting the survey.

All fieldworkers participated in a training session shortly before commencing work on the survey. The training familiarized the staff with the survey procedures, the geography of the airport, and the principal objectives of the survey. The fieldworkers were also given a written manual of instructions based on a standard text used in prior surveys and tailored to the specifics of the 2019 survey by GSMR.

Letters were sent by Massport to the airline station managers in advance of the survey notifying them of the survey dates and soliciting their cooperation. Emails were also sent to each of the station managers informing them which of their specific flights would be surveyed, and requesting that they solicit the cooperation of gate personnel in providing boarding count information to the survey crew. The letters also requested that the station managers inform us of any last minute schedule changes or other instances in which the data with which we had supplied them did not match their own internal flight information.

GSMR management developed a schedule for the fieldworkers in advance of the survey that indicated the specific personnel that were to be assigned to each sample flight. Massport

provided the GSMR survey crew with a central office location at the airport from which to coordinate all survey activities and store survey materials.

Survey process

The survey was carried out by GSMR using teams of fieldworkers according to the previously-prepared schedule described above. A GSMR supervisor was on hand at all times to coordinate each day's activities, and the individual survey teams each also included a lead interviewer to act as a supervisor. The process by which the survey was administered can be summarized as follows.

Survey personnel would arrive at the gate one and a half hours before the scheduled departure time of the flight (two hours for international flights), and would inform gate personnel of their presence and explain the protocol for the survey administration. They would also inform them that when the flight had finished boarding they would need to obtain final boarding count information. Each person waiting to board the flight would be screened according to a predetermined set of questions to determine their eligibility, and eligible passengers were given an electronic tablet on which to take the survey and asked to return it to the survey personnel when finished. These screening questions were printed on a Fieldworker Record Sheet, onto which fieldworkers would also record the number of passengers connecting from other flights or not meeting the age eligibility requirement (18 years). A copy of the Fieldworker Record Sheet is provided in Appendix C.

Late-arriving passengers were offered a postcard printed with instructions and a URL at which they could take survey online at some later time. In total about 4,500 postcards were printed, which proved to be more than sufficient for the purposes of the survey.

When boarding was completed, the supervising fieldworker would then request final boarding count information from the gate agent. Finally, the number of surveys completed and postcards distributed would be recorded on a Flight Summary Sheet, a copy of which is also provided in Appendix C.

In cases where flights were significantly delayed or cancelled, the survey supervisor was given the discretion to choose a replacement flight. A list of replacement flights was supplied to the supervisors in advance of start of the survey. Specifically, a list was provided for each day of the survey period. The day's list contained, for each flight scheduled to be surveyed that day, information for five alternate flights. This information included the carrier, flight number, departure time, destination, and the estimated size of the fieldwork crew required to survey the flight. The five flights shown on the list represented the next five flights departing from the same terminal and within the same flight distance category as the original survey flight. When flight substitutions were necessary, the supervisor was instructed to select the alternate flight that could most easily be surveyed (to minimize disruption to the rest of the survey schedule), while choosing a flight by the same airline as the original survey flight if possible.

Technical challenges

On the first two days of the survey (Monday April 22 and Tuesday April 23), the fieldwork team encountered significant technical issues in administering the survey. Many of the respondents on

early morning flights were unable to complete the survey as the electronic questionnaire would freeze or advance very slowly. In consultation with the online survey hosting vendor, the problem was ultimately traced to internal maintenance procedures performed on their servers during overnight hours (the servers are located in Texas, such that given the time zone difference these procedures occurred at the time the early morning flights were being surveyed).

Once the problem was identified, the vendor suspended these procedures for the remainder of the survey and the fieldwork team encountered no further issues. The flights that had been disrupted by the problem were re-surveyed on the same day of the second week of the survey. In total, 7 of the 252 sample flights were affected, but the survey was completed without impacting the integrity of the sampling plan.

Sample weighting

The survey responses need to be weighted for the purposes of the different analyses to be performed on the data. This is the case for several reasons:

1. *Basic sample design needs.* The general philosophy of the sample design is that flights are selected with probability proportional to equipment capacity, as the best available proxy for relative loadings. [If the sample selected flights with *equal* probability, it would be inefficient because it would involve a much larger number of “smaller” flights.] If there were perfect correlation between capacity and loadings (that is, if every flight had the same load factor), a “self-weighting” sample (that is, one not requiring any additional weighting) would be obtained by the random selection of an *equal* number of respondents per flight. But with the self-completion method the marginal costs of additional passengers per flight is much lower than the marginal costs of additional sample flights, so the most cost-effective (and logistically feasible) approach is to seek responses from *all* qualified passengers on the selected flight. This design, however, does “oversample” passengers on the “larger” flights, and weighting is necessary to correct for this.
2. *Varying load factors by flight.* The seating capacity of the plane is an imperfect proxy for the number of passengers, and weighting is also necessitated because of the variance in load factors.
3. *Varying response rates by flight.* The proportion of qualified departing passengers providing usable responses can vary across flights for a wide range of reasons. Weighting is required to reflect this variation in response rates.
4. *Inference of common behavior within travel parties.* The questionnaire asks respondents to indicate the size of their travel parties (defined as sharing a common vehicle for *both* air and ground-access travel), and also the number of travel party members filling out questionnaires. These estimates are used to infer aspects of the ground-access behavior for non-responding members of the travel party. Hence, we develop a separate weight for the responses to ground-access behavior questions from that used (for the same respondent) for such non-inferable characteristics as age, sex, income, etc.

The weights were calculated as described in more detail in the following sections.

Step 1: Correct for travel party size effects

The calculation of the first stage weight varies depending on whether or not the ground-access variable of interest is expected to be identical across all members of a travel party.

Let A_{ij} and C_{ij} be (respectively) the numbers of adults and children in the travel party reported by the j^{th} respondent on flight i . Let R_{ij} be the reported total number of *respondents* from this travel party. Then for those ground-access variables that are expected to be identical for all travel party members, the first stage weight was computed as:

$$W_{1ij} = \frac{A_{ij}}{R_{ij}}$$

For all other variables that are not inferable from knowledge of the travel party composition,

$$W_{1ij} = 1$$

Step 2: Weight the responses to reflect total ground-access passengers for each sample flight

From the information gathered from the lead gate agent after the flight has closed, let b_i be the number of originating (that is, not connecting) passengers on flight i . The second stage weight was computed as

$$W_{2ij} = \frac{b_i}{\sum_j W_{1ij}}$$

Step 3: Weight each flight by the inverse of its selection probability

Consider distance category k . Let S_i be the number of seats attributed to flight i , and let n_k be the number of flights sampled in distance category k . The third stage weight was computed as

$$W_{3i} = \frac{\sum_{ik} S_i}{n_k S_i}$$

Step 4: Final computation of weights

The final weights for each response were computed as the product of each of the weights described above, as follows:

$$W_{ij} = W_{1ij} * W_{2i} * W_{3i}$$

The choice of weights for further analysis of the data

As described above, the calculation of the first stage weight (w_1 , above) varies depending on whether or not the ground-access variable of interest is expected to be identical across all members of a travel party. Since the weights need to be used in the analysis of all of the ground-access variables measured with the survey, we have therefore computed two separate weights for each survey response:

- *Weight A* is used for variables describing travel patterns that are (by definition of what constitutes a “travel party”) the same for all members of the travel party. Examples are details of the ground-access trip (origin, mode, etc.) and details of today’s air trip (flight, destination airport, etc.). This weight imputes to the whole travel party the responses received from any members thereof, and uses the first definition of w_1 shown above.
- *Weight B* is used for variables describing aspects that are *not* necessarily the same for all members of the same travel party. Examples include personal characteristics (sex, household income, etc.) and details of the corresponding inbound flight. This weight is calculated using the latter definition of w_1 , in which w_1 is assumed to equal 1.

Creation of final survey database

Table 3 provides a summary of how the final survey database was created. It shows that 8,820 respondents participated in the survey and provided complete responses. Of these, 257 were discarded due to non-matching flight numbers (their responses could not be matched to survey flights). Another 352 responses were added to the sample from partially completed responses deemed useable. Finally, 152 responses were discarded during data cleaning, resulting in a total final achieved sample of 8,763 responses. The table also shows that, consistent with prior surveys, the vast majority of these responses (98%) were completed at the airport rather than online at a later time using the URL supplied on the postcards.

Table 3. Final Achieved Sample

Initial completes		8,820
less Responses discarded due to unmatchable flight numbers		- 257
plus Useable partially complete responses		+ 352
less Responses discarded during data cleaning		- 152
Total achieved sample		8,763
<hr/>		
Tablets	8,623	98%
Postcards	140	2%
Total achieved sample	8,763	100%

The final achieved sample of 8,763 responses equates to 35 completes per flight, which is similar to the level of productivity achieved in the 2016 pilot electronic survey test and somewhat higher than that achieved in the 2018 survey. In general this result validates our assumptions used in the sampling plan to determine the number of survey flights, and will be an important benchmark upon which to base the sampling plan for future surveys.

Within a week of the end of the survey, a database of the raw responses was supplied by the online survey hosting vendor Symmetric Sampling. We then performed additional error checking, cleaning, and recoding of the responses as needed. This work included standardizing the responses to free-response (“write-in”) questions, and correcting inconsistent responses. Examples of the latter might include situations where the respondent had indicated other scheduled express bus as their access mode but then indicated Logan Express as the name of the service, or failed to include themselves in recording their travel party size. The results of the analysis of the survey responses are described in the following chapter.

3. SUMMARY OF RESULTS

This chapter provides a summary comparison of key results with the prior three surveys, conducted respectively in 2010, 2013, and 2016. Respondents who indicated that Logan Airport was at the "home" end of their air trip were classified as residents, and respondents who indicated that their air travel was primarily part of a business trip were classified as business passengers.

Table 4 compares the share of weekday passengers by market segment across the four surveys. Resident non-business continues to be the largest market segment, and has fallen slightly since 2016 to 42.5% of total passengers. The resident business share has increased since the 2016 survey, while the two non-resident segments have decreased slightly. Overall, the business share of weekday passengers has increased slightly from 38.1% in 2016 to 39.6% in 2019.

Table 4. Distribution of Logan Ground-Access Passengers by Market Segment (Weekday Trips): 2010-2019

Market Segment	2010	2013	2016	2019
Resident Business	21.0%	18.6%	18.1%	21.3%
Resident Non-Business	33.6%	40.9%	43.4%	42.4%
Non-Resident Business	19.5%	23.8%	20.0%	18.3%
Non-Resident Non-Business	25.8%	16.8%	18.5%	18.0%
<i>Subtotal – Resident</i>	<i>54.6%</i>	<i>59.5%</i>	<i>61.5%</i>	<i>63.7%</i>
<i>Subtotal – Non-Resident</i>	<i>45.3%</i>	<i>40.6%</i>	<i>38.5%</i>	<i>36.3%</i>
<i>Subtotal – Business</i>	<i>40.5%</i>	<i>42.4%</i>	<i>38.1%</i>	<i>39.6%</i>
<i>Subtotal – Non-Business</i>	<i>59.4%</i>	<i>57.7%</i>	<i>61.9%</i>	<i>60.4%</i>
TOTAL	100.0%	100.0%	100.0%	100.0%

Tables 5 and 6 compare the shares of survey respondents by gender and age, respectively. About 51% of passengers are female in 2019, up slightly from 50% in 2016. In general, the nearly equal shares by gender have remained largely consistent since 2010. The age distribution of passengers is likewise generally quite consistent with the previous surveys, with all age categories remaining within about one percentage point of the shares observed in 2016.

Table 5. Distribution of Logan Ground-Access Passengers by Gender (All Trips): 2010-2019

Gender	2010	2013	2016	2019
Female	50%	51%	50%	50.8%
Male	50%	49%	50%	48.7%
Other/prefer to self-identify	*	*	*	0.5%
TOTAL	100.0%	100.0%	100.0%	100.0%

*The gender question included only Female and Male categories prior to 2019.

Table 6. Distribution of Logan Ground-Access Passengers by Age (All Trips): 2010-2019

Age	2010	2013	2016	2019
Under 25	10%	8%	11%	9.9%
25-34	22%	22%	24%	25.1%
35-44	17%	18%	16%	16.8%
45-54	22%	21%	20%	19.0%
55-64	19%	19%	17%	17.5%
65 and over	10%	12%	12%	11.7%
TOTAL	100.0%	100.0%	100.0%	100.0%

Table 7 compares the primary access mode shares with those from the three previous surveys. Most notable is the more than doubling of the App Ride/TNC share to nearly 30% of all ground-access trips from its 2016 level of 14.3%. This continued rapid growth has evidently drawn share from other modes, with Taxicab continuing the steep decline observed between 2013 and 2016, and a more modest decline in Private Vehicle share, most notably in the Dropped Off category. The net effect of these changes is an increase in overall share of automobile modes⁶ from 69.5% in 2016 to 76.2% in 2019.

TNC growth has evidently also captured share from HOV/transit modes. Logan Express market share has fallen back to its historical mode share, reversing the gain seen in 2016 with the advent of the Back Bay service.⁷ The table also shows significant declines in the use of MBTA services providing ground-access directly to the airport, with the Blue Line losing more than half its market share since 2016, and the Silver Line experiencing almost as large a decline from 3.3% to 1.8% of trips. Some of this decline can be attributed to the inclusion of the MBTA commuter rail mode option in the 2019 survey, as it is likely that respondents taking commuter rail in previous surveys self-classified as Silver Line riders. Nonetheless, the 0.7% share of commuter rail makes up only a small share of the overall MBTA mode share decline. The growth of TNCs appears to have captured share from other modes as well, with car service/other shared ride van or limo also evidencing a notable decline since 2016.

⁶ This classification corresponds to Massport's previous definition of SOV. Some vehicles previously classified as HOV, including "Car service or other shared-ride van/limo" are also in fact automobiles, a point of confusion that will be clarified by the new occupancy-based HOV definition for for-hire commercial ride hail modes.

⁷ Logan Express survey mode shares between 2013, 2016, and 2019 are challenging to compare due to the timing of changes in policies and the administration of the triennial surveys. The Logan Express Back Bay service, initiated in 2014, was intended as a short-term and heavily subsidized Massport pilot program for the purpose of supplementing MBTA subway service during the reconstruction of the Blue/Green Line Government Center Station. The pilot was continued after the completion of construction at Government Center Station in March 2016 but with a higher fare structure beginning in June of that year, which corresponded with sharp ridership declines on the Back Bay service immediately after the 2016 survey. Beginning on May 1, 2019, towards the end of the 2019 survey period, Massport began heavily discounting inbound to Logan pricing, offering priority in security line privileges to all riders, and realigning the service to stop at the MBTA Back Bay Orange Line/Commuter Rail Station. These latter changes can be expected to have a positive effect on Back Bay service ridership but their impact is likely not reflected in the 2019 survey results.

Table 7. Distribution of Ground-Access Passengers by Access Mode (All Trips): 2010 - 2019

Access Mode		2010	2013	2016	2019
Automobile	Private vehicle – Dropped off	27.0%	28.0%	21.3%	18.9%
	Private vehicle – Parked at Airport (short term)*	*	*	*	2.3%
	Private vehicle – Parked at Airport (other)*	12.2%	12.5%	11.4%	9.3%
	Private vehicle – Parked off Airport	1.1%	2.6%	1.8%	1.5%
	Rental vehicle	10.9%	10.4%	10.9%	10.7%
	Taxicab	18.8%	18.6%	9.8%	3.9%
	App ride/TNC	**	**	14.3%	29.5%
Subtotal		70.0%	72.1%	69.5%	76.2%
HOV/Transit	Logan Express – Back Bay	**	**	0.5%	0.5%
	Logan Express – Other	4.0%	3.9%	4.6%	3.3%
	Other scheduled express bus	3.7%	2.9%	4.5%	4.5%
	MBTA Blue Line	4.0%	2.7%	3.1%	1.5%
	MBTA Silver Line	3.1%	4.7%	3.3%	1.8%
	MBTA other bus	***	***	***	0.0%
	MBTA commuter rail	***	***	***	0.7%
	MBTA water ferry/ water taxi	0.3%	0.2%	0.2%	0.1%
Subtotal		15.1%	14.4%	16.3%	12.5%
Other	Car service or other shared ride van/limo	8.2%	8.3%	8.1%	5.3%
	Free hotel/other shuttle	4.4%	3.3%	3.3%	2.6%
	Charter/group tour bus	1.3%	1.3%	1.5%	2.6%
	Other (walk, bike, & other not shown above)	1.1%	0.4%	1.1%	0.9%
	Subtotal		15.0%	13.3%	14.0%
TOTAL		100.0%	100.0%	100.0%	100.0%

*Parked at airport short term not individually measured prior to 2019 (previously included in Private Vehicle). Reflects passengers arriving in private vehicles temporarily parked at a terminal garage or lot and then driven away. All others parking private vehicles at the airport are reflected under "Parked at Airport (other)."

**App ride/TNC and Back Bay Logan Express service began after the 2013 survey.

***MBTA other bus and MBTA commuter rail mode shares were not individually measured prior to the 2019 survey.

Table 8 compares the geographic distribution of airport access trip origins over the previous four surveys. The distribution of trip origins has remained relatively consistent, and shows very little change since 2016. The share of trip origins outside of I-495 had been growing since 2010, but that growth now appears to have leveled off at around 28% of passengers. This prior increase may have been due in part to Low-Cost Carrier growth at Logan and the availability of more flight

options generally, which likely attracted some passengers that would have otherwise traveled to/from Manchester and Providence.

Table 8. Distribution of Ground-Access Passengers by Origin Zone (All Trips): 2010 - 2019

Origin Zone	2010	2013	2016	2019
Inside Route 128	52%	55%	52%	52.0%
Between Route 128 and I-495	25%	21%	20%	20.1%
Outside I-495	23%	24%	28%	27.8%
TOTAL	100.0%	100.0%	100.0%	100.0%

4. DETAILED RESULTS FOR 2019

Overview

This chapter summarizes the detailed results for the 2019 survey. Results are shown separately in most cases for weekday, weekend, and all trips. We first provide a profile of the passengers responding to the survey, and then describe the characteristics of these travelers in terms of their mode choices and other characteristics of their ground-access trips.

Profile of passengers

In total 37% of ground-access passengers using Logan in 2019 are traveling for business purposes. On weekdays the share is slightly higher at about 40%. Overall, about 62% of ground-access passengers are residents of the Boston area, with the weekday share again being slightly higher at about 64%. Table 9 shows the distribution of passengers by market segment, a combination of trip purpose (business or non-business) and resident/non-resident status. Resident non-business is by far the largest market segment, indicating the significant amount of leisure travel to be expected from the local population of a highly affluent, major metropolitan area. As might be expected, during the weekends non-resident non-business travelers are a much higher proportion of passengers than on weekdays, reflecting the significant numbers of tourists that visit the Boston area.

Table 9. Distribution of Logan Ground-Access Passengers by Market Segment: 2019

Market Segment	Weekday	Weekend	All Trips
Resident Business	21.3%	17.2%	20.2%
Resident Non-Business	42.4%	39.7%	41.7%
Non-Resident Business	18.3%	11.1%	16.5%
Non-Resident Non-Business	18.0%	32.0%	21.6%
<i>Subtotal – Resident</i>	<i>63.7%</i>	<i>56.9%</i>	<i>62.0%</i>
<i>Subtotal – Non-Resident</i>	<i>36.3%</i>	<i>43.1%</i>	<i>38.0%</i>
<i>Subtotal – Business</i>	<i>39.6%</i>	<i>28.4%</i>	<i>36.7%</i>
<i>Subtotal – Non-Business</i>	<i>60.4%</i>	<i>71.6%</i>	<i>63.3%</i>
TOTAL	100.0%	100.0%	100.0%

Figure 5 summarizes the origins of ground-access trips to Logan in 2019, indicating that over half of the passengers, or 52%, come from locations within Route 128. Over a quarter of all passengers (27%), however, come from areas outside of I-495.

Figure 5. Distribution of Ground-Access Passengers by Origin

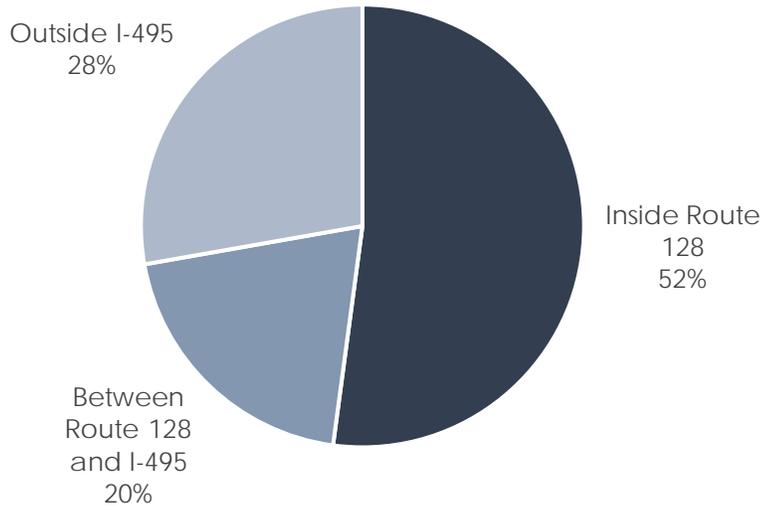


Figure 6 provides a more detailed spatial representation of the origin area distribution, using the weighted responses scaled to represent total weekday ground-access trips. It shows that the highest concentrations of trips originate in Boston proper and other areas with higher densities of population or industry (such as Cambridge, Brookline, Waltham, Woburn, or Framingham).

Figure 6. Ground-Access Passengers by Origin Zone

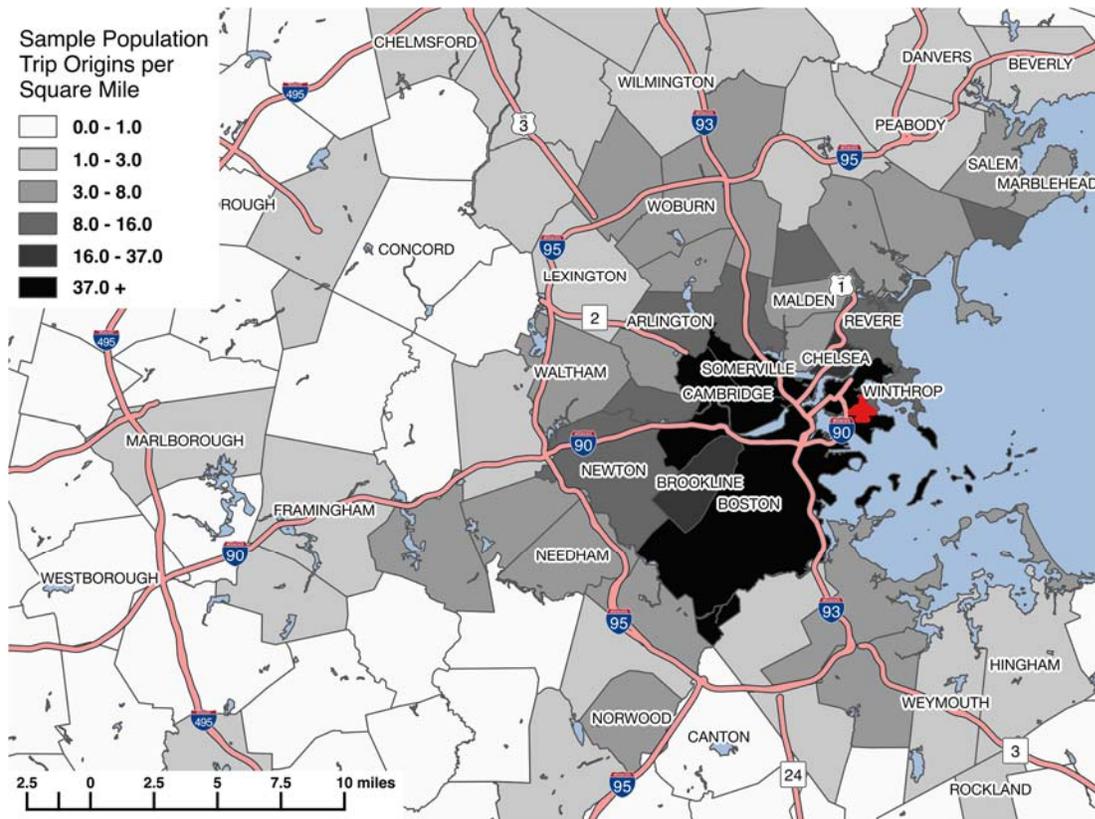


Table 10 combines the market segment and origin area information shown above, and indicates that in general, business trips tend to constitute a relatively higher share of trips originating inside of I-495, consistent with the concentration of business closer to the central city. Trips by residents are significantly higher as a percentage than trips by non-residents for the area between Route 128 and I-495, reflecting the significant number of suburban residential communities in this area. Similarly, the single highest share of trips originating outside I-495 is for resident non-business trips, consistent with the relatively lower density of both businesses and tourist attractions at this distance from Boston.

Table 10. Distribution of Ground-Access Passengers by Origin Zone and Market Segment (All Trips): 2019

Origin Zone	Urban Core	Between Urban Core & Route 128	Between Route 128 and I-495	Outside I-495, within MA	Outside MA
Resident Business	16.1%	22.9%	25.5%	23.5%	18.1%
Resident Non-Business	30.1%	44.8%	47.1%	50.7%	53.0%
Non-Resident Business	25.7%	13.7%	12.1%	7.5%	8.9%
Non-Resident Non-Business	28.1%	18.6%	15.3%	18.4%	20.0%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

Tables 11 and 12 provide further detail specifically for weekday and weekend trips, respectively. These tables show that all market segments other than non-resident non-business market segment have a larger share of trips originating in the urban core on weekdays vs. weekends. This result is consistent with the generally higher concentration of business trips during the week, as well as the likely concentration of tourist visits in the urban core on weekends.

Table 11. Distribution of Ground-Access Passengers by Origin Zone and Market Segment (Weekday Trips): 2019

Origin Zone	Urban Core	Between Urban Core & Route 128	Between Route 128 and I-495	Outside I-495, within MA	Outside MA
Resident Business	17.5%	24.3%	26.6%	22.9%	19.1%
Resident Non-Business	31.2%	44.8%	47.5%	51.9%	54.5%
Non-Resident Business	27.8%	16.2%	14.0%	8.9%	8.8%
Non-Resident Non-Business	23.5%	14.7%	11.9%	16.2%	17.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

Table 12. Distribution of Ground-Access Passengers by Origin Zone and Market Segment (Weekend Trips): 2019

Origin Zone	Urban Core	Between Urban Core & Route 128	Between Route 128 and I-495	Outside I-495, within MA	Outside MA
Resident Business	11.6%	19.1%	22.3%	24.6%	15.3%
Resident Non-Business	26.9%	44.8%	45.6%	47.9%	49.1%
Non-Resident Business	19.3%	6.5%	6.1%	4.2%	9.2%
Non-Resident Non-Business	42.2%	29.6%	26.0%	23.3%	26.4%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

About 49% of all ground-access passengers are male in 2019, though these percentages are considerably higher among the business trip market segments, as shown in Table 13. The table shows that men make up 62% of resident ground-access business passengers and 63% of non-resident business travelers.

Table 13. Gender Distribution of Logan Ground-Access Passengers by Market Segment (All Trips): 2019

Gender	Resident Business	Resident Non-Business	Non-Resident Business	Non-Resident Non-Business
Female	37.8%	58.9%	36.9%	58.0%
Male	61.6%	40.6%	62.8%	41.6%
Other/prefer to self-identify	0.6%	0.5%	0.3%	0.4%
TOTAL	100.0%	100.0%	100.0%	100.0%

The incomes of ground-access passengers at Logan are considerably higher than that of the region as a whole. Table 14 shows that over two thirds (68%) of the respondents who answered the income question on the survey indicated an annual household income of \$90,000 or more, and over half (54%) have an annual household income of \$120,000 or more. By comparison, according to the Census Bureau, only 44% of households in the Boston Consolidated Metropolitan Statistical Area have household incomes of \$100,000 or more.⁸ This result is consistent with the fact that air travelers are generally observed to have higher-than-average incomes, and that the incidence of travel is also positively correlated with income (other things being equal, very frequent air travelers are more likely to be sampled in the survey).

⁸ U.S. Census Bureau (2017), American Community Survey, 1-Year Estimates.

Table 14. Household Income Distribution of Logan Ground-Access Passengers by Day Type: 2019

Household Income	Weekday	Weekend	All Trips
Under \$30,000	6.3%	7.0%	6.5%
\$30,000 to under \$60,000	11.4%	11.8%	11.5%
\$60,000 to under \$90,000	13.9%	13.3%	13.7%
\$90,000 to under \$120,000	14.5%	15.3%	14.7%
\$120,000 to under \$150,000	11.5%	12.7%	11.8%
\$150,000 to under \$180,000	8.5%	9.4%	8.7%
\$180,000 to under \$200,000	6.7%	6.4%	6.6%
\$200,000 to under \$350,000	15.5%	14.5%	15.3%
\$350,000 to under \$500,000	5.9%	4.2%	5.5%
\$500,000 or more	5.8%	5.4%	5.7%
TOTAL	100.0%	100.0%	100.0%

Table 15 provides further detail on the household income distribution of ground-access passengers by market segment. The table shows that the lowest incomes are found among non-business travelers (the segment that includes students), while the highest income levels are most prevalent among business travelers.

Table 15. Household Income Distribution of Logan Ground-Access Passengers by Market Segment (All Trips): 2019

Household Income	Resident Business	Resident Non-Business	Non-Resident Business	Non-Resident Non-Business
Under \$30,000	2.4%	8.7%	1.5%	10.9%
\$30,000 to under \$60,000	6.7%	13.6%	8.1%	15.3%
\$60,000 to under \$90,000	9.7%	16.2%	11.8%	14.7%
\$90,000 to under \$120,000	12.4%	17.7%	11.0%	14.4%
\$120,000 to under \$150,000	12.6%	11.7%	13.3%	9.8%
\$150,000 to under \$180,000	11.8%	7.5%	8.2%	8.5%
\$180,000 to under \$200,000	8.8%	6.0%	8.7%	3.8%
\$200,000 to under \$350,000	21.4%	12.4%	20.0%	10.4%
\$350,000 to under \$500,000	7.4%	3.0%	9.4%	4.9%
\$500,000 or more	6.9%	3.3%	8.0%	7.3%
TOTAL	100.0%	100.0%	100.0%	100.0%

Ground-access mode

Table 16 presents the distribution of ground-access modes. The table shows that private vehicle represents the most common mode, representing about 32% of all ground-access trips. However, App Ride/TNC trips now comprise 29.5% of all ground-access trips, and over 30% of weekday trips.

Table 16. Distribution of Ground-Access Trips by Mode: 2019

	Access Mode	Weekday	Weekend	All Days
Automobile	Private vehicle – <i>Dropped Off</i>	16.8%	24.6%	18.9%
	– <i>Temporarily parked at terminal</i>	2.5%	1.6%	2.3%
	– <i>Parked at terminal</i>	8.1%	5.2%	7.3%
	– <i>Parked in Economy by choice</i>	1.8%	1.1%	1.7%
	– <i>Parked in Economy not by choice</i>	0.3%	0.1%	0.3%
	– <i>Parked in overflow lot</i>	0.1%	0.1%	0.1%
	– <i>Parked off-Airport</i>	1.6%	1.2%	1.5%
	Rental vehicle	9.9%	13.0%	10.7%
	Taxicab	4.1%	3.4%	3.9%
	Regular app ride	24.0%	20.9%	23.2%
Premium app ride	1.8%	2.3%	1.9%	
Shared app ride	4.6%	3.7%	4.4%	
	<i>Subtotal</i>	75.8%	77.4%	76.2%
HOV/Transit	Logan Express - Back Bay	0.6%	0.3%	0.5%
	Logan Express – Other	3.6%	2.6%	3.3%
	Other scheduled express bus	4.7%	3.9%	4.5%
	MBTA Blue Line	1.5%	1.4%	1.5%
	MBTA Silver Line	2.1%	1.0%	1.8%
	MBTA Other bus	0.0%	0.0%	0.0%
	MBTA commuter rail	0.8%	0.3%	0.7%
	MBTA water ferry	0.1%	0.0%	0.1%
	Water taxi	0.1%	0.0%	0.1%
	<i>Subtotal</i>	13.6%	9.5%	12.5%
Other	Car service	4.5%	3.3%	4.2%
	Other shared ride van/limo	1.1%	1.0%	1.1%
	Free hotel/other shuttle	2.4%	3.2%	2.6%
	Charter/group tour bus	1.7%	5.0%	2.6%
	Walk	0.8%	0.6%	0.7%
	Bike	0.0%	0.1%	0.0%
	Other	0.2%	0.0%	0.1%
		<i>Subtotal</i>	10.7%	13.2%
	TOTAL	100.0%	100.0%	100.0%

The table shows that shared app ride (UberPool, Lyft Line) now represent 4.4% of total trips, making this subsegment alone larger than taxi, which has fallen to 3.9% overall. This result may reflect the fact that as TNC share has grown generally, the attractiveness of shared TNC rides may increase commensurately, and/or the further experience/confidence with shared app ride services that passengers have gained over the last few years.⁹ Rental vehicles have about 11% market share, such that taken together, automobile modes comprise about 76% of ground-access trips to Logan in 2019 (and about 80% if limo car service is included).

HOV/Transit modes represent 12.5% of ground-access trips in 2019, with this share being split roughly evenly among Logan Express, other express bus, and MBTA services. Logan Express and other express bus services represent 3.9% and 4.5% of total trips, respectively, while the individual MBTA services each represent about 2% or less of total trips. The Silver Line on weekdays captures the largest share among these modes at 2.1%.

Table 17 presents the average occupancy and percentage of passengers arriving in single occupant vehicles for each applicable mode. As expected, average occupancy is generally lower for the automobile modes, while the percentage of passengers arriving in SOVs is highest for these modes. Among the automobile modes, however, average occupancy is slightly higher for private vehicles than taxis and app ride, but lower than rental cars. Occupancy is highest for other shared ride van/limo at 3.51 persons per respondent-trip. Single occupant trips are correspondingly lowest for other shared ride van/limo, at around 12% of total. The overall average occupancy and percent SOV passengers closely mirror that of the automobile modes, reflecting their relatively high share of airport ground-access trips.

Table 17. Average Vehicle Occupancy for Selected Ground-Access Modes: 2019

	Mode	Average Vehicle Occupancy	% Single Occupancy
Automobile	Private Vehicle	2.26	16.7%
	Rental Vehicle	2.05	26.1%
	Taxicab	1.63	44.0%
	Regular app ride	1.48	47.8%
	Premium app ride	2.01	29.9%
	Shared app ride	1.48	51.7%
	Subtotal	1.84	31.3%
HOV/Shared Ride	Car service	1.97	26.9%
	Other shared ride van/limo	3.51	11.6%
	Subtotal	2.20	23.8%
TOTAL		1.87	30.8%

⁹ Other things equal, the greater the density of TNC trips, the greater the likelihood that a shared TNC trip with a nearby pickup point and a common destination (the Airport) will be available. The availability of such shared trips will reduce both total trip time and uncertainty, thereby increasing the perceived value of a shared trip. The observed share may also reflect some respondent misunderstanding of the options shown on the questionnaire (e.g. confusing “shared” with the “ridesharing” moniker often ascribed to TNC services generally, etc.).

Table 18 shows the distribution of travel party size by market segment, indicating that the vast majority of business passengers are traveling alone, with large travel parties being correspondingly much more common among non-business passengers. In general, over 80% of passengers in all market segments are traveling in parties of two or fewer.

Table 18. Travel Party Size Distribution of Logan Ground-Access Passengers by Market Segment (All Trips): 2019

Travel Party Size	Resident Business	Resident Non-Business	Non-Resident Business	Non-Resident Non-Business	TOTAL
1	84.7%	43.1%	72.6%	47.7%	57.4%
2	10.7%	38.7%	18.0%	34.2%	28.6%
3	1.7%	7.6%	5.3%	9.6%	6.5%
4	0.6%	5.2%	2.1%	4.5%	3.6%
5	0.7%	2.0%	0.4%	2.6%	1.6%
6 – 10	0.8%	2.1%	0.9%	0.8%	1.3%
11 – 15	0.6%	0.3%	0.3%	0.0%	0.3%
More than 15	0.2%	0.9%	0.5%	0.5%	0.6%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

Private vehicle access and parking

Those passengers using private vehicles to access the airport are most likely to be dropped off, particularly on the weekends, as shown in Table 19. Overall 59% of passengers arriving by private vehicle did not park a car, compared to 62% in 2016. As described in Chapter 1, the 2019 survey modified this question to allow us to observe further detail about parking choices. The table shows that about 7% of passengers parked only temporarily at a terminal, while slightly less than 1% were required to park in economy despite that product not being their first choice, presumably because other options were not available.

Table 19. Parking Status Distribution of Private Vehicle Ground-Access Passengers: 2019

Parking Status	Weekday	Weekend	All Days
Dropped off	53.8%	72.5%	59.0%
Temporarily parked at terminal	7.9%	4.8%	7.1%
Parked at terminal	25.8%	15.2%	22.9%
Parked in economy lot by choice	5.9%	3.3%	5.2%
Parked in economy lot not by choice	1.0%	0.4%	0.8%
Parked in overflow lot	0.3%	0.2%	0.3%
Parked off airport	5.2%	3.5%	4.8%
TOTAL	100.0%	100.0%	100.0%

Further detail is provided in Table 20, which breaks out these results by market segment. Not surprisingly, drop-off, temporary, and off-airport parking were highest among resident non-business travelers, while parking at a terminal was dominated by the resident business segment. Non-residents arriving by private vehicle were overwhelmingly dropped off.

Table 20. Parking Status Distribution of Private Vehicle Ground-Access Passengers by Market Segment: 2019

Parking Status	Resident Business	Resident Non-Business	Non-Resident Business	Non-Resident Non-Business	TOTAL
Dropped off	29.1%	65.3%	90.8%	88.3%	59.7%
Temporarily parked at terminal	5.4%	7.6%	1.7%	9.6%	7.2%
Parked at terminal	52.3%	14.2%	1.3%	0.2%	22.2%
Parked in economy lot by choice	6.5%	5.7%	3.9%	1.1%	5.1%
Parked in economy lot not by choice	1.8%	0.5%	1.2%	0.1%	0.8%
Parked in overflow lot	0.9%	0.1%	0.0%	0.2%	0.3%
Parked off airport	4.1%	6.5%	1.0%	0.4%	4.7%
TOTAL	100.0%	100.0%	100.0%	100.0%	100.0%

Parking duration is presented in Table 21, which shows that the largest single share of passengers parked for three or four days. Parking duration is lower on average on weekdays, likely reflecting the higher proportion of business travelers that in turn tend to have short trip durations.

Table 21. Parking Duration Distribution of Private Vehicle Ground-Access Passengers: 2019

Parking Duration	Weekday	Weekend	All Days
4 hours or less	3.5%	5.8%	4.0%
4 to 24 hours	15.0%	12.4%	14.5%
1 or 2 days	18.1%	13.1%	17.2%
3 or 4 days	40.6%	24.6%	37.6%
5 or 6 days	15.7%	24.6%	17.4%
7 days or more	7.0%	19.5%	9.4%
TOTAL	100.0%	100.0%	100.0%

HOV share

In prior surveys HOV share was computed as the share of ground-access trips made by public transit or on other shared ride modes (including car service, shared ride van or limo, courtesy

shuttle, charter bus, or water taxi). Under the new definition adopted by Massport in 2018, HOV ground-access share now includes trips made by public transit or shared ride modes (including shared ride van or limo, courtesy shuttle, charter bus, or water taxi), as well as trips made by taxi, TNC, or car service where vehicle occupancy is larger than one. The share of weekday ground-access trips made by High Occupancy Vehicles (HOV) was 40.5% in 2019, under this new definition, as shown in Table 22.

Table 22. HOV Share of Ground-Access Passengers: 2019

Method	Weekday	Weekend	All Days
HOV Share - prior method	24.2%	22.6%	23.8%
HOV Share - new method	40.5%	40.6%	40.5%

Table 23 provides a further breakdown of HOV share by market segment. The table shows that HOV share is highest among resident non-business passengers at 43.5%. The table also shows that resident business passengers have the lowest share of any market segment, but even in this case the HOV share is 19.8%.

Table 23. HOV Share of Ground-Access Passengers by Market Segment: 2019

Method	HOV Share - prior method	HOV Share - new method
Resident Business	17.2%	19.8%
Resident Non-Business	29.5%	43.5%
Non-Resident Business	15.2%	30.1%
Non-Resident Non-Business	21.0%	40.8%
<i>Subtotal – Resident</i>	<i>25.5%</i>	<i>35.7%</i>
<i>Subtotal – Non-Resident</i>	<i>18.5%</i>	<i>36.2%</i>
<i>Subtotal – Business</i>	<i>16.3%</i>	<i>24.4%</i>
<i>Subtotal – Non-Business</i>	<i>26.6%</i>	<i>42.6%</i>

Logan Express

Table 24 summarizes the distribution of Logan Express ground-access trips by facility. It shows that Framingham captures the largest share of trips at 39%, followed by Braintree at about 31%. The 2019 survey shows the Back Bay service as representing 13.2% of Logan Express trips to Logan, roughly comparable to Woburn at 12.8%. However, as we have described above, the 2019 survey results likely do not reflect fare reductions and service improvements implemented near the end of the survey period. These changes can be expected to have a positive effect on Back Bay Logan Express ridership, and their impact is likely not reflected in the 2019 survey results.

Table 24. Distribution of Logan Express Riders (Excluding Employees) by Service: 2019

Terminal	Weekday	Weekend	All Days
Back Bay	14.2%	8.9%	13.2%
Braintree	32.1%	28.4%	31.4%
Framingham	37.3%	46.3%	39.0%
Woburn	13.5%	9.9%	12.8%
Peabody	2.9%	6.4%	3.5%
TOTAL	100.0%	100.0%	100.0%

The 2019 survey added three questions to measure interest in new or proposed Logan Express service features. Figure 7 shows that 44% of respondents said they'd be likely or very likely to use Logan Express if it allowed them, at no additional cost, to skip to the head of the security line once arriving at the airport ("head of the line" privileges).

Figure 7. Likelihood of Using Logan Express if it Offered Head of Line Privileges

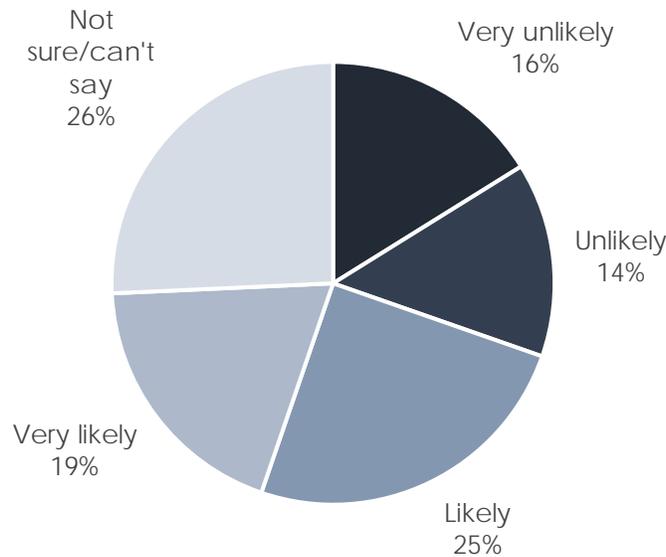
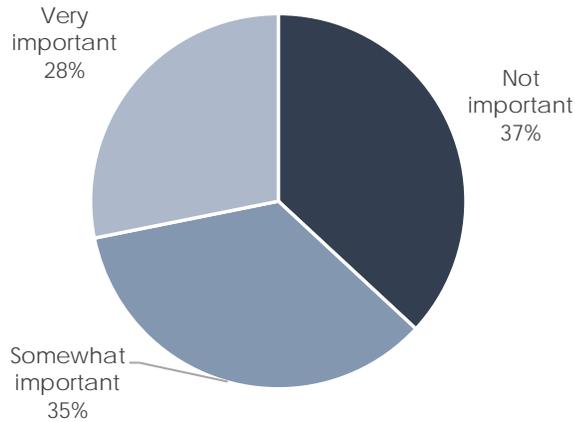


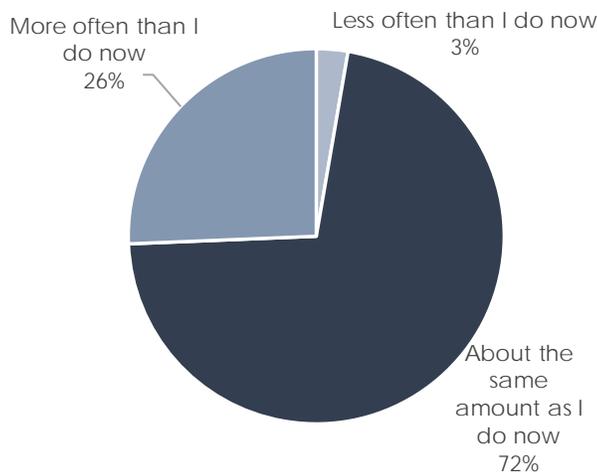
Figure 8 indicates that for 63% of Framingham Logan Express users, the availability of covered parking was an important factor in their decision to use Logan Express. It was very important for 28% of users.

Figure 8. Importance of Covered Parking for Framingham Logan Express



Another question asked the users of the Braintree, Woburn, and Peabody Logan Express services about the potential impact of the addition of covered parking at these sites (which don't offer it at present). Figure 9 shows that a little over a quarter of current users (26%) said they would use Logan Express more often if it offered covered parking at their current location.

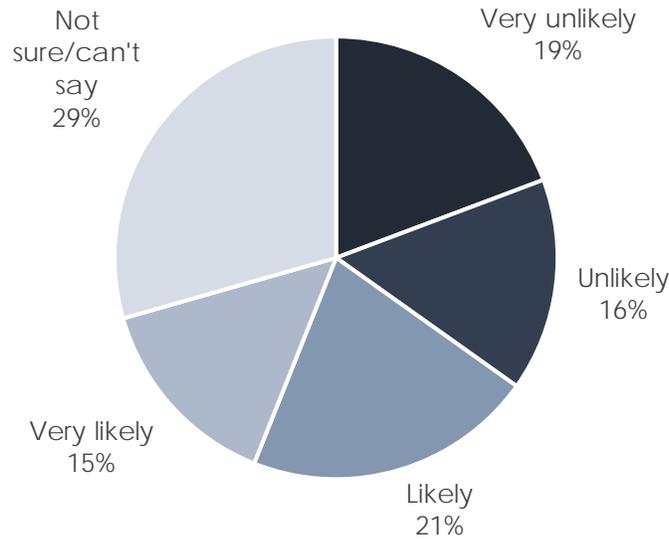
Figure 9. Impact on Braintree/Woburn/Peabody Logan Express Usage Frequency from Addition of Covered Parking



Finally, those passengers not using Logan Express were asked about how likely they'd be to use Logan Express if it offered covered parking. Figure 10 presents the results of this question, showing that over a third (36%) of respondents indicated that they'd be likely or very likely to use Logan Express if covered parking were offered.¹⁰

¹⁰ This question was asked of all non-users of Logan Express, and results therefore reflect, to some extent, the general relative attractiveness of Logan Express services (apart from the prospect of the covered parking feature) for each respondent. So for example, Logan Express facilities may not be a good option for air passengers originating within Route 128 whether or not covered parking is offered, etc.

Figure 10. Likelihood of Using Logan Express Among Non-Users if Covered Parking Offered



Disability status

As we have described, the current status question (employment status, retired, student, etc.) was expanded to describe the specific challenges of persons with disabilities. This additional detail allows us to be better understand both the incidence of specific disabilities among Logan Airport passengers, as well as the ground-access modes used by persons with disabilities at Logan.

Table 25 summarizes the incidence of reported disabilities or other challenges among Logan ground-access passengers in 2019. The table shows that 2.2% of respondents self-identified as a person with a disability, and 2.9% and 2.7% reported having trouble remembering flight information and challenges in wayfinding, respectively.

Table 25. Incidence of Disabilities Among Ground-Access Passengers: 2019

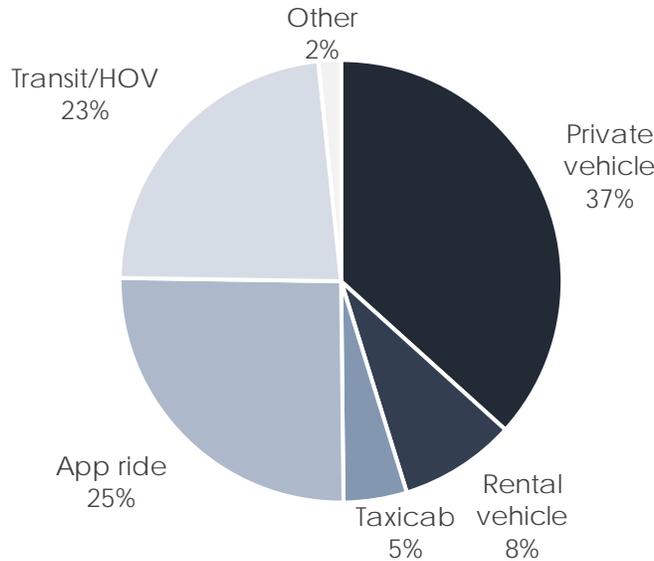
Disability Status	Frequency	Percentage
General disability	191	2.2%
Trouble wayfinding	232	2.7%
Trouble remembering flight info	253	2.9%
Visual challenges	92	1.0%
Auditory challenges	87	1.0%
Require wheelchair	94	1.1%
None of the above	7,778	88.8%
TOTAL	8,728	

Note: Total frequency varies from the total number of responses because respondents were allowed to choose more than one option, and some respondents did not complete this question.

Figure 11 summarizes the distribution of ground-access modes for those persons reporting one of more disabilities as described above. The figure shows that the mode shares are generally similar

to those of ground-access passengers as a whole, with a significant fraction (25%) using TNCs, and 37% using private vehicles.

Figure 11. Access Mode Distribution of Persons Reporting Disabilities (All Trips): 2019



Terminal waiting times

Only about 11% of weekday passengers are arriving at the terminal less than an hour before their scheduled departure time, as shown in Table 26. The largest fraction of weekday passengers arrived between 90 and 119 minutes prior to departure, with about another 20% arriving between 120 and 149 minutes beforehand. The average terminal waiting time is higher on weekends, likely reflecting the larger proportion of non-business (and less frequent) travelers.

Table 26. Terminal Waiting Time Distribution by Day Type: 2019

Parking Duration	Weekday	Weekend	All Days
Shorter than 60 minutes	11.3%	9.7%	10.9%
60 to 89 minutes	19.6%	19.1%	19.5%
90 to 119 minutes	26.6%	30.4%	27.6%
120 to 149 minutes	19.9%	19.9%	19.9%
150 to 179 minutes	9.2%	8.4%	9.0%
180 minutes or more	13.3%	12.6%	13.1%
TOTAL	100.0%	100.0%	100.0%

Egress mode

Table 27 provides a breakdown of egress mode in 2019, reflecting in the case of residents the modes passengers planned to use to leave the airport when they return, and for non-residents the egress mode used when passengers first arrived at the airport. As with access to the airport, private vehicle and TNC make up the largest share of the total, with private vehicle constituting about 35% of all trips (including those picked up by others as well as those using vehicles parked at the airport), and TNC representing about 25%. The shares of HOV/transit modes are also similar to their respective shares for access trips.

Table 27. Egress Mode Distribution by Day Type: 2019

Egress Mode	Weekday	Weekend	All Days
Picked up by someone else	23.0%	26.5%	23.9%
Private vehicle parked at airport	12.6%	8.2%	11.4%
Rental vehicle/Zipcar	7.7%	10.4%	8.4%
Taxicab	9.6%	7.0%	8.9%
Regular app ride (UberX, UberXL, Lyft)	20.5%	21.6%	20.8%
Premium app ride (UberSELECT, UberBLACK, Lyft Premier, Lyft Lux)	1.4%	1.6%	1.5%
Shared app ride (UberPool, Lyft Line)	2.8%	2.9%	2.8%
Car service ("black car," limo, etc.)	3.0%	3.2%	3.0%
Free courtesy shuttle	2.0%	2.3%	2.1%
Other shared ride van or limo	0.5%	0.8%	0.6%
MBTA Blue Line subway	2.3%	1.9%	2.2%
MBTA Silver Line bus	3.7%	3.2%	3.5%
Logan Express bus	4.3%	3.7%	4.1%
Other scheduled express bus	3.6%	3.1%	3.5%
Charter/tour bus	0.7%	1.4%	0.9%
Water ferry or water taxi	0.2%	0.2%	0.2%
Other	2.1%	2.2%	2.1%
TOTAL	100.0%	100.0%	100.0%

5. CONCLUSIONS AND RECOMMENDATIONS

Overview

The 2019 Air Passenger Ground-Access Survey was conducted at Logan Airport from April 22 – May 5, 2019. A total of 252 flights were sampled for an achieved sample of 8,763 responses, exceeding the target sample size of 8,000.

While all prior iterations of the survey had employed pencil-and-paper questionnaires, all-electronic data collection was employed for the first time in 2019. Despite some technical challenges in the first two days of the survey, this transition proved successful, both in validating our assumptions about the relative productivity of electronic methods and proving the feasibility of these methods in fieldwork of this large scale. In addition, the use of the all-electronic method eliminated the time and cost associated with data entry, reducing the required turnaround time to obtain the database of responses from weeks to a few days. It also lessened the effort required for data cleaning by allowing us to include validation procedures in the electronic questionnaire.

The results of the survey indicate that App Ride/TNC share has more than doubled since the prior survey, now representing nearly 30% of all ground-access trips, up from its 2016 level of 14.3%. Private vehicle share has declined slightly from 2016, most notably in the Dropped Off category. HOV share is 40.5% in 2019 under the new definition, which is slightly below the level that would have obtained had the new method be used in 2016 (41.7%).

Consistent with prior surveys, resident non-business travelers make up the largest segment of weekday ground-access passengers at 42.4% of the total (41.8% for all days), and business travelers comprise about 40% of the weekday total overall (about 37% for all days). The demographic composition of ground-access passengers has likewise remained very similar, with a near even split by gender, and significantly higher income than the region as a whole.

Lessons learned

In addition to the results described above, there were also a number of issues identified during the design, administration, and analysis of the 2019 survey that may warrant consideration in planning subsequent survey projects. In this section we summarize these issues, breaking them into three basic categories: those dealing with the questionnaire design, those having to do with the logistics of survey administration, and those dealing with the applicability and comparability of the results with future surveys. Each of these areas is discussed in further detail below.

Questionnaire design

The all-electronic data collection implemented for the first time in the 2019 survey has several implications for questionnaire design. In order to maximize comparability with prior surveys and limit any addition burden on respondents that might reduce the response rate, the decision was ultimately made (after some internal discussion) to reflect, ostensibly, the basic design of the 2016 questionnaire in programming the questionnaire for 2019.

As a practical matter, this meant the key question on access mode again asked respondents to indicate their *primary* mode used for ground-access. While the questionnaire also includes follow up questions about methods of accessing the primary mode, it is not entirely comprehensive with respect to all of the modes used or the order in which they were taken, etc.

The October 2018 survey conducted as part of the Parking Freeze Study included additional questions to capture more detail on trips using multiple access modes and their order. We know from prior experience that the access mode question has historically caused some confusion among a small number of respondents, and adding additional questions on multiple mode order may have the potential to add further precision to the mode share results. However, any added precision needs to be weighed against the added burden on respondents that in turn might negatively affect the response rate, as well as the comparability with results from prior years.

The 2019 survey also used a separate, paper form to administer screening questions to qualify prospective respondents, consistent with prior surveys. After some internal discussion it was concluded that incorporating screening questions into the electronic portion of the survey might be too burdensome for the fieldworkers and lead to other errors. However, a certain number of survey responses had to be discarded because they could not be matched to survey flights, and the fieldworker records ultimately required a fair amount of post-hoc validation. These issues might be mitigated if at least a portion of the screening could be automated within the electronic framework. Any such revisions to the procedures should be weighed against practical considerations such as fieldworker burden and productivity, logistical considerations, and the potential for other errors, etc.

Survey administration

As we have described, the 2019 survey confirmed the relatively lower productivity of all-electronic data collection vis-à-vis the pencil and paper method. The sample contained 22% more flights than in 2016, and a larger complement of fieldworkers was likewise required. New procedures enacted since 2016 also required the contract signatory to serve as Badging Coordinator (the fieldwork lead at GSMR has served in this capacity previously), resulting in additional time and expense for the fieldwork portion of the project.

Our assumptions about response rates and the overall feasibility of the transition to electronic format were also validated, however. It was evident that the number of tablets per fieldworker is a binding constraint on the survey productivity, such that having more tablets available would likely further improve the overall response rate.

Initially most fieldworkers had four tablets each; later in the survey some were taking six or more (in one case one fieldworker took twelve). The weight of the devices is an important limiting factor, as is the need to keep track of all of the devices and ensure that they're all collected, etc. The use of lightweight portable carts to carry the tablets between flights facilitated the use of larger numbers of tablets.

Significant technical issues impeded the collection of survey data during the morning of the first two days of the survey. Ultimately the problem was traced by the online survey hosting vendor to overnight server maintenance procedures being conducted concurrently with the earliest survey flights (the servers are in Texas and the fieldwork began on these days at around 4:00 am, or

3:00 am Texas time). For future surveys, the requirement to be online in these early morning hours should be made clear to the online survey hosting vendor, and the availability of their servers during this time should be confirmed in advance. The survey also confirmed the necessity of having *both* reliable cellular and WiFi connections to ensure connectivity to the online survey platform at all times.

As in prior years, we were unable to collect the boarding counts required for weighting the responses for some survey flights, and these counts subsequently had to be requested from the airlines by Massport staff. The need for missing counts wasn't always reported to Massport in a timely manner, and this negatively affected our ability to obtain all of the needed data (thus requiring us to estimate counts for some flights). A more formal protocol requiring the fieldwork supervisor to *immediately* report missing boarding counts *directly* to the Massport project manager would likely help mitigate this problem.

Some boarding counts were evidently not obtained by the fieldworkers because they needed to move on to the next survey flight. In future surveys, ensuring that all fieldworkers are instructed that boarding counts must be requested before leaving the flight, and/or having fieldworkers request the counts at the start of surveying each flight may further address this issue.

Finally, the use of postcards to capture late arrivers resulted in a very modest response rate, consistent with the methods used previously to capture these passengers, but also proved to be a relatively simple and cost effective method to address the late arriver issue.

Relationship to other surveys

Comparison of the survey results to both the prior iteration of the survey and the October 2018 survey conducted for the Parking Freeze Study implies some potentially important lessons for both the timing and periodicity of the survey. The more than doubling of the TNC share since 2016 and its impact on other modes indicates that very significant changes can happen within the three-year window between surveys. Likewise, while the 2018 results are generally consistent in many important results with the 2019 survey, important differences were observed that are likely the results of seasonal variations in travel patterns.

These results demonstrate the additional utility that would be gained from more frequent administration of the Air Passenger Survey, as well as potential additional data collection at other times of year.

Recommendations

In the light of the above, we offer the following recommendations for future iterations of the Air Passenger Survey at Logan:

1. *Use 2019 results as a starting point for future sampling plans.* Execution of the 2019 survey validated our assumptions about survey productivity using electronic data collection, such that the achieved 35 completes per flight should serve as a starting point for determining the number of survey flights to sample in subsequent surveys, assuming no significant change in the overall expected passengers per flight. This value could be

further adjusted depending on the assumed number of tablets per fieldworker, as increasing this latter value would likely improve the overall response rate.

2. *Facilitate the use of more tablets per fieldworker.* The number of tablets/fieldworker could be increased even without increasing the number of tablets (we rented 60), but will require steps to ease the logistical burden on fieldworkers. Lightweight, wheeled carts to transport the tablets between flights should be provided to all fieldwork teams (or each fieldworker), and brightly colored cases could be used to make the tablets easier to keep track of while in use by respondents. In addition, installation of tracking devices/software could reduce fieldworker anxiety over keeping track of larger numbers of tablets. If these accommodations are made, we believe the binding constraint on the number of tablets per fieldworker will be the number of respondents they can approach and screen, not the physical limitations imposed by the devices. As such, we recommend that each fieldwork team should have a minimum of six tablets per fieldworker, and the capability to carry ten to twelve where practical.
3. *Consider increasing the frequency of the survey.* Conducting the survey every two years or even annually would help Massport better capture the very rapid changes now occurring in ground-access at Logan, particularly as regards the still evolving TNC market. It would also help Massport anticipate and prepare for additional expected future changes in ground-access through the advent of new technologies such as autonomous vehicles, and provide important data to support the significant policy changes required to manage the airport's limited landside infrastructure.
4. *Revisit adding seasonal waves.* Given that the 2018 Parking Freeze Study survey confirmed the presence of important seasonal difference in ground-access patterns at Logan, Massport should again consider the feasibility and implications of spreading the data collection over different periods within the year. Any decision to alter the survey period will of course need to be weighed against the potential (negative) implications for comparability with prior years and the efficiency and cost effectiveness of the fieldworker effort, required sample sizes, etc.
5. *Continue to explore novel data collection methods, particularly for late arrivers.* The 2019 survey confirmed the feasibility of all-electronic data collection for a survey of this large scale, and the use of postcards proved to be a reasonably effective method to address the late arriver problem. Given that changes to both traveler behavior and logistical considerations will likely present further challenges to efficient and (unbiased) survey data collection going forward, Massport should build on the success of the 2019 survey and continue to monitor and explore further refinements to data collection procedures to take advantage of new and evolving data collection technologies and methods.

APPENDIX A: SURVEY QUESTIONNAIRE

Survey Overview

You have been selected to participate in Logan Airport's 2019 Air Passenger Ground Access Survey. Every person aged 18 or older boarding this flight (except those who arrived at Logan Airport today by air) is asked to fill out a questionnaire. When several people are traveling together, each one aged 18 or older should complete his or her own survey. Your answers are important and will help Logan Airport serve the public better. All replies are strictly confidential and will be used only for this study.

Survey Instructions

Please use the "Next" and "Previous" buttons in the lower right-hand corner of the screen to navigate the survey. It is important that you do not use your web browser's "forward" and "back" buttons because your new answers will not be recorded.

Please click "Next" to begin.

[Next >](#)

0

Part 1: Your trip to Logan Airport today

For transportation agencies to improve ground travel options to the airport, it is very important for us to know exactly where passengers start their trips. Please give as much detail as you are able.

From where did you start your ground trip to come to Logan Airport for today's flight?

- My home
- Other residence
- Business/office
- University/college
- Hotel/motel
- Airbnb, VRBO, FRBO, or similar
- Convention center
- Other (please specify): _____

1

Part 1: Your trip to Logan Airport today

At which university or college did you start your ground trip to come to Logan Airport?

[respondent will type in and list below will auto-populate based on first few letters typed]

- Emerson College
- Harvard University
- MIT
- Northeastern University
- ...
- Other: specify _____

2 [asked only of those indicating university/college Q1.1]

Part 1: Your trip to Logan Airport today

At which hotel or motel did you start your ground trip to come to Logan Airport?

[respondent will type in and list below will auto-populate based on first few letters typed]

- Doubletree
- Embassy Suites
- Hilton – Airport
- Hilton – Back Bay
- Holiday Inn
- Marriott – Copley Square
- Marriott – Long Wharf
- ...
- Other: specify _____

3 [asked only of those indicating hotel/motel Q1.1]

Part 1: Your trip to Logan Airport today

What was the address of this location where your trip to the airport began? Please use business name only if you do not know the address or intersection.

Number Street Name Nearest cross street (if no street number)

City or Town or Boston neighborhood State Zip Code

[address will auto-fill based on entry in Q1.1b for those indicating university/college or hotel/motel in Q1.1]

4

Part 1: Your trip to Logan Airport today

At approximately what time did you . . .

... leave your starting point to come to the airport? Please select a time

5:00 AM
5:05 AM
5:10 AM

... arrive at the departures level of this airport terminal? Please select a time

5:00 AM
5:05 AM
5:10 AM

5

Part 1: Your trip to Logan Airport today

How did you arrive at Logan Airport for today's flight? (check one only to show the primary form of transport you used to reach the airport)

Private Vehicle or Rental Vehicle

- private vehicle (car, minivan, SUV, motorcycle, etc.)
- rental vehicle (including Zipcar)

Taxi, Car Service, Shuttle, or Van

- taxicab
- regular app ride (UberX, UberXL, Lyft)
- premium app ride (UberSELECT, UberBLACK, Lyft Premier, Lyft Lux)
- shared app ride (UberPool, Lyft Line)
- car service ("black car," executive sedan, private limo, etc.)
- free hotel or other courtesy shuttle
- other shared ride van or limo

Bus, Subway, Rail, or Water

- Logan Express bus
- other scheduled express bus service
- charter/group tour bus
- MBTA bus/subway
- MBTA water ferry
- MBTA commuter rail
- water taxi

Other

- walk
- bike
- other, please specify: _____

6 Previous Next

Part 1: Your trip to Logan Airport today

Was this <private/rental> vehicle

- Driven away from the airport **without being parked**
- Temporarily parked** (short-term) at the airport in a **terminal garage or lot** (Central Parking garage, Terminal B garage, Terminal E lot) and THEN **driven away** from the airport
- parked** at the airport in a **terminal garage or lot** (Central Parking garage, Terminal B garage, Terminal E lot)
- parked** at the airport in the **economy parking garage** (because I *preferred* economy parking)
- parked** at the airport in the **economy parking garage** (because I was *directed* to economy parking)
- parked** at the airport in an **overflow lot**
- parked** in a **lot off airport** (Park-Shuttle-Fly, PreFlight, Thrifty Parking, etc.)
- returned to the Rental Car Center**

7 [asked only of those indicating private or rental vehicle in Q1.4]

Part 1: Your trip to Logan Airport today

How long do you expect to be parked at Logan?

- Under 4 hours
- 4-24 hours
- Longer: _____ days

8 [asked only of those indicating vehicle parked at airport in Q1.4]

Part 1: Your trip to Logan Airport today

Which rental car company did you use?

Please select a company

- Hertz
- Avis
- Budget
- Zipcar
- ...
- Other: specify _____

9 [asked only of those indicating rental vehicle in Q1.4]

Part 1: Your trip to Logan Airport today

At which Logan Express location did you board?

- Back Bay
- Braintree
- Framingham
- Woburn
- Peabody

10 [asked only of those indicating Logan Express in Q1.4]

Part 1: Your trip to Logan Airport today

Which other shared ride van or limo company did you use?

Please select a company

- Company 1
- Company 2
- Company 3
- ...
- Other: specify _____

11 [asked only of those indicating other shared ride van or limo in Q1.4]

Part 1: Your trip to Logan Airport today

Which other scheduled bus service did you use?

Please select a company

- C&J
- Concord Trailways
- Plymouth & Brockton
- Other: specify _____

12 [asked only of those indicating other scheduled bus in Q1.4] Previous Next

Part 1: Your trip to Logan Airport today

Which MBTA service did you use for your airport trip?

- Blue Line only
- Silver Line only
- Blue Line and other MBTA subway/bus/commuter rail
- Silver Line and other MBTA subway/bus/commuter rail
- MBTA Bus Route 171

13 [asked only of those indicating MBTA in Q1.4]

Part 1: Your trip to Logan Airport today

At which MBTA station did you begin your trip?

Please select a LINE or ROUTE

- Silver Line
- Blue Line
- Green Line
- Orange Line
- Red Line
- Commuter Rail
- Ferry
- Other

Please select a STATION

- Station 1
- Station 2
- Station 3
- Specify: _____

14 [asked only of those indicating MBTA in Q1.4]

Part 1: Your trip to Logan Airport today

How did you get to the location where you boarded the vehicle? (Check all that apply)

- walked
- drove and parked
- dropped off
- taxicab
- Uber or Lyft
- bus
- subway
- commuter rail
- bicycle
- other: _____

15 [asked only of those indicating bus, subway, or water in Q1.4]

Part 1: Your trip to Logan Airport today

a. How many people came to the airport together and are traveling on the same flight as you?

Number of people, including you: _____

Number of them completing a questionnaire, including you: _____

b. How many people were in your vehicle when it arrived at the airport, including the driver?

Number of people, including you: _____

c. Were you or any passengers dropped off at a terminal? If so, how many?

Yes

No

[IF YES:] Number of people who were dropped off, including you: _____

16

Part 1: Your trip to Logan Airport today

If the means of travel you used to get to the airport today were not available, how would you have arrived at the airport instead?

- private vehicle – dropped off
- private vehicle – parked at Central Parking
- private vehicle – parked at Economy
- private vehicle – parked at Terminal B or E
- private vehicle – parked off-airport
- rental vehicle/Zipcar
- taxicab
- regular app ride (UberX, UberXL, Lyft)
- premium app ride (UberSELECT, UberBLACK, Lyft Premier, Lyft Lux)
- shared app ride (UberPool, Lyft Line)
- car service ("black car," limo, etc.)
- free courtesy shuttle
- other shared ride van or limo
- MBTA Blue Line subway
- MBTA Silver Line bus
- Logan Express – Back Bay
- Logan Express – Braintree
- Logan Express – Framingham
- Logan Express – Peabody
- Logan Express – Woburn
- other scheduled bus
- water ferry/water taxi
- other (or name of service): _____

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Part 1: Your trip to Logan Airport today

Certain airline or government programs, either based on status or for a fee, provide for expedited security screening, effectively allowing you to "skip to the head of line."

a. Which of the following of these programs have you used or are you aware of? (check all that apply)?

<input type="checkbox"/> Even More Speed (JetBlue)	<input type="checkbox"/> TSA Pre-Check
<input type="checkbox"/> Priority Privileges (American)	<input type="checkbox"/> Global Entry
<input type="checkbox"/> Sky Priority (Delta)	<input type="checkbox"/> NEXUS
<input type="checkbox"/> Premier Access (United)	<input type="checkbox"/> Clear
<input type="checkbox"/> Flyby Priority Lane (Southwest)	<input type="checkbox"/> None of the above

b. How often do you or have you used the Logan Express bus service for your travel to Logan Airport?

Often Sometimes Never

c. How likely would you be to use Logan Express for your travel to Logan Airport if it included "head of the line" privileges like those programs described above, at no additional cost?

Very unlikely Unlikely Likely Very likely Not sure/can't say

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Part 1: Your trip to Logan Airport today

d. [Q1.4 e = Framingham] How important was the availability of covered parking (a parking garage) at the Framingham terminal in your decision to use Logan Express?

Not important Somewhat important Very important

e. [Q1.4 e = Braintree/Woburn/Peabody] How often would you use Logan Express if it offered covered parking (a parking garage) at the [Q1.4e location] bus terminal?

Less often than I do now About the same amount as I do now More often than I do now

f. [Q1.4 c < Logan Express] How likely would you be to use the Logan Express bus service for your travel to Logan Airport if it offered covered parking (a parking garage) at the bus terminal?

Very unlikely Unlikely Likely Very likely Not sure/can't say

19

Part 2: Your flight today from Boston

Which flight are you taking from Logan today?

<select airline>

- Alaska Airlines
- Allegiant Air
- American Airlines
- ...
- Virgin America

<enter flight number>

20

Part 2: Your flight today from Boston

What will be your final destination airport on today's air trip?

City/airport:

U.S. state or foreign country:

21

Part 2: Your flight today from Boston

Is your air travel today primarily part of a business trip?

Yes

No

22

Part 2: Your flight today from Boston

Will your airline ticket, ground transportation to the airport, or your parking cost be reimbursed by your employer or other organization? (Don't count payment by a friend or relative.)

Yes, some or all of the costs will be paid back to me

No, my costs will not be reimbursed

23

Part 2: Your flight today from Boston

In total, how many pieces of luggage are all the people traveling in your party taking on this flight?

Number of pieces checked:	Number of pieces carried on board:
<input type="checkbox"/> None (didn't check any bags)	<input type="checkbox"/> None (not carrying on any bags)
<input type="checkbox"/> 1	<input type="checkbox"/> 1
<input type="checkbox"/> 2	<input type="checkbox"/> 2
<input type="checkbox"/> 3	<input type="checkbox"/> 3
<input type="checkbox"/> 4 or more	<input type="checkbox"/> 4 or more
<input type="checkbox"/> Not sure/can't say	<input type="checkbox"/> Not sure/can't say

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Part 2: Your flight today from Boston

Is Logan Airport the "home" end of your air trip?

Yes
 No

25

Part 2: Your flight today from Boston

a. When [resident: will you return to/visitor: did you fly into] Logan?

Today
 Tomorrow
 ____ days from now

b. What time of day [resident: will your return flight /visitor: did your flight] arrive at Logan?

Please select a time

5:00 AM
 5:05 AM
 5:10 AM

26

Part 2: Your flight today from Boston

[resident]: How do you expect to travel from Logan Airport when you return?
[visitor]: How did you travel from Logan Airport when you arrived?

<input type="checkbox"/> picked up by someone else	<input type="checkbox"/> MBTA Blue Line subway (& shuttle bus)
<input type="checkbox"/> private vehicle parked at airport	<input type="checkbox"/> MBTA Silver Line bus
<input type="checkbox"/> rental vehicle/Zipcar	<input type="checkbox"/> Logan Express bus
<input type="checkbox"/> taxicab	<input type="checkbox"/> other scheduled express bus
<input type="checkbox"/> regular app ride (UberX, UberXL, Lyft)	<input type="checkbox"/> charter/tour bus
<input type="checkbox"/> premium app ride (UberSELECT, UberBLACK, Lyft Premier, Lyft Lux)	<input type="checkbox"/> water ferry or water taxi
<input type="checkbox"/> shared app ride (UberPool, Lyft Line)	<input type="checkbox"/> other: _____
<input type="checkbox"/> car service ("black car," limo, etc.)	
<input type="checkbox"/> free courtesy shuttle	
<input type="checkbox"/> other shared ride van or limo	

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Part 3: About you

The following questions are for classification purposes only. All replies are strictly confidential and will be used only for this study.

Are you ...

Female
 Male
 Other/prefer to self-identify
 Prefer not to say

28

Logan International Airport
2019 AIR PASSENGER SURVEY

Part 3: About you

3.2 In what year were you born?

Please select a YEAR

- prefer not to say
- 2001
- 2000
- 1999
- ...
- 1920
- 1919

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Logan International Airport
2019 AIR PASSENGER SURVEY

Part 3: About you

3.3 Where is your home (primary or current residence)?

Country:

- United States
- Alghanistan
- Albania
- Algeria
- American Samoa
- ...

City or town:

Home Postal Code:

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Logan International Airport
2019 AIR PASSENGER SURVEY

Part 3: About you

3.4 a. How many people live in your household?

b. How many automobiles do you and other members of your household own or lease?

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Logan International Airport
2019 AIR PASSENGER SURVEY

Part 3: About you

3.5 a. Which of the following describe your current status (check all that apply)?

- Working full time
- Working part time
- Student
- Retired
- Not working/other
- None of the above

b. Which of the following describe you (check all that apply)?

- I am a person with a disability
- I sometimes have trouble finding my way through the airport
- I sometimes have trouble remembering information about my flight
- I have visual challenges that sometimes make reading signs difficult
- I have auditory challenges that sometimes make hearing announcements difficult
- I sometimes require a wheelchair or other assistance in moving through the airport and/or boarding my flight
- None of the above

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Logan International Airport
2019 AIR PASSENGER SURVEY

Part 3: About you

3.6 What was the total income (before taxes) for your household for the year 2018?

- Under \$30,000
- \$30,000 to under \$60,000
- \$60,000 to under \$90,000
- \$90,000 to under \$120,000
- \$120,000 to under \$150,000
- \$150,000 to under \$180,000
- \$180,000 to under \$200,000
- \$200,000 to under \$350,000
- \$350,000 to under \$500,000
- \$500,000 or more
- Prefer not to say

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Logan International Airport
2019 AIR PASSENGER SURVEY

Survey complete!

Thank you very much for completing the survey. Your responses will help Massport better plan for the future, and will be kept strictly confidential.

Please hand this tablet back to a member of the survey team.

24 FINISH

APPENDIX B: LIST OF SURVEY FLIGHTS

Date	Carrier	Dest	Flight	Time	Terminal	Seats	Completes
4/22/2019	DL	CVG	5195	7:30	A	76	28
4/22/2019	BA	LHR	238	7:30	E	224	43
4/22/2019	B6	TPA	2191	9:41	C	150	41
4/22/2019	AC	YHZ	8894	9:45	B	78	33
4/22/2019	B6	PUJ	2895	10:10	C	150	17
4/22/2019	DL	RDU	5096	11:38	A	76	17
4/22/2019	AA	DCA	2129	13:00	B	128	32
4/22/2019	AA	CLT	452	14:37	B	160	27
4/22/2019	B6	LAX	687	15:50	C	159	25
4/22/2019	DL	ATL	828	16:09	A	192	8
4/22/2019	B6	BUF	1215	16:33	C	100	31
4/22/2019	DL	ATL	959	17:30	A	192	20
4/22/2019	BA	LHR	212	19:15	E	469	109
4/22/2019	B6	FLL	2469	19:25	C	150	26
4/22/2019	WN	BWI	1022	20:50	A	143	24
4/22/2019	LX	ZRH	53	21:45	E	236	49
4/23/2019	AS	SEA	741	8:40	C	178	49
4/23/2019	AA	DCA	2160	9:00	B	128	27
4/23/2019	DL	ATL	776	9:00	A	199	32
4/23/2019	AA	ORD	1287	11:32	B	160	31
4/23/2019	AA	DCA	2139	12:00	B	99	14
4/23/2019	AA	PHX	1057	12:52	B	160	38
4/23/2019	WN	MDW	1343	14:25	A	175	54
4/23/2019	DL	PIT	5350	15:32	A	76	20
4/23/2019	UA	ORD	599	16:45	B	150	33
4/23/2019	HU	PEK	482	17:10	E	292	20
4/23/2019	DL	AMS	258	18:34	A	211	48
4/23/2019	AA	DCA	2120	19:00	B	128	18
4/23/2019	AA	ORD	1579	19:25	B	187	39
4/23/2019	EI	DUB	138	21:30	C	317	79
4/24/2019	WN	MKE	1688	5:20	A	143	15
4/24/2019	B6	DCA	1600	5:38	C	150	26
4/24/2019	UA	DEN	2214	6:00	B	179	50
4/24/2019	DL	TPA	1488	7:45	A	160	25
4/24/2019	B6	LAX	487	8:03	C	159	67
4/24/2019	UA	EWR	2165	8:05	B	166	44
4/24/2019	DL	ATL	776	9:00	A	199	27
4/24/2019	B6	EWR	2479	11:01	C	100	21
4/24/2019	B6	SAV	1749	11:25	C	100	25
4/24/2019	WN	AUS	1366	13:20	A	143	40

Date	Carrier	Dest	Flight	Time	Terminal	Seats	Completes
4/24/2019	WN	MDW	1343	14:25	A	175	38
4/24/2019	AA	DCA	2142	15:00	B	128	32
4/24/2019	UA	ORD	599	16:45	B	150	30
4/24/2019	DL	SFO	2851	17:15	A	199	22
4/24/2019	AA	LGA	2157	18:00	B	99	16
4/24/2019	B6	DEN	993	18:29	C	200	38
4/24/2019	AA	ORD	1579	19:25	B	187	39
4/24/2019	DI	LGW	7148	21:20	E	338	109
4/24/2019	B6	BUF	1615	22:45	C	100	15
4/25/2019	WN	MKE	1688	5:20	A	143	11
4/25/2019	DL	ATL	2286	7:00	A	192	51
4/25/2019	NK	BWI	1025	7:14	B	145	33
4/25/2019	UA	IAH	1254	7:15	B	150	44
4/25/2019	DL	ATL	776	9:00	A	199	56
4/25/2019	AA	DFW	2730	10:00	B	187	66
4/25/2019	DL	JFK	4008	10:50	A	76	20
4/25/2019	AA	CLT	1915	11:10	B	187	54
4/25/2019	WN	BWI	1952	14:10	A	143	34
4/25/2019	NK	MSY	467	14:19	B	145	50
4/25/2019	B6	SAN	19	15:55	C	159	26
4/25/2019	DL	ATL	828	16:09	A	192	22
4/25/2019	AA	PHL	258	17:25	B	187	35
4/25/2019	B6	PHX	603	17:45	C	150	28
4/25/2019	DL	DTW	323	19:03	A	192	24
4/25/2019	AS	SAN	769	19:30	C	159	55
4/25/2019	AA	DCA	2167	21:00	B	128	30
4/25/2019	B6	JAX	2009	21:20	C	150	9
4/25/2019	AZ	FCO	615	21:50	E	256	51
4/26/2019	DL	RDU	2385	6:33	A	110	28
4/26/2019	B6	EWR	2279	6:51	C	100	13
4/26/2019	B6	LAX	287	6:57	C	159	65
4/26/2019	WN	MDW	197	8:35	A	143	46
4/26/2019	AS	SEA	741	8:40	C	178	51
4/26/2019	DL	LGA	5989	10:00	A	76	30
4/26/2019	NK	MCO	433	11:01	B	228	48
4/26/2019	WN	HOU	2100	12:55	A	175	43
4/26/2019	B6	CHS	2267	13:20	C	100	44
4/26/2019	B6	BWI	1927	13:24	C	100	30
4/26/2019	B6	DTW	1237	15:55	C	100	28
4/26/2019	PD	YTZ	946	17:00	E	74	27
4/26/2019	NK	LAS	641	17:00	B	145	29
4/26/2019	TP	LIS	218	18:20	C	285	55
4/26/2019	DL	ATL	2593	18:35	A	192	23

Date	Carrier	Dest	Flight	Time	Terminal	Seats	Completes
4/26/2019	AA	PHL	878	20:21	B	99	29
4/26/2019	KL	AMS	618	20:40	E	292	32
4/26/2019	QR	DOH	744	23:05	E	335	66
4/27/2019	WN	BNA	5327	6:15	A	143	42
4/27/2019	AS	SEA	1737	7:00	C	149	75
4/27/2019	AA	PHL	1798	7:36	B	187	37
4/27/2019	B6	PBI	121	8:45	C	100	45
4/27/2019	WN	DEN	4738	9:05	A	175	62
4/27/2019	B6	SAV	1749	11:25	C	100	41
4/27/2019	AA	LAX	1161	12:20	B	187	48
4/27/2019	DL	JFK	4017	12:54	A	76	10
4/27/2019	AA	CLT	452	14:37	B	160	39
4/27/2019	DL	AMS	256	16:47	A	293	25
4/27/2019	AA	ORD	2619	17:37	B	160	42
4/27/2019	TP	LIS	218	18:20	C	285	39
4/27/2019	B6	JFK	317	18:58	C	100	16
4/27/2019	B6	ATL	997	21:10	C	100	13
4/27/2019	S4	PDL	220	21:20	E	176	25
4/28/2019	AA	PHX	2260	6:05	B	160	39
4/28/2019	B6	PLS	1353	7:00	C	150	13
4/28/2019	VS	LHR	158	8:15	E	264	35
4/28/2019	AA	CLT	653	9:35	B	150	65
4/28/2019	DL	LGA	5888	12:00	A	76	29
4/28/2019	DL	MCO	1919	12:00	A	157	34
4/28/2019	AA	DFW	2747	12:23	B	187	63
4/28/2019	B6	MSP	1735	14:40	C	100	33
4/28/2019	WN	BWI	4138	16:20	A	143	45
4/28/2019	B6	PSP	1405	16:54	C	150	21
4/28/2019	AA	MIA	2336	17:28	B	160	37
4/28/2019	UA	DEN	1140	18:06	B	179	35
4/28/2019	B6	RSW	1165	19:42	C	150	28
4/28/2019	B6	LGA	1431	20:04	C	100	33
4/28/2019	UA	SFO	1218	20:37	B	142	34
4/28/2019	B6	SDQ	129	22:35	C	150	22
4/29/2019	AA	DFW	132	5:00	B	187	16
4/29/2019	B6	FLL	569	5:37	C	150	39
4/29/2019	B6	MCO	51	5:45	C	200	50
4/29/2019	DL	PIT	5269	6:35	A	76	19
4/29/2019	AA	PHL	117	6:43	B	160	32
4/29/2019	B6	SFO	133	6:57	C	159	35
4/29/2019	B6	RSW	665	7:24	C	150	29
4/29/2019	B6	SFO	1833	9:10	C	159	39
4/29/2019	DL	CMH	5954	9:25	A	69	28

Date	Carrier	Dest	Flight	Time	Terminal	Seats	Completes
4/29/2019	AC	YHZ	8894	9:45	B	78	25
4/29/2019	AA	ORD	1287	11:32	B	160	43
4/29/2019	DL	JFK	4017	12:54	A	76	12
4/29/2019	JL	NRT	7	13:35	E	195	41
4/29/2019	B6	PBI	1921	14:30	C	200	21
4/29/2019	B6	BUF	1215	16:33	C	100	16
4/29/2019	B6	CLE	641	17:08	C	100	26
4/29/2019	DL	SFO	2851	17:15	A	199	33
4/29/2019	AA	LAX	241	18:25	B	160	20
4/29/2019	AA	ORD	1579	19:25	B	187	43
4/29/2019	UA	IAD	2136	19:45	B	150	28
4/29/2019	B6	SJU	61	20:50	C	150	7
4/29/2019	IB	BCN	2626	23:20	E	288	52
4/30/2019	NK	MYR	103	5:00	B	182	27
4/30/2019	AA	MIA	1418	5:35	B	160	22
4/30/2019	UA	EWR	1078	6:00	B	179	20
4/30/2019	UA	DEN	2214	6:10	B	179	46
4/30/2019	DL	ATL	2286	7:00	A	192	52
4/30/2019	DL	SFO	1553	7:15	A	199	24
4/30/2019	DL	ATL	2304	7:59	A	192	30
4/30/2019	DL	IND	5958	8:55	A	69	19
4/30/2019	AA	LGA	2152	9:00	B	99	15
4/30/2019	AA	DFW	2730	10:00	B	187	42
4/30/2019	UA	EWR	2394	11:00	B	179	25
4/30/2019	AA	ORD	1287	11:32	B	160	60
4/30/2019	AA	JFK	1140	12:00	B	102	9
4/30/2019	B6	PBI	1921	14:30	C	200	27
4/30/2019	DL	PIT	5350	15:32	A	76	13
4/30/2019	UA	SFO	351	15:55	B	142	37
4/30/2019	DL	RDU	5069	17:08	A	76	12
4/30/2019	AF	CDG	333	18:05	E	280	45
4/30/2019	B6	JFK	317	18:58	C	100	15
4/30/2019	DL	BNA	3590	19:28	A	76	11
4/30/2019	LH	MUC	425	20:10	E	285	67
4/30/2019	EK	DXB	238	23:10	E	356	25
5/1/2019	DL	DTW	2079	5:45	A	192	27
5/1/2019	AA	DCA	2159	6:00	B	128	28
5/1/2019	DL	SFO	2488	7:14	A	199	33
5/1/2019	B6	CLE	441	7:39	C	100	33
5/1/2019	B6	DCA	255	8:29	C	100	26
5/1/2019	B6	CHS	1667	9:40	C	150	27
5/1/2019	UA	DEN	416	9:45	B	179	70
5/1/2019	WN	BWI	1689	11:30	A	143	17

Date	Carrier	Dest	Flight	Time	Terminal	Seats	Completes
5/1/2019	F9	MCO	1239	12:10	E	186	33
5/1/2019	AC	YYZ	529	15:10	B	97	28
5/1/2019	UA	ORD	1598	15:10	B	150	35
5/1/2019	B6	SJC	471	15:48	C	150	25
5/1/2019	EI	DUB	136	17:50	C	317	37
5/1/2019	B6	RIC	381	18:06	C	100	20
5/1/2019	DL	ATL	2643	18:10	A	192	38
5/1/2019	AS	SAN	769	19:30	C	178	37
5/1/2019	NK	MCO	423	20:12	B	228	44
5/1/2019	DY	CDG	7150	22:00	E	344	49
5/1/2019	IB	BCN	2626	23:20	E	288	47
5/2/2019	AA	PHL	544	5:30	B	150	38
5/2/2019	UA	DEN	2214	6:10	B	179	11
5/2/2019	B6	MSP	835	6:30	C	150	23
5/2/2019	9K	ACK	5211	7:55	C	9	1
5/2/2019	VS	LHR	158	8:15	E	264	57
5/2/2019	UA	ORD	775	8:35	B	179	21
5/2/2019	AA	DCA	2125	11:00	B	128	19
5/2/2019	DL	ATL	800	11:00	A	192	50
5/2/2019	WN	HOU	2100	12:55	A	175	54
5/2/2019	B6	BNA	2807	13:27	C	150	43
5/2/2019	B6	DCA	1155	14:20	C	100	31
5/2/2019	AA	CLT	1453	16:09	B	160	32
5/2/2019	DL	AMS	256	16:41	A	293	30
5/2/2019	B6	RIC	381	18:06	C	100	21
5/2/2019	B6	SFO	833	18:20	C	159	40
5/2/2019	NK	FLL	615	18:36	B	182	25
5/2/2019	LH	MUC	425	20:10	E	285	94
5/2/2019	B6	EWR	2679	20:20	C	100	32
5/2/2019	B6	ATL	997	21:56	C	150	48
5/2/2019	DY	MAD	7754	23:00	E	344	86
5/3/2019	AA	DCA	2127	7:00	B	128	48
5/3/2019	DL	ATL	1501	7:00	A	192	26
5/3/2019	DL	SEA	2991	7:00	A	160	40
5/3/2019	DL	ATL	1880	9:00	A	199	41
5/3/2019	UA	LAX	2145	9:15	B	169	44
5/3/2019	AA	DCA	2130	10:00	B	128	21
5/3/2019	AA	MIA	1201	11:05	B	160	59
5/3/2019	JL	NRT	7	13:45	E	195	11
5/3/2019	B6	PBI	1921	14:04	C	150	37
5/3/2019	B6	DTW	1237	15:59	C	100	25
5/3/2019	B6	MSY	1301	16:22	C	150	41
5/3/2019	AA	LGA	2172	17:00	B	99	21

Date	Carrier	Dest	Flight	Time	Terminal	Seats	Completes
5/3/2019	DL	SFO	2821	17:15	A	199	28
5/3/2019	UA	DEN	1140	18:40	B	179	38
5/3/2019	AA	CLT	2687	18:58	B	150	25
5/3/2019	UA	EWR	2047	20:00	B	150	31
5/3/2019	B6	CLE	1841	20:53	C	100	32
5/3/2019	B6	LAX	987	21:30	C	159	26
5/3/2019	QR	DOH	744	23:05	E	335	27
5/4/2019	NK	MYR	103	5:05	B	228	43
5/4/2019	B6	UVF	363	7:01	C	150	53
5/4/2019	NK	BWI	1025	7:35	B	182	39
5/4/2019	DL	FLL	2984	8:40	A	160	39
5/4/2019	UA	LAX	2145	9:15	B	169	27
5/4/2019	B6	MSY	401	9:58	C	100	46
5/4/2019	B6	DCA	489	12:43	C	100	42
5/4/2019	B6	RDU	2783	12:55	C	100	26
5/4/2019	AA	PHX	1057	13:00	B	187	43
5/4/2019	B6	TPA	1991	15:57	C	100	27
5/4/2019	LH	FRA	423	17:05	E	354	108
5/4/2019	WS	YHZ	3713	18:35	A	78	3
5/4/2019	B6	DEN	993	18:42	C	200	33
5/4/2019	B6	MCO	1951	19:08	C	200	29
5/4/2019	BA	LHR	202	21:40	E	224	37
5/5/2019	AA	PHX	2260	6:16	B	187	17
5/5/2019	B6	PBI	721	6:30	C	200	51
5/5/2019	WN	BWI	3285	7:15	A	143	41
5/5/2019	AA	ROC	4743	7:55	B	50	8
5/5/2019	WN	DAL	25	8:30	A	175	30
5/5/2019	DL	JAX	6094	8:45	A	76	32
5/5/2019	B6	LGA	831	11:30	C	100	13
5/5/2019	DL	RDU	6302	11:30	A	76	29
5/5/2019	WN	HOU	3891	12:40	A	175	46
5/5/2019	DL	CLE	5026	14:10	A	76	18
5/5/2019	B6	ROC	713	15:25	C	100	27
5/5/2019	B6	FLL	69	16:29	C	100	25
5/5/2019	DL	AMS	256	16:41	A	293	30
5/5/2019	UA	SFO	2400	18:15	B	169	21
5/5/2019	B6	TPA	391	18:32	C	150	40
5/5/2019	AA	DCA	2120	19:00	B	128	55
5/5/2019	LH	MUC	425	20:10	E	285	61
5/5/2019	DY	CDG	7150	22:00	E	344	74

APPENDIX C: FIELDWORKER FORMS



Logan International Airport
2019 AIR PASSENGER SURVEY

FIELDWORKER
RECORD
SHEET

Date: ___/___/ 2019

Airline & flight number: _____ Scheduled departure: _____:____ AM PM

Fieldworker name: _____

Screening questions:

- "Hello. I am [your name], and we're contacting passengers on behalf of Massport. Are you traveling on [airline] flight [number] to [city] today? **[If the flight has more than one destination say instead 'that's leaving from this gate?'** *If no, terminate and thank.*
- *If yes, continue:* "Are you starting your air trip here at Logan Airport, or are you just changing planes (connecting) here?"
- *If trip is starting here and under 18: terminate, thank, and tally in BOX 3 below.*
- *If respondent's trip is starting here and the respondent is 18 or older, continue:*
"The airport is conducting a special survey to find out how people traveled to the airport. Would you please take this survey before you board? All answers are confidential. Once you finish the survey you should hand this tablet back to me. If you have any questions, please see me." *Tally passengers accepting survey in BOX 1 below.*
- *If respondent is connecting here, continue:* "We're counting the number of people who are connecting here. Has anyone asked you these questions already?"
Thank & tally passengers connecting in BOX 4 below.
- *For late-arriving passengers unable to take survey before boarding, offer postcard.*
Thank & tally passengers taking postcards in BOX 2 below.
- *Thank and tally all passengers refusing survey in BOX 5 or BOX 6 below.*

TALLY OF PASSENGERS APPROACHED			
1	Surveys Accepted	<i>Put a check mark for each passenger accepting the survey</i>	<i>Total</i>
2	Postcards Distributed	<i>Put a check mark for each passenger taking a postcard</i>	<i>Total</i>
3	Under 18	<i>Put a check mark for each passenger who is under 18</i>	<i>Total</i>
4	Connecting	<i>Put a check mark for each passenger who is connecting</i>	<i>Total</i>
5	Refusal – No Reason	<i>Put a check mark for each passenger who refused the questionnaire (no reason)</i>	<i>Total</i>
6	Refusal – No English	<i>Put a check mark for each passenger who refused because they can't speak English</i>	<i>Total</i>



Date: _____/_____/2019

Name: _____ (Team Leader)

Airline and Flight number: _____

Flight destination: _____ (Next Stop)

Scheduled departure time: _____

Actual departure time: _____

Fieldwork starting time: _____

Fieldwork ending time: _____

Total surveys distributed: _____

Postcards distributed: _____

Total surveys refused: _____

No reason _____ *No English* _____

Passengers under 18: _____ (from FRSs)

Comments: _____

Enter Boarding Counts from Gate Agent:	
<i>Total Departing Passengers</i>	<i>Passengers Connecting in Boston</i>