NEW ISSUE-BOOK-ENTRY ONLY

Ratings: Moody's: Aa2
Fitch: AA
S&P: AA
See "RATINGS" herein.

In the opinion of Foley & Lardner LLP, Co-Bond Counsel, based upon an analysis of existing laws, regulations, rulings, and court decisions and assuming, among other matters, the accuracy of certain representations and compliance with certain covenants, interest on the 2019 Bonds is excluded from gross income for federal income tax purposes under Section 103 of the Internal Revenue Code of 1986, as amended (the "Code"), except for interest on any 2019-C Bond for any period during which such 2019-C Bond is held by a person who is a "substantial user" of facilities financed with the proceeds of the 2019-C Bonds or a "related person" of such a substantial user (within the meaning of Section 147(a) of the Code). In addition, interest on the 2019-B Bonds is not a specific preference items for purposes of the federal alternative minimum tax. Interest on the 2019-C Bonds is a specific preference item for purposes of the federal alternative minimum tax. In the opinion of Kaplan Kirsch & Rockwell LLP, Co-Bond Counsel, the 2019 Bonds, their transfer and the income therefrom (including any profit made from their sale) will be exempt from taxation within The Commonwealth of Massachusetts. Co-Bond Counsel express no opinion as to whether the 2019 Bonds or the interest thereon will be included in the measure of Massachusetts estate and inheritance taxes and certain Massachusetts corporation excise and franchise taxes. Co-Bond Counsel express no opinion regarding any other federal or Massachusetts tax consequences, or regarding tax consequences of states other than The Commonwealth of Massachusetts. See "TAX MATTERS" herein.

$455,045,000
MASSACHUSETTS PORT AUTHORITY
$157,680,000 Revenue Bonds, Series 2019-B (Non-AMT)
$297,365,000 Revenue Bonds, Series 2019-C (AMT)

Dated: Date of Delivery **Due: July 1, as shown on page (i) hereof**

The Massachusetts Port Authority (the "*Authority*") is issuing its Revenue Bonds, Series 2019-B (the "*2019-B Bonds*") and its Revenue Bonds, Series 2019-C (the "*2019-C Bonds*," and together with the 2019-B Bonds referred to herein as the "*2019 Bonds*") to finance (i) certain capital improvements and related costs of the Authority, including capitalized interest thereon, (ii) the Reserve Requirement applicable to the 2019 Bonds and (iii) costs of issuing the 2019 Bonds, all as described herein. The 2019 Bonds will be secured on a parity basis with the Authority's outstanding senior revenue bonds, as more fully described herein. **The 2019 Bonds will be payable solely from Revenues of the Authority which are pledged under the 1978 Trust Agreement, from passenger facility charges ("PFCs") irrevocably committed to such payment by the Authority from time to time, and from certain funds and accounts held by the Trustee, all as described herein. The Authority has no taxing power. The 2019 Bonds will not constitute a debt, or a pledge of the faith and credit, of The Commonwealth of Massachusetts or of any political subdivision thereof.**

The 2019 Bonds will be issued as fully registered bonds and, when issued, will be registered in the name of Cede & Co., as registered owner and nominee for The Depository Trust Company, New York, New York ("DTC"). Purchasers will acquire beneficial ownership interests in the 2019 Bonds in denominations of $5,000 or integral multiples thereof and will not receive physical delivery of bond certificates. So long as Cede & Co. is the registered owner of the 2019 Bonds, principal, premium, if any, and interest will be payable by U.S. Bank National Association, Boston, Massachusetts, as trustee (the "Trustee"), to Cede & Co., as nominee for DTC. See "THE 2019 BONDS – Book-Entry Only Method."

The 2019 Bonds will bear interest from their date of original delivery, payable each January 1 and July 1, commencing January 1, 2020.

The 2019 Bonds are subject to optional and mandatory redemption prior to maturity as described herein.

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

The 2019 Bonds are offered when, as and if issued by the Authority and received by the Underwriters, subject to the receipt of an unqualified approving opinion as to legality of Kaplan Kirsch & Rockwell LLP, Boston, Massachusetts, and Foley & Lardner LLP, Chicago, Illinois, Co-Bond Counsel, and certain other conditions. Certain legal matters will be passed upon for the Authority by its Disclosure Counsel, Locke Lord LLP, Boston, Massachusetts, and for the Underwriters by their counsel, Hinckley, Allen & Snyder LLP, Boston Massachusetts. PFM Financial Advisors LLC, San Francisco, California, serves as Financial Advisor to the Authority. Delivery of the 2019 Bonds to DTC or its custodial agent is expected in New York, New York on or about July 17, 2019.

Citigroup

BofA Merrill Lynch **Loop Capital Markets**

July 10, 2019

Massachusetts Port Authority
Capital Programs Department
June 2019

Approximate Massport Property

Massport Properties Harborwide

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

N

0 1600 3200
in feet

Massachusetts Port Authority

$157,680,000
Revenue Bonds, Series 2019-B (Non-AMT)

Maturity (July 1)	Amount	Interest Rate	Yield	CUSIP[†]	Maturity (July 1)	Amount	Interest Rate	Yield	CUSIP[†]
2022	$1,000,000	3.00%	1.25%	575896 TP0	2031	$3,810,000	5.00%	1.91%*	575896 TY1
2023	2,605,000	4.00	1.27	575896 TQ8	2032	4,000,000	5.00	1.97*	575896 TZ8
2024	2,705,000	5.00	1.32	575896 TR6	2033	4,200,000	5.00	2.02*	575896 UA1
2025	2,840,000	5.00	1.39	575896 TS4	2034	4,410,000	5.00	2.07*	575896 UB9
2026	2,985,000	5.00	1.50	575896 TT2	2035	4,630,000	5.00	2.12*	575896 UC7
2027	3,135,000	5.00	1.58	575896 TU9	2036	4,860,000	5.00	2.17*	575896 UD5
2028	3,295,000	5.00	1.67	575896 TV7	2037	5,105,000	5.00	2.21*	575896 UE3
2029	3,455,000	5.00	1.76	575896 TW5	2038	5,360,000	5.00	2.25*	575896 UF0
2030	3,625,000	5.00	1.86*	575896 TX3	2039	5,630,000	5.00	2.29*	575896 UG8

$32,655,000 5.00% Term Bonds due July 1, 2044; Yield 2.43%*; CUSIP[†]: 575896 UH6
$16,200,000 5.00% Term Bonds due July 1, 2049; Yield 2.48%*; CUSIP[†]: 575896 UJ2
$41,175,000 3.00% Term Bonds due July 1, 2049; Yield 3.10%; CUSIP[†]: 575896 UK9

$297,365,000
Revenue Bonds, Series 2019-C (AMT)

Maturity (July 1)	Amount	Interest Rate	Yield	CUSIP[†]	Maturity (July 1)	Amount	Interest Rate	Yield	CUSIP[†]
2020	$1,110,000	3.00%	1.31%	575896 UL7	2030	$7,635,000	5.00%	2.11%*	575896 UW3
2021	1,200,000	3.00	1.37	575896 UM5	2031	8,020,000	5.00	2.16*	575896 UX1
2022	2,530,000	4.00	1.41	575896 UN3	2032	8,420,000	5.00	2.22*	575896 UY9
2023	5,430,000	5.00	1.47	575896 UP8	2033	8,840,000	5.00	2.27*	575896 UZ6
2024	5,690,000	5.00	1.56	575896 UQ6	2034	9,280,000	5.00	2.32*	575896 VA0
2025	5,985,000	5.00	1.66	575896 UR4	2035	9,745,000	5.00	2.37*	575896 VB8
2026	6,280,000	5.00	1.75	575896 US2	2036	10,235,000	5.00	2.42*	575896 VC6
2027	6,595,000	5.00	1.84	575896 UT0	2037	10,750,000	5.00	2.46*	575896 VD4
2028	6,920,000	5.00	1.93	575896 UU7	2038	11,275,000	5.00	2.50*	575896 VE2
2029	7,275,000	5.00	2.02	575896 UV5	2039	11,840,000	5.00	2.54*	575896 VF9

$52,480,000 5.00% Term Bonds due July 1, 2044; Yield 2.67%*; CUSIP[†]: 575896 VG7
$99,830,000 5.00% Term Bonds due July 1, 2049; Yield 2.72%*; CUSIP[†]: 575896 VH5

* Priced at the stated yield to the July 1, 2029 optional redemption date at a redemption price of 100%.

No dealer, broker, salesperson or other person has been authorized by the Authority or any of its agents or the Underwriters to give any information or to make any representations other than those contained in this Official Statement, and, if given or made, such other information or representations must not be relied upon as having been authorized by any of the foregoing. This Official Statement does not constitute an offer to sell or the solicitation of an offer to buy nor shall there be any sale of the 2019 Bonds by any person in any jurisdiction in which it is unlawful for such person to make such offer, solicitation or sale. The information set forth herein has been furnished by the Authority and The Depository Trust Company and includes information from other sources that are believed to be reliable but, as to information from sources other than the Authority, is not to be construed as a representation of the Authority. The information and expressions of opinion contained herein are subject to change without notice and neither the delivery of this Official Statement nor any sale made hereunder shall, under any circumstances, create any implication that there has been no change in the affairs of the Authority since the date hereof.

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

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

IN CONNECTION WITH THIS OFFERING, THE UNDERWRITERS MAY OVER-ALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE 2019 BONDS AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.

TABLE OF CONTENTS

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OFFICIAL STATEMENT

of the

MASSACHUSETTS PORT AUTHORITY

Relating to its

$157,680,000 Revenue Bonds, Series 2019-B (Non-AMT)
$297,365,000 Revenue Bonds, Series 2019-C (AMT)

INTRODUCTION

General

This Official Statement of the Massachusetts Port Authority (the "*Authority*") sets forth certain information concerning the Authority and its $157,680,000 Revenue Bonds, Series 2019-B (Non-AMT) (the "*2019-B Bonds*") and $297,365,000 Revenue Bonds, Series 2019-C (AMT) (the "*2019-C Bonds,*" and together with the 2019-B Bonds, the "*2019 Bonds*").

The Authority

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

The 2019 Bonds

The 2019 Bonds are to be issued under and pursuant to the Enabling Act, a Trust Agreement by and between the Authority and U.S. Bank National Association (successor-in-interest to State Street Bank and Trust Company), as trustee (the "*Trustee*"), dated as of August 1, 1978, as amended and supplemented (the "*1978 Trust Agreement*"), and a resolution of the Authority pertaining to the issuance of the 2019 Bonds (the "*Bond Resolution*") adopted by the Authority on June 20, 2019. The 2019 Bonds are being issued to finance (i) certain capital improvements and related costs, including capitalized interest thereon, (ii) the Reserve Requirement applicable to the 2019 Bonds and (iii) costs of issuing the 2019 Bonds. See "PLAN OF FINANCE," "SECURITY FOR THE 2019 BONDS – Reserve Account" and APPENDIX A – Information Statement of the Authority – Capital Program – Funding Sources.

The 2019 Bonds and the outstanding Bonds that have been previously issued by the Authority under the 1978 Trust Agreement on a parity therewith, and any additional parity Bonds that may be issued hereafter under the 1978 Trust Agreement are collectively referred to herein as the "*Bonds*." For a description of the outstanding Bonds of the Authority and the pledge of Revenues of the Authority under the 1978 Trust Agreement, see "SECURITY FOR THE 2019 BONDS."

Modifications of the 1978 Trust Agreement

By resolution adopted June 23, 2016, the Authority approved the Twenty-first Supplemental Agreement, which provides for certain modifications to the 1978 Trust Agreement (the "*Consent Amendments*"), which will take effect when approved by the holders of not less than 51% of the outstanding Bonds of the Authority. Each initial purchaser of the 2019 Bonds will be required to execute a written consent to the adoption of the Consent Amendments, the form of which is attached to this Official Statement as APPENDIX F – Authority Request for Written Consent to Proposed Amendments. Such consent is irrevocable and shall be binding on the initial purchaser and all successors in interest to such initial purchaser. To date, holders of the Authority's outstanding 2016-A Bonds, 2016-B Bonds, 2017-A Bonds and 2019-A Bonds have consented to the Consent Amendments (see the table entitled "Bonds Outstanding Under the 1978 Trust Agreement" in "SECURITY FOR THE 2019 BONDS – General" for a listing of all Bonds currently outstanding under the 1978 Trust Agreement). Upon receipt by the Authority and the Trustee of the written consent to the Consent Amendments by the initial purchasers of the 2019 Bonds, the Authority expects to have received the required consent of more than 51% of holders of Outstanding Bonds of the Authority, and accordingly, the Consent Amendments are expected to be adopted and become effective as of the date of issuance of the 2019 Bonds. The descriptions of the 1978 Trust Agreement set forth herein are inclusive of the modifications thereto that are made by the Consent Amendments. See "SECURITY FOR THE BONDS – Modifications of the 1978 Trust Agreement" for a further description of the modifications set forth in the Twenty-first Supplemental Agreement.

Additional Information

This Official Statement includes a description of the Authority, its facilities and certain financial and operational factors relating to the Authority, and a description of the 2019 Bonds and the security therefor. Except where noted, all information presented in this Official Statement has been provided by the Authority. The following appendices are included as part of this Official Statement: APPENDIX A – Information Statement of the Authority; APPENDIX B – Financial Statements of the Authority for the fiscal years ended June 30, 2018 and 2017; APPENDIX C – Boston Logan International Airport Market Analysis (the *"Airport Market Analysis*") of ICF, Cambridge, Massachusetts ("*ICF*") dated June 20, 2019; APPENDIX D – Review of Airport Properties Net Revenues Forecasts (the *"Review of Revenue Forecasts"*) of LeighFisher Inc., Burlingame, California (*"LeighFisher")* dated June 20, 2019; APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement; APPENDIX F – Authority Request for Written Consent to Proposed Amendments; APPENDIX G – Form of Continuing Disclosure Certificate; and APPENDIX H – Form of Opinion of Co-Bond Counsel. APPENDIX A has been provided by the Authority. APPENDICES E and F have been prepared by Kaplan Kirsch & Rockwell LLP, Co-Bond Counsel to the Authority. APPENDIX G has been prepared by Locke Lord LLP, Disclosure Counsel to the Authority. APPENDIX H has been prepared by Kaplan Kirsch & Rockwell LLP and Foley & Lardner LLP, Co-Bond Counsel to the Authority.

Certain defined terms that are capitalized but not defined herein are defined in the 1978 Trust Agreement. See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Certain Definitions. All references in this Official Statement to the 1978 Trust Agreement, the Bond Resolution, the 2019 Bonds, the Continuing Disclosure Certificate and all other agreements, statutes and instruments are qualified by reference to the complete document. Copies of the 1978 Trust Agreement and the Bond Resolution are available for examination at the offices of the Authority and the Trustee.

The Authority's principal office is located at One Harborside Drive, Suite 200S, East Boston, Massachusetts 02128-2909. Its telephone number is (617) 568-5000. Questions may be directed to Anna M. Tenaglia, Acting Director of Administration and Finance/Secretary-Treasurer, at atenaglia@massport.com. Copies of certain documents, including the Authority's Comprehensive Annual Financial Report for fiscal year 2018, are available electronically at the investors' page of the Authority's website at:

http://www.massport.com/massport/finance/investor-relations

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

THE 2019 BONDS

General Provisions

The 2019 Bonds will be issued as fully registered bonds in the aggregate principal amounts as set forth on page (i) hereof, will be dated their date of initial delivery and will bear interest from that date to their respective maturities as set forth on page (i) hereof, subject to optional and mandatory sinking fund redemption prior to maturity as described below. Ownership interests in the 2019 Bonds will be available in denominations of $5,000 and integral multiples thereof. Interest on the 2019 Bonds will be payable on January 1 and July 1 of each year, commencing January 1, 2020.

So long as Cede & Co. is the registered owner of the 2019 Bonds, all payments of principal of, premium, if any, and interest on the 2019 Bonds are payable by wire transfer by the Trustee to Cede & Co., as nominee for DTC, which will, in turn, remit such amounts to the DTC Participants (as defined herein) for subsequent disposition to Beneficial Owners (as defined herein). See "Book-Entry Only Method" below.

Redemption

Sinking Fund Installments. The 2019 Bonds described below will be subject to redemption from sinking fund installments on the dates and in the amounts set forth below, which may be satisfied (i) by purchase and immediate subsequent cancellation by May 15 in each year at not more than 100% (unless another price is set by the Authority) of the principal amount, or (ii) by redemption on July 1 in each year by lot at 100% of the principal amount to be redeemed, in each case together with accrued interest to the purchase or redemption date.

Sinking Fund Installments
2019-B Bonds Maturing July 1, 2044

Year	Principal Amount	Year	Principal Amount
2040	$5,910,000	2043	$6,840,000
2041	6,205,000	2044†	7,185,000
2042	6,515,000		

† Maturity

Sinking Fund Installments
2019-B Bonds Maturing July 1, 2049 (5.00% Coupon)

Year	Principal Amount	Year	Principal Amount
2045	$2,935,000	2048	$3,390,000
2046	3,080,000	2049†	3,560,000
2047	3,235,000		

† Maturity

Sinking Fund Installments
2019-B Bonds Maturing July 1, 2049 (3.00% Coupon)

Year	Principal Amount	Year	Principal Amount
2045	$7,450,000	2048	$8,625,000
2046	7,820,000	2049†	9,065,000
2047	8,215,000		

† Maturity

Sinking Fund Installments
2019-C Bonds Maturing July 1, 2044

Year	Principal Amount	Year	Principal Amount
2040	$9,500,000	2043	$10,990,000
2041	9,975,000	2044†	11,545,000
2042	10,470,000		

† Maturity

Sinking Fund Installments
2019-C Bonds Maturing July 1, 2049

Year	Principal Amount	Year	Principal Amount
2045	$18,065,000	2048	$20,915,000
2046	18,970,000	2049†	21,960,000
2047	19,920,000		

† Maturity

Optional Redemption. The 2019 Bonds maturing on or prior to July 1, 2029 will not be subject to optional redemption prior to their respective maturity dates. The 2019 Bonds maturing after July 1, 2029 will be redeemable at the option of the Authority, in the order of maturity or sinking fund installments as directed by the Authority, on or after July 1, 2029, in whole or in part on any date, by lot within any single maturity or sinking fund installment of a Series, at 100% of the principal amount to be redeemed, together with accrued interest to the purchase or redemption date.

Selection of 2019 Bonds to Be Redeemed. If fewer than all the 2019 Bonds of any maturity or sinking fund installment and interest rate of a Series are to be redeemed, the Trustee will select the 2019 Bonds of such maturity and interest rate or sinking fund installment and interest rate of a Series to be redeemed by lot; provided, however, that so long as DTC or its nominee is the Bondholder, the particular portions of the 2019 Bonds of a Series to be redeemed within a maturity or sinking fund installment and interest rate shall be selected by DTC in such manner as DTC may determine. For this purpose, each 2019 Bond of a Series in a denomination larger than the minimum Authorized Denomination permitted by the Bond Resolution at the time will be considered to be separate 2019 Bonds of such Series each in the minimum Authorized Denomination.

Notice of Redemption. During the period that DTC or DTC's partnership nominee is the registered owner of the 2019 Bonds, the Trustee shall not be responsible for mailing notices of redemption to the Beneficial Owners (as defined herein) of the 2019 Bonds. See "Book-Entry Only Method" below. Not less than 30 nor more than 60 days before any redemption date, notice of the redemption will be filed with the Paying Agents of the 2019 Bonds and mailed to the holders of the 2019 Bonds (DTC or DTC's partnership nominee, as long as the 2019 Bonds are so registered) to be redeemed in whole or in part at their address as shown on the registration books of the Trustee. Failure to mail any notice of redemption, however, will not affect the validity of the proceedings for such redemption. If at the time of notice of any optional redemption of 2019 Bonds moneys sufficient to redeem all of such 2019 Bonds shall not have been deposited or set aside as provided in the 1978 Trust Agreement, then the notice of redemption may state that it is conditional on the deposit of sufficient moneys by not later than one business day prior to the redemption date, and if the deposit is not timely made the notice shall be of no effect. The Trustee may make other arrangements with respect to the manner of giving notices of redemption to Bondholders of record or Beneficial Owners of the 2019 Bonds, as provided in the Bond Resolution.

Book-Entry Only Method

The Depository Trust Company ("*DTC*"), New York, New York, will act as securities depository for the 2019 Bonds. The 2019 Bonds will be issued in fully-registered form registered in the name of Cede & Co. (DTC's partnership nominee) or such other name as may be requested by an authorized representative of DTC. One-fully registered certificate will be issued for each maturity and interest rate of each Series of the 2019 Bonds, each in the aggregate principal amount of such maturity and interest rate, and each such certificate will be deposited with DTC.

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

Purchases of 2019 Bonds deposited with DTC must be made by or through Direct Participants, which will receive a credit for such 2019 Bonds on DTC's records. The ownership interest of each actual purchaser of each 2019 Bond deposited with DTC ("*Beneficial Owner*") is in turn to be recorded on the Direct and Indirect Participants' records. Beneficial Owners will not receive written confirmation from DTC of their purchase. Beneficial Owners are, however, expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in 2019 Bonds deposited with DTC are to be accomplished by entries made on the books of Direct and Indirect Participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in 2019 Bonds deposited with DTC, except in the event that use of the book-entry system for such 2019 Bonds is discontinued.

To facilitate subsequent transfers, all 2019 Bonds deposited by Direct Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co., or such other name as may be requested by an authorized representative of DTC. The deposit of 2019 Bonds with DTC and their registration in the name of Cede & Co. or such other DTC nominee do not effect any change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of the 2019 Bonds deposited with it; DTC's records reflect only the identity of the Direct Participants to whose accounts such 2019 Bonds are credited, which may or may not be the Beneficial Owners. The Direct and Indirect Participants will remain responsible for keeping account of their holdings on behalf of their customers.

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

Redemption notices shall be sent to DTC. If less than all of the 2019 Bonds of a particular Series, interest rate and maturity is being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such maturity to be redeemed.

Neither DTC nor Cede & Co. (nor such other DTC nominee) will consent or vote with respect to 2019 Bonds deposited with it unless authorized by a Direct Participant in accordance with DTC's MMI Procedures. Under its usual procedures, DTC mails an Omnibus Proxy to the Authority or the Trustee as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts the 2019 Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Principal and interest payments on 2019 Bonds deposited with DTC will be made to Cede & Co., or such other nominee as may be requested by an authorized representative of DTC. DTC's practice is to credit Direct Participants' accounts upon DTC's receipt of funds and corresponding detail information from the Authority or the Trustee, on the payable date in accordance with their respective holdings shown on DTC's records. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with 2019 Bonds held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participant and not of DTC (nor its nominee), the Authority or the Trustee, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of principal and interest to Cede & Co. (or such other nominee as may be requested by an authorized representative of DTC) is the responsibility of the Authority or the Trustee, disbursement of such payments to Direct Participants will be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners will be the responsibility of Direct and Indirect Participants.

DTC may discontinue providing its services as depository with respect to 2019 Bonds held by it at any time by giving reasonable notice to the Authority or the Trustee. Under such circumstances, in the event that a successor depository is not obtained, physical certificates are required to be printed and delivered to Beneficial Owners.

The Authority may decide to discontinue use of the system of book-entry transfers through DTC (or a successor securities depository). In that event, 2019 Bond certificates will be printed and delivered to DTC.

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

So long as Cede & Co. is the registered owner of the 2019 Bonds as nominee of DTC, references herein to the holders or registered owners of the 2019 Bonds shall mean Cede & Co. and shall not mean the Beneficial Owners of the 2019 Bonds.

Neither the Authority nor the Trustee will have any responsibility or obligation to the Participants of DTC or the persons for whom they act as nominees with respect to (i) the accuracy of any records maintained by DTC or by any Participant of DTC, (ii) payments or the providing of notice to the Direct Participants, the Indirect Participants or the Beneficial Owners, (iii) the selection by DTC or by any Participant of DTC of any Beneficial Owner to receive payment in the event of a partial redemption of the 2019 Bonds or (iv) any other action taken by DTC or its partnership nominee as owner of the 2019 Bonds.

Transfer of 2019 Bonds

So long as Cede & Co., as nominee for DTC (or other nominee of DTC), is the Bondholder of record of the 2019 Bonds, beneficial ownership interests in the 2019 Bonds may be transferred only through a Direct Participant or Indirect Participant and recorded on the book-entry system operated by DTC. In the event the book-entry-only system is discontinued, 2019 Bond certificates will be delivered to the Beneficial Owners as described in the Bond Resolution. Thereafter, the 2019 Bonds, upon surrender thereof at the principal office of the Trustee with a written instrument of transfer satisfactory to the Trustee, duly executed by the holder thereof or such holder's duly authorized attorney, may be exchanged for an equal aggregate principal amount of 2019 Bonds of the same series and maturity and of any Authorized Denominations.

In all cases in which the privilege of exchanging or transferring 2019 Bonds is exercised, the Authority shall execute and the Trustee shall authenticate and deliver the 2019 Bonds in accordance with the provisions of the 1978 Trust Agreement. For every such exchange or transfer of 2019 Bonds, the Authority or the Trustee may make a charge sufficient to reimburse it for any tax, fee or other governmental charge required to be paid with respect to such exchange or transfer but may impose no other charge therefor. Neither the Authority nor the Trustee shall be required to make any such exchange or transfer of 2019 Bonds during the 15 days next preceding an Interest Payment Date or, in the case of any proposed redemption, during the 15 days next preceding the first publication or mailing of notice of redemption.

ESTIMATED SOURCES AND USES OF FUNDS

The estimated sources and uses of funds in connection with the issuance of the 2019 Bonds are summarized below:

	2019-B	2019-C	Total
Sources of Funds			
Principal of the 2019 Bonds	$157,680,000.00	$297,365,000.00	$455,045,000.00
Plus: Net Original Issue Premium	26,765,911.25	62,370,974.50	89,136,885.75
Total	$184,445,911.25	$359,735,974.50	$544,181,885.75
Uses of Funds			
Deposit to Construction Fund for Project Costs	$155,247,000.00	$270,135,000.00	$425,382,000.00
Deposit to Construction Fund for Capitalized Interest	19,060,921.67	28,494,975.56	47,555,897.23
Deposit to Note Payment Account of Improvement and Extension Fund	--	42,000,000.00	42,000,000.00
Deposit to Pooled Reserve Subaccount	9,278,367.29	17,497,854.46	26,776,221.75
Costs of Issuance[1]	395,402.01	737,919.15	1,133,321.16
Underwriters' Discount	464,220.28	870,225.33	1,334,445.61
Total	$184,445,911.25	$359,735,974.50	$544,181,885.75

[1] Includes Trustee fees, the Authority's legal fees, rating agency fees, printing expenses and other miscellaneous fees and expenses.

PLAN OF FINANCE

The 2019 Bonds are being issued to finance a portion of the Authority's FY19-FY23 Capital Program. The FY19-FY23 Capital Program includes forecasted total expenditures of approximately $2.6 billion by the Authority and approximately $1.8 billion by third-party or non-recourse funding sources for ongoing projects and for projects to be commenced during the five-year program period, for a total of approximately $4.4 billion. The size of the FY19-FY23 Capital Program is a response to the growth in passengers at Logan Airport, as well as the accelerated growth in container volume at the Port, which has prompted the need to undertake projects sooner than anticipated in the Plan to facilitate the increase in demand.

The Authority-funded portion of the FY19-FY23 Capital Program is funded from a variety of sources, including Bond proceeds, grants, passenger facility charges ("*PFCs*"), Customer Facility Charges ("*CFCs*") and pay-as-you-go capital. The Authority's financing plan assumes the issuance of the 2019 Bonds to fund $467.4 million of projects costs (of which $436.3 million is expected to be expended during fiscal years 2019 through 2023, and $31.1 million is planned to be used to reimburse expenditures made prior to fiscal year 2019). These projects include Phase 1 of Terminal E modernization, improvements to the roadways between Terminal B and Terminal C, the optimization of Terminal B, Terminal C optimization and construction of a secure connection between Terminal B and Terminal C, improvements to Terminal C curbside space and canopy, and the construction of a new Berth 10 and the acquisition of cranes at Conley Terminal. See APPENDIX A – Information Statement of the Authority – Capital Program, for a more detailed description of the FY19-FY23 Capital Program, including estimated funding sources and a summary of uses, as well as a more detailed description of the projects expected to be financed with proceeds of the 2019 Bonds.

A portion of the Authority's FY19-FY23 Capital Program has been financed to date by the Authority with proceeds of its Tax Exempt Commercial Paper Notes, Series 2012-B (the "*Notes*"), currently outstanding in the amount of $42.0 million. The Authority expects to use a portion of the proceeds of the 2019-C Bonds to repay and redeem $42.0 million of the currently outstanding Notes on or shortly after the date of issuance of the 2019 Bonds.

SECURITY FOR THE 2019 BONDS

General

The principal of, premium, if any, and interest on the 2019 Bonds and each of the 2008 Bonds, the 2010 Bonds, the 2012 Bonds, the 2014 Bonds, the 2015 Bonds, the 2016 Bonds, the 2017 Bonds and the 2019-A Bonds (each as described in the table below) and any additional Bonds that may be issued hereafter under the 1978 Trust Agreement, are payable from, and secured by a pledge of, the Authority's Revenues, which include all tolls, rates, fees, rentals and other charges from its Projects (subject to limited exclusions) and certain investment income and other revenues, all as more fully described in APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement. For information about historical Revenues, see APPENDIX A – Information Statement of the Authority – Selected Financial Data. The pledge of the Revenues is subject to the provisions of the 1978 Trust Agreement regarding the application of Revenues. See "Flow of Funds" below. Exclusions from Revenues pledged to secure the Bonds include (i) PFCs assessed by the Authority on eligible enplaning passengers at the Airport, (ii) CFCs charged to rental car patrons and (iii) certain revenues derived from facilities financed by debt that has limited recourse to the Authority. See below under "Other Revenues of the Authority Not Pledged as Security for the Bonds – Passenger Facility Charges" and "– Customer Facility Charges" and APPENDIX A – Information Statement of the Authority – Other Obligations – PFC Revenue Bonds, – CFC Revenue Bonds and – Special Facilities Revenue Bonds. While PFCs are specifically excluded from Revenues, they may be applied to pay principal of and interest on Bonds as described herein. See "SECURITY FOR THE 2019 BONDS – Use of Available Funds to Pay Debt Service" below for a discussion of the Authority's expectation to use PFCs to pay a portion of the debt service on the 2019-C Bonds and certain other Bonds of the Authority.

As of the date of this Official Statement, before giving effect to the issuance of the 2019 Bonds, the Authority has outstanding under the 1978 Trust Agreement 15 Series of Bonds in the aggregate principal amount of $1,624,750,000, consisting of the Series listed in the following table.

BONDS OUTSTANDING UNDER THE 1978 TRUST AGREEMENT BEFORE GIVING EFFECT TO THE ISSUANCE OF THE 2019 BONDS

Series	Issued	Amount Outstanding
Revenue Refunding Bonds, Series 2008-C (Non-AMT)	July 2008	$1,305,000
Revenue Bonds, Series 2010-A (Non-AMT)	August 2010	83,500,000
Revenue Refunding Bonds, Series 2010-B (Non-AMT)	August 2010	115,575,000
Revenue Bonds, Series 2012-A (AMT)	July 2012	87,155,000
Revenue Refunding Bonds, Series 2012-B (Non-AMT)	July 2012	142,225,000
Revenue Bonds, Series 2014-A (Non-AMT)	July 2014	42,910,000
Revenue Bonds, Series 2014-B (AMT)	July 2014	45,560,000
Revenue Refunding Bonds, Series 2014-C (Non-AMT)	July 2014	124,430,000
Revenue Bonds, Series 2015-A (Non-AMT)	July 2015	102,570,000
Revenue Bonds, Series 2015-B (AMT)	July 2015	65,780,000
Revenue Refunding Bonds, Series 2015-C (Non-AMT)	June 2015	116,625,000
Revenue Refunding Bonds, Series 2016-A (Non-AMT)	July 2016	47,060,000
Revenue Bonds, Series 2016-B (AMT)	July 2016	180,285,000
Revenue Bonds, Series 2017-A (AMT)	July 2017	157,840,000
Revenue Bonds, Series 2019-A (AMT)	February 2019	311,930,000
Total		$1,624,750,000

The Bonds on the foregoing list are the only Bonds currently outstanding under the 1978 Trust Agreement. All of the currently outstanding Bonds are fixed rate bonds. See Note 5 to the Authority's financial statements attached hereto as APPENDIX B for more information about the Authority's bonds and notes payable as of June 30, 2018. For a description of the Authority's subordinated obligations, also issued under the 1978 Trust Agreement but not on parity with the Bonds, including its Subordinated Obligations, Series 2018A (the "*Series 2018 Subordinated Obligations*"), which were issued on November 20, 2018, see APPENDIX A – Information Statement of the Authority – Other Obligations – Subordinated Indebtedness. For a description of other obligations of the Authority not issued on parity with the Bonds, see APPENDIX A – Information Statement of the Authority – Other Obligations.

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

Flow of Funds

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

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

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

(a) First, to deposit to the credit of the Bond Service Account of the Interest and Sinking Fund, the amount required to make the balance of the Bond Service Account equal to the sum of the interest accrued and to accrue until the first day of the next month on all outstanding Bonds and the principal accrued and to accrue until the first day of the ensuing month of all serial Bonds, if any, which will become payable within the next twelve (12) months, less the amount of Available Funds (defined herein) irrevocably committed by the Authority by resolution or held by the Trustee and set aside exclusively for the payment of principal of, interest or premium, if any, on specified Bonds. See "SECURITY FOR THE 2019 BONDS – Use of Available Funds to Pay Debt Service" herein.

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

(c) Third, to deposit to the credit of the Reserve Account of the Interest and Sinking Fund, the amount necessary to make the amount on deposit therein equal to the Reserve Requirement, provided, however that the Authority may elect to fully fund the applicable subaccount in the Reserve Account over a period not to exceed sixty (60) months. See "SECURITY FOR THE 2019 BONDS – Reserve Account" herein.

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

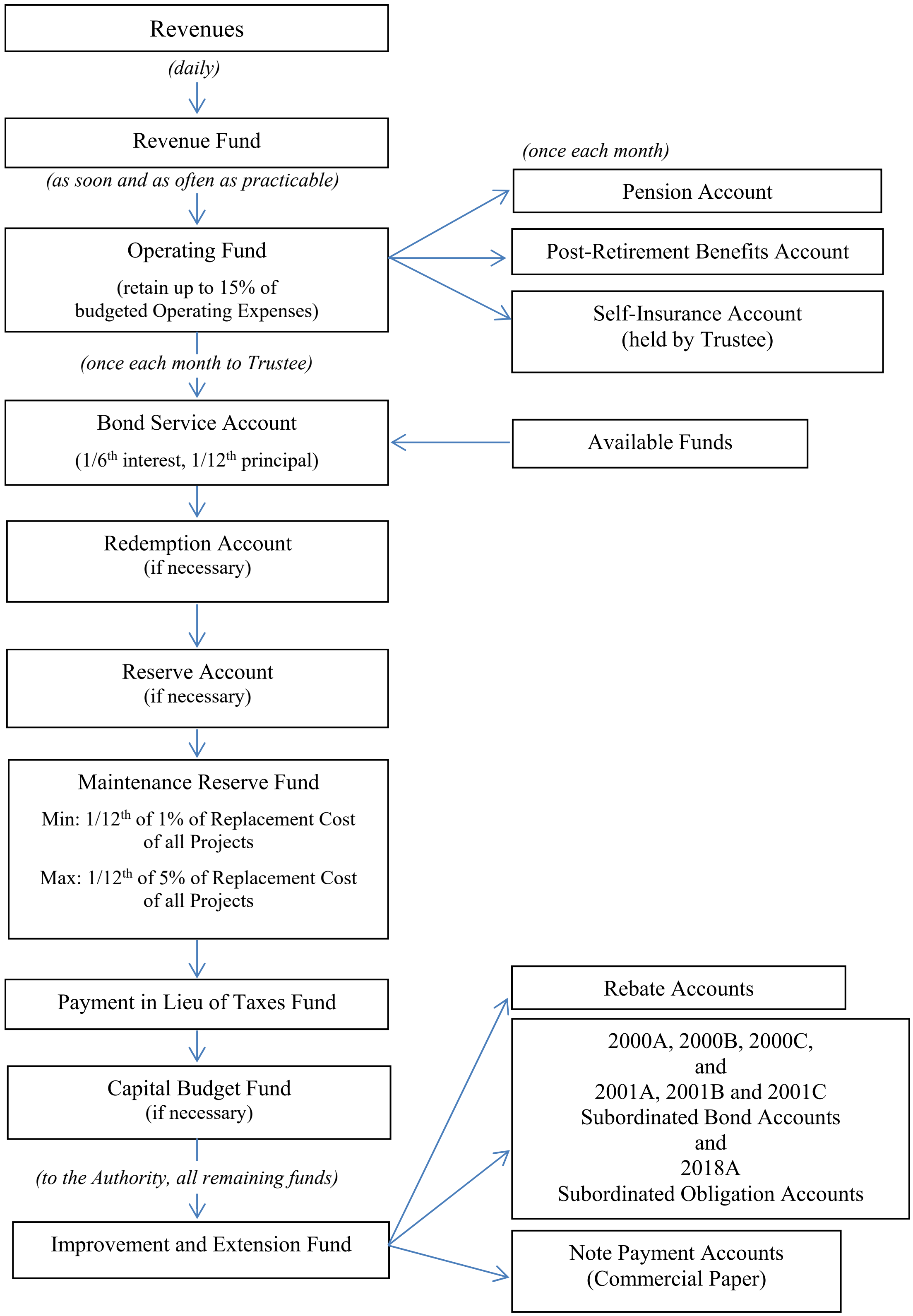
(e) Fifth, to deposit to the credit of the Payment in Lieu of Taxes Fund, the amount, if any, required to make the balance of the Payment in Lieu of Taxes Fund equal to the amount that should be on deposit therein, assuming that the amounts payable on the respective next following payment dates pursuant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

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

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

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

APPLICATION OF REVENUES



Use of Available Funds to Pay Debt Service

Pursuant to the Consent Amendments, which are expected to be effective upon issuance of the 2019 Bonds, the Authority may approve a resolution or resolutions that shall specify whether and to what extent any Available Funds, will either (i) be pledged to secure or be irrevocably committed to or (ii) be included in the definition of Revenues and, in either case, be used to pay principal of, premium, if any, and interest on such Series of Bonds. The term "*Available Funds*" shall mean for any period of time, (i) the amount of PFCs and/or CFCs to be received by the Authority during such period and not previously pledged or irrevocably committed to payment of principal of, interest on or premium, if any, on a Series of Bonds, and (ii) the amount of any other future income or revenue source not then included in the definition of "Revenues" that the Authority designates as "Available Funds" in a future resolution adopted by the Authority supplementing the 1978 Trust Agreement. The Authority may designate specified PFC revenues as Available Funds. Available Funds are transferred to the Trustee monthly and deposited directly into an Authority designated Bond Service Account to be used to pay debt service on a specific Series of Bonds. The Authority has not elected, and the Authority has no current plans to elect, to designate any Available Funds to be included in the definition of Revenues. The Authority expects, however, to the extent approved by the FAA, to designate in each annual budget certain PFCs as Available Funds to pay a portion of the debt service on the Authority's recently issued Revenue Bonds, Series 2019-A (the "*2019-A Bonds*") and the 2019-C Bonds, as further described below. Debt service to be paid with PFCs that have been designated as Available Funds will not be included in the calculation of the rate covenant set forth in the 1978 Trust Agreement.

The current capital program assumes that the Authority will issue additional debt that will be paid with PFCs that will be designated as Available Funds to finance $254.9 million of project costs, including $42.0 million of project costs to be paid with proceeds of the 2019-C Bonds. See APPENDIX A – Information Statement of the Authority – Capital Program – Funding Sources – Passenger Facility Charges. The Authority received FAA approval to pay a portion of the debt service on the 2019-A Bonds and the 2019-C Bonds with PFCs, and expects to authorize the irrevocable application of PFCs annually to pay a portion of the principal of and interest on the 2019-A Bonds and the 2019-C Bonds, but no assurance can be given that the Authority will receive FAA approval to pay a portion of the debt service on future Bonds with PFCs, or that it will, in any future fiscal year, irrevocably allocate PFCs for such purpose. See APPENDIX A – Information Statement of the Authority under the headings "Capital Programs – Funding Sources – Future Bond Proceeds" and "Management's Discussion of Forecast Assumptions."

Covenants as to Fees and Charges

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

Pursuant to the Consent Amendments, which are expected to be effective upon issuance of the 2019 Bonds, for purposes of the calculation of the debt service requirements on all outstanding Bonds, any "Principal and Interest Requirements" (as defined in the 1978 Trust Agreement) on outstanding Bonds will be reduced by the amount of Available Funds that have been irrevocably committed or are held by the Trustee or another fiduciary and are to be set aside exclusively to be used to pay principal of, interest or premium, if any, on specified Bonds pursuant to a resolution of the Authority (and are not otherwise required for payment of another Series of Bonds). See "SECURITY FOR THE BONDS – Use of Available Funds to Pay Debt Service" and "SECURITY FOR THE BONDS – Modifications of the 1978 Trust Agreement" herein.

Reserve Account

The 1978 Trust Agreement establishes a Reserve Account within the Interest and Sinking Fund that secures all Bonds that are currently outstanding on a parity basis. Upon the issuance of the 2019 Bonds and the Consent Amendments becoming effective, the Authority will establish a Pooled Reserve Subaccount within the Reserve Account and transfer all funds then held in the Reserve Account to the Pooled Reserve Subaccount. On the effective date of the Consent Amendments, the Pooled Reserve Subaccount will secure all outstanding Bonds and any additional Bonds the Authority elects to participate in the Pooled Reserve Subaccount on a parity basis. In the Bond Resolution, the Authority has elected to have the 2019 Bonds participate in the Pooled Reserve Subaccount. Such Pooled Reserve Subaccount shall be used to pay debt service on the Bonds secured thereby to the extent of deficiencies in the applicable Bond Service Account. The Bonds currently outstanding under the 1978 Trust Agreement, the 2019 Bonds and any additional Bonds the Authority elects to have participate in the Pooled Reserve Subaccount are collectively referred to in this Official Statement as the "*Pooled Reserve Subaccount Participating Bonds*."

Pursuant to the Consent Amendments, there may be created within the Reserve Account by the resolution of the Authority authorizing a Series of Bonds a separate subaccount for such Series of Bonds; provided that (i) the Authority may elect in such resolution that any then-existing subaccount within the Reserve Account (including without limitation the Pooled Reserve Subaccount) shall secure such additional Series of Bonds on a parity basis; and (ii) with respect to any Series of Bonds, the Authority may elect in the resolution that such Series of Bonds shall not be secured by any subaccount in the Reserve Account and, accordingly, not to establish any subaccount in the Reserve Account to secure such Series of Bonds. Any resolution of the Authority providing for the issuance of a Series of Bonds that establishes a separate subaccount within the Reserve Account shall specify (a) whether such subaccount shall secure only such Series of Bonds or may secure additional Series of Bonds and (b) the Reserve Requirement (as defined below) applicable to such subaccount.

The Consent Amendments also permit the Authority to determine whether to fully fund a subaccount in the Reserve Fund at the time of issuance of a Series of Bonds or to fully fund the Reserve Requirement over a period of time. In particular, the Authority may elect, by the resolution of the Authority authorizing issuance of a Series of Bonds, to fully fund the applicable subaccount in the Reserve Account over a period specified in such resolution, not to exceed sixty (60) months, commencing with the next succeeding fiscal year of the Authority, during which it shall make substantially equal monthly installments in order that the amounts on deposit therein at the end of such period shall equal the Reserve Requirement for such Series of Bonds.

The term "Reserve Requirement" means (a) with respect to the Pooled Reserve Subaccount, the maximum annual Principal and Interest Requirements on all of the outstanding Bonds secured by the Pooled Reserve Subaccount, and (b) with respect to each Series of Bonds issued on and after the effective date of the Consent Amendments and not secured by the Pooled Reserve Subaccount, as of any date of calculation for a particular subaccount within the Reserve Account other than the Pooled Reserve Subaccount, the amount of money, if any, required by the resolution adopted by the Authority authorizing the issuance of such Series of Bonds to be maintained in a subaccount in the Reserve Account with respect to such Series of Bonds, which amount shall be available for use only with respect to such Series of Bonds.

As a result of the deposits previously made to the Reserve Account upon the issuance of Bonds under the 1978 Trust Agreement, plus subsequent monthly deposits, the balance in the Reserve Account as of March 31, 2019 was approximately $137.5 million. The balance in the Reserve Account is currently held in cash and Investment Securities (as that term is defined in the 1978 Trust Agreement). It is the Authority's policy to fund its reserve funds with cash, cash equivalents and Investment Securities; the Authority has not used any surety policies to fund the Reserve Account. Upon the issuance of the 2019 Bonds and the Consent Amendments becoming effective, the Authority will transfer all funds then held in the Reserve Account to the Pooled Reserve Subaccount. Upon issuance of any additional Pooled Reserve Subaccount Participating Bonds (other than certain refunding Bonds), the 1978 Trust Agreement requires that there be deposited to the Pooled Reserve Subaccount an amount at least equal to one-half of the difference between (a) the amount of the increase in the maximum annual debt service requirement on such Pooled Reserve Subaccount Participating Bonds and all then-outstanding Pooled Reserve Subaccount Participating Bonds and (b) the amount, if any, in the Pooled Reserve Subaccount in excess of the maximum annual debt service requirement on all then-outstanding Pooled Reserve Subaccount Participating Bonds.

The Reserve Requirement applicable to the 2019 Bonds will be funded with proceeds of the 2019 Bonds. At the time of issuance of the 2019 Bonds, the Pooled Reserve Subaccount is expected to be fully funded with respect to all outstanding Pooled Reserve Subaccount Participating Bonds (including the 2019 Bonds). See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Application of Revenues.

Permitted Investments

Moneys held for the credit of the funds and accounts established under the 1978 Trust Agreement may, with certain exceptions, be invested only in "Investment Securities" as defined in the 1978 Trust Agreement. See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Certain Definitions. The exceptions are that moneys held for the credit of any special separate pension account in the Operating Fund may be invested in such manner as provided in the resolution of the Authority establishing such account, and that moneys held for the credit of certain other accounts may be invested solely in Government Obligations. See APPENDIX E – Summary of Certain Provisions of the 1978 Trust Agreement – Investments in Funds and Accounts. For a description of the Authority's investment policy, see APPENDIX A – Information Statement of the Authority – General Operational Factors – Investment Policy.

Additional Bonds

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

In connection with the issuance of the 2019 Bonds, the following test will be applicable: that the Net Revenues of the Authority (the excess of Revenues over Operating Expenses during the applicable period) for any 12 consecutive months of the last 18 months have been at least 125% of the maximum annual Principal and Interest Requirements on all Outstanding Bonds, after giving effect to the issuance of the 2019 Bonds (and any subsequent additional Bonds estimated to be issued under the 1978 Trust Agreement to complete Additional Improvements or Additional Facilities partially financed by Bonds now Outstanding). For the purpose of this calculation, annual Principal and Interest Requirements on Outstanding Bonds means, for any fiscal year of the Authority, interest accrued on such Bonds during such fiscal year, excluding interest for such period paid or to be paid from the Construction Fund, and maturing principal and mandatory amortization requirements due and payable on the July 1 immediately following such fiscal year. In the case of Bonds that bear interest at a variable rate, the interest component of maximum annual Principal and Interest Requirements is computed at the rate estimated by a nationally known investment banking firm selected by the Authority as the rate at which such Bonds would bear interest if issued at par with a fixed rate of interest and the same maturity.

Coverage for purposes of the additional Bonds test described in the preceding paragraph was 190%, based upon (i) Net Revenues for the 12 months ended March 31, 2019 of $424.9 million and (ii) maximum annual Principal and Interest Requirements of approximately $223.4 million, determined as described above, after giving effect to the issuance of the 2019 Bonds and the expected issuance of additional Bonds to complete Additional Improvements partially funded with the 2019 Bonds.

Pursuant to the Consent Amendments, which are expected to be effective upon issuance of the 2019 Bonds, the additional Bonds test will be modified to provide that the principal, interest and/or premium to be paid from

Available Funds that have been irrevocably committed or are held by the Trustee or another fiduciary and are to be set aside exclusively to be used to pay principal of, interest or premium, if any, on specified Bonds pursuant to a resolution of the Authority (and are not otherwise required for payment of another Series of Bonds), or from earnings thereon, shall be disregarded and not included in calculating Principal and Interest Requirements. In particular, for purposes of the additional Bonds test, the annual Principal and Interest Requirements on Outstanding Bonds shall mean (new language <u>underscored</u>), for any fiscal year of the Authority, interest accrued on such Bonds during such fiscal year, excluding interest for such period paid or to be paid from the Construction Fund, and maturing principal and mandatory amortization requirements due and payable on the July 1 immediately following such fiscal year<u>, excluding principal, interest and/or premium to be paid from Available Funds or earnings thereon</u>. See "SECURITY FOR THE 2019 BONDS – Use of Available Funds to Pay Debt Service."

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

Passenger Facility Charges. Under the 1978 Trust Agreement, PFCs assessed by the Authority on eligible enplaning passengers at the Airport have been excluded from Revenues at the election of the Authority, and the proceeds of PFCs are collected, held and expended outside the Funds and Accounts established under the 1978 Trust Agreement, and are not security for the Bonds. See APPENDIX A – Information Statement of the Authority – Capital Program – Funding Sources. As described under the subheading "– Use of Available Funds to Pay Debt Service" above, however, pursuant to the Consent Amendments, which are expected to be effective upon issuance of the 2019 Bonds, the Authority may approve a resolution or resolutions that shall specify whether and to what extent any PFCs will either (i) be pledged to secure or be irrevocably committed to or (ii) be included in the definition of Revenues and, in either case, be used to pay principal of, premium, if any, and interest on such Series of Bonds. The Authority expects to authorize the irrevocable application of PFCs annually to pay a portion of the principal of and interest on certain Bonds currently outstanding, as well as Bonds to be issued under the 1978 Trust Agreement in the future.

Customer Facility Charges. In December 2008, the Authority instituted a CFC for each transaction day that a car is rented at Logan Airport. The purpose of the CFC is to fund the evaluation, design, financing and development of the Rental Car Center ("*RCC*") and related facilities at the Airport, which opened in September 2013. On June 8, 2011, the Authority issued its first series of special facilities revenue bonds (the "*CFC Revenue Bonds*") under a Trust Agreement dated as of May 18, 2011 (the "*CFC Trust Agreement*") by and between the Authority and U.S. Bank National Association, as trustee, for the purpose of providing funds sufficient, together with other available funds, to finance the development and construction of the RCC and related improvements. Pursuant to the CFC Trust Agreement, the CFC revenues are pledged as security for the CFC Revenue Bonds, and the CFC revenues are not included in Revenues securing the 2019 Bonds and other Bonds issued under the 1978 Trust Agreement. As described under the subheading "– Use of Available Funds to Pay Debt Service" above, however, pursuant to the Consent Amendments, which are expected to be effective upon issuance of the 2019 Bonds, the Authority may approve a resolution or resolutions that shall specify whether and to what extent any CFCs will either (i) be pledged to secure or be irrevocably committed to or (ii) be included in the definition of Revenues and, in either case, be used to pay principal of, premium, if any, and interest on such Series of Bonds. The Authority currently has no expectation to authorize the irrevocable application of CFCs to pay debt service on Bonds issued under the 1978 Trust Agreement. For a further description of the RCC and the CFC Revenue Bonds, see (i) APPENDIX A – Information Statement of the Authority – Airport Properties – Airport Facilities – Service and Support Facilities and (ii) APPENDIX A – Information Statement of the Authority – Other Obligations – CFC Revenue Bonds. The CFC Revenue Bonds are not issued under or secured by the 1978 Trust Agreement.

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

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

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

Modifications of the 1978 Trust Agreement

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

By resolution adopted June 23, 2016, the Authority approved the Twenty-first Supplemental Agreement, which provides for the Consent Amendments. To date, holders of the Authority's outstanding 2016-A Bonds, 2016-B Bonds, 2017-A Bonds and 2019-A Bonds have consented to the Consent Amendments. Upon receipt by the Authority and the Trustee of the written consent to the Consent Amendments by the initial purchasers of the 2019 Bonds, the Authority expects to have received the required consent of more than 51% of holders of Outstanding Bonds of the Authority, and accordingly, the Consent Amendments are expected to be adopted and become effective as of the date of issuance of the 2019 Bonds. The modifications to the 1978 Trust Agreement set forth in the Twenty-first Supplemental Agreement consist of the following:

- Allowing the Authority to determine that a Series of Bonds issued on or after the date the Twenty-first Supplemental Agreement becomes effective (the "*Effective Date*") (i) shall be secured by the "Pooled Reserve Subaccount" within the Reserve Account on a parity with all Bonds outstanding on the Effective Date and all other Bonds so secured, or (ii) shall be secured by another subaccount within the Reserve Account and the amount required to be held within such subaccount to secure such additional Series of Bonds, or (iii) shall not be secured by a reserve subaccount.

- Providing that "Bullet Maturities" shall be deemed to be amortized over a period of up to 30 years for purposes of calculating "Principal and Interest Requirements" unless such maturity is within 12 months of the date of calculation. "Bullet Maturities" is defined as that portion of any Series of Bonds, 25% or more of the principal of which matures on the same date or within a fiscal year (other than Term Bonds), that matures on a single date or within such fiscal year. If such maturity is within 12 months of the date of calculation, then either (1) such maturity shall be taken into account in such calculation, or (2) upon receipt of a certificate of an authorized officer of the Authority (i) stating that the Authority intends to refinance such maturity, (ii) setting forth the probable terms of such refinancing and (iii) certifying that the debt capacity of the Authority is sufficient to successfully complete such refinancing, such Bullet Maturities shall be assumed to be refinanced in accordance with the probable terms set out in such certificate and such terms shall be used for purposes of calculating Principal and Interest Requirements, provided that such assumption shall be amortized over a term of not more than thirty (30) years from the date of refinancing.

- Providing that if Available Funds shall be pledged or irrevocably committed or are held by the Trustee or another fiduciary and are to be set aside exclusively to be used to pay principal of, interest or premium, if any, on specified Bonds pursuant to a resolution of the Authority (and are not otherwise required for payment of another Series of Bonds), then the principal, interest and/or premium to be paid from such Available Funds or from earnings thereon shall be disregarded and not included in calculating Principal and Interest Requirements.

- Allows the Authority, by adoption of a resolution, to designate as "Revenues" Available Funds in an amount, for the period and subject to such conditions as may be provided by such resolution.

- Creating a new category of Consultant to the Authority and allowing such Consultant to perform certain duties currently delegated to the Authority's Accountants, Consulting Engineers or Airport Consultants. The "Consultant" is defined as any Independent consultant, consulting firm (including the Airport Consultants), engineer (including the Consulting Engineers), architect, engineering firm, architectural firm, accountant or accounting firm (including the Accountants), financial advisory or investment banking firm, or other expert recognized to be well-qualified for work of the character required and retained by the Authority to perform acts and carry out the duties provided for such consultant in the 1978 Trust Agreement, where "Independent" means a firm or individual (a) that does not have any direct financial interest or any material indirect financial interest in the operations of the Authority, other than the payment to be received under a contract for services to be performed, and (b) is not connected with the Authority as an official, officer or employee.

- Substituting notice posted on EMMA for publishing notice of redemption, defeasance, amendment of the 1978 Trust Agreement and resignation or replacement of the Trustee.

- Allowing notice to the Authority or Trustee to be delivered by courier or by hand.

- Permitting payments from the Construction Fund to be made by wire or ACH transfer.

By their acceptance of the 2019 Bonds, the owners thereof agree to all of the terms of the 1978 Trust Agreement as currently in effect and shall be required to execute a written consent to the adoption of the Consent Amendments. Copies of the 1978 Trust Agreement, marked to show the Consent Amendments authorized by the Twenty-first Supplemental Agreement, are available on the Municipal Securities Rulemaking Board's Electronic Municipal Market Access ("*EMMA*") system or from the Authority's Acting Director of Administration & Finance and from the Trustee. See "INTRODUCTION – Additional Information" above.

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

TAX MATTERS

In the opinion of Foley & Lardner LLP, Co-Bond Counsel (*"Foley"*), based on existing laws, regulations, rulings and court decisions, and assuming, among other matters, compliance with certain covenants, as described herein, interest on the 2019 Bonds is excluded from gross income for federal income tax purposes under Section 103 of the Internal Revenue Code of 1986, as amended (the "*Code*"), except for interest on any 2019-C Bond for any period during which such 2019-C Bond is held by a person who is a "substantial user" of facilities financed with the proceeds of the 2019-C Bonds or a "related person" of such a substantial user (within the meaning of Section 147(a) of the Code). In addition, interest on the 2019-B Bonds is not a specific preference item for purposes of the federal alternative minimum tax. Interest on the 2019-C Bonds is a specific preference item for purposes of the federal alternative minimum tax. A copy of the proposed form of the opinion of Foley, as Co-Bond Counsel, is set forth in APPENDIX H.

The Code imposes various restrictions, conditions and requirements relating to the exclusion from gross income for federal income tax purposes of interest on obligations such as the 2019 Bonds. The Authority has covenanted to comply with certain restrictions and requirements designed to assure that the interest on the 2019 Bonds will not be included in gross income for federal income tax purposes. Failure to comply with these covenants may result in such interest being included in gross income for federal income tax purposes, possibly from the original issuance date of the 2019 Bonds. The opinion of Foley assumes compliance with these covenants. Foley has not undertaken to determine (or to inform any person) whether any actions taken (or not taken) or events occurring (or not occurring) after the issuance of the 2019 Bonds may adversely affect the tax status of the interest on the 2019 Bonds. Accordingly, the opinion of Foley is not intended to, and may not, be relied upon in connection with any such actions, events or matters.

The opinion of Foley relies on factual representations made by the Authority and other persons. These factual representations include but are not limited to certifications by the Authority regarding its reasonable expectations regarding the use and investment of bond proceeds. Foley has not verified these representations by independent investigation. Foley does not purport to be an expert in asset valuation and appraisal, financial analysis, financial projections or similar disciplines. Failure of any of these factual representations to be correct may result in interest on the 2019 Bonds being included in gross income for federal income tax purposes, possibly from the original issuance dates of such 2019 Bonds.

Although Foley is of the opinion that interest on the 2019 Bonds is excluded from gross income for federal income tax purposes, the ownership or disposition of, or the accrual or receipt of interest on, the 2019 Bonds may otherwise affect a Beneficial Owner's federal tax liability. The nature and extent of these other tax consequences will depend upon the particular tax status of the Beneficial Owner or the Beneficial Owner's other items of income or deduction. Foley expresses no opinion regarding any such other tax consequences.

Current and future legislative proposals, if enacted into law, clarification of the Code or court decisions may cause interest on the 2019 Bonds to be subject, directly or indirectly, to federal income taxation or otherwise prevent the Beneficial Owners from realizing the full current benefit of the tax status of such interest. For example, from time to time, legislative proposals have been advanced which generally would limit the exclusion from gross income of interest on obligations like the 2019 Bonds to some extent for taxpayers who are individuals and whose income is subject to higher marginal tax rates. Other proposals have been made that could significantly reduce the benefit of, or otherwise affect, the exclusion from gross income of interest on obligations like the 2019 Bonds. The introduction or enactment of any such legislative proposals, clarification of the Code or court decisions may also affect, perhaps significantly, the market price for, or marketability of, the 2019 Bonds. Such future legislation, if enacted, possibly could apply to obligations issued before such legislation is enacted and some or all of the 2019 Bonds possibly could be treated for purposes of such future legislation as issued on one or more dates after the dates of original issuance of the 2019 Bonds. Prospective purchasers of the 2019 Bonds should consult their own tax advisors regarding any pending or proposed federal or state legislation, regulations or litigation, and regarding the impact of future legislation, regulations or litigations, as to which Foley expresses no opinion.

The opinion of Foley speaks only as of its date and is based on current legal authorities, covers certain matters not directly addressed by such authorities, and represents Foley's judgment regarding the proper treatment of the 2019 Bonds for federal income tax purposes. It is not binding on the Internal Revenue Service (the "*IRS*") or the courts, and it is not a guarantee of result. Furthermore, Foley cannot give and has not given any opinion or assurance about the future activities of the Authority or about the effect of changes to the Code, the applicable regulations, the interpretation thereof or the enforcement thereof by the IRS. The Authority has covenanted, however, to comply with the applicable requirements of the Code.

Foley is not obligated to defend the Authority regarding the tax-exempt status of the 2019 Bonds in the event of an examination by the IRS. Under current IRS procedures, the Beneficial Owners and parties other than the Authority would have little, if any, right to participate in an IRS examination of the 2019 Bonds. Moreover, because obtaining judicial review in connection with an IRS examination of tax-exempt bonds is difficult, obtaining independent review of IRS positions with which the Authority legitimately disagrees may not be practicable. Any action of the IRS, including but not limited to selection of the 2019 Bonds for examination, or the course or result of such an examination, or an examination of bonds presenting similar tax issues may affect the market price, or the marketability, of the 2019 Bonds, and may cause the Authority or the Beneficial Owners to incur significant expense.

Payments of interest on tax-exempt obligations, including the 2019 Bonds, are generally subject to IRS Form 1099-INT information reporting requirements. If a Beneficial Owner of a 2019 Bond is subject to backup withholding under those requirements, then payments of interest will also be subject to backup withholding. Those requirements do not affect the exclusion of such interest from gross income for federal income tax purposes.

Original Issue Discount. To the extent the issue price of any respective maturity of the 2019 Bonds is less than the amount to be paid at maturity of such 2019 Bonds (excluding amounts stated to be interest and payable at least annually over the term of such 2019 Bonds), the difference constitutes "original issue discount," the accrual of which, to the extent properly allocable to each Beneficial Owner thereof, is treated as interest on the 2019 Bonds which is excluded from gross income for federal income tax purposes. For this purpose, the issue price of a particular maturity of the 2019 Bonds is the first price at which a substantial amount of such maturity of 2019 Bonds is sold to the public (excluding bond houses, brokers, or similar persons or organizations acting in the capacity of underwriters, placement agents or wholesalers). The original issue discount with respect to any maturity of the 2019 Bonds accrues daily over the term to maturity of such 2019 Bonds on the basis of a constant rate compounded on periodic compounding (with straight-line interpolations between compounding dates). In general, the length of the interval between periodic compounding dates cannot exceed the interval between debt service payments on such 2019 Bonds and must begin or end on the date of such payments. The accruing original issue discount is added to the adjusted basis of such 2019 Bonds to determine taxable gain or loss upon disposition (including sale, redemption, or payment on maturity) of such 2019 Bonds. Beneficial Owners of the 2019 Bonds should consult with their own tax advisors with respect to the tax consequences of ownership of such 2019 Bonds with original issue discount, including the treatment of purchasers who do not purchase such 2019 Bonds in the original offering to the public at the first price at which a substantial amount of such 2019 Bonds are sold to the public.

Premium. 2019 Bonds purchased, whether at original issuance or otherwise, for an amount greater than their principal amount payable at maturity (or, in some cases, at their earlier call date) ("*Tax-Exempt Premium Bonds*") will be treated as having amortizable bond premium. No deduction is allowable for the amortizable bond premium in the case of bonds, like the Tax-Exempt Premium Bonds, the interest on which is excluded from gross income for federal income tax purposes. However, the amount of tax exempt interest received, and a Beneficial Owner's basis in a Tax-Exempt Premium Bond, will be reduced by the amount of amortizable bond premium properly allocable to such Beneficial Owner. Beneficial Owners of Tax-Exempt Premium Bonds should consult their own tax advisors with respect to the proper treatment of amortizable bond premium in their particular circumstances.

State Tax Exemption

In the opinion of Kaplan Kirsch & Rockwell LLP, Co-Bond Counsel ("*Kaplan Kirsch*"), under existing Massachusetts law, the 2019 Bonds, their transfer and the income therefrom (including any profit made on the sale thereof) are exempt from taxation within the Commonwealth. Kaplan Kirsch expresses no opinion as to whether the 2019 Bonds or the interest thereon will be included in the measure of Massachusetts estate and inheritance taxes and certain Massachusetts corporation excise and franchise taxes. Kaplan Kirsch expresses no opinion regarding any other Massachusetts tax consequences, or regarding tax consequences of states other than The Commonwealth of Massachusetts.

ELIGIBILITY FOR INVESTMENT

The Enabling Act provides that the 2019 Bonds are eligible for investment by all Massachusetts insurance companies, trust companies in their commercial departments, banking associations, executors, trustees and other fiduciaries.

RATINGS

The 2019 Bonds have been assigned ratings of "AA" (outlook: stable) by Fitch, Inc. ("*Fitch*"), "Aa2" (outlook: stable) by Moody's Investors Service ("*Moody's*") and "AA" (outlook: stable) by S&P Global Ratings ("*S&P*"), respectively. Such ratings reflect only the respective views of Fitch, Moody's and S&P, and an explanation of the significance of such ratings may be obtained from the rating agency furnishing the same. There is no assurance that such ratings will continue for any given period of time or that they will not be revised or withdrawn entirely by any or all of such rating agencies if, in its or their judgment, circumstances so warrant. Any such downward revision or withdrawal of such ratings may have an adverse effect on the market price of the 2019 Bonds.

FORWARD-LOOKING STATEMENTS

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

CERTAIN LEGAL MATTERS

The unqualified approving opinions of Kaplan Kirsch & Rockwell LLP, Boston, Massachusetts, and Foley & Lardner LLP, Chicago, Illinois, Co-Bond Counsel to the Authority, will be furnished upon delivery of the 2019 Bonds; the proposed forms of such opinions are set forth in APPENDIX H. Certain legal matters will be passed on for the Authority by Catherine M. McDonald, Esquire, its Chief Legal Counsel, and by Locke Lord LLP, Boston, Massachusetts, its Disclosure Counsel. Certain legal matters will be passed on for the Underwriters by their counsel, Hinckley, Allen & Snyder LLP, Boston, Massachusetts.

INDEPENDENT AUDITORS

The financial statements of the Authority as of and for the years ended June 30, 2018 and 2017 included in APPENDIX B of this Official Statement have been audited by Ernst & Young LLP, independent auditors, as stated in their report appearing therein.

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

MARKET ANALYSIS AND REVIEW OF AIRPORT PROPERTIES NET REVENUES

The Airport Market Analysis set forth in APPENDIX C was prepared by ICF in connection with the issuance of the 2019 Bonds. Such report is set forth herein in reliance upon the knowledge and experience of such firm as airport consultants. ICF has consented to the inclusion of their report herein.

The Review of Airport Properties Net Revenues Forecasts set forth in APPENDIX D was prepared by LeighFisher in connection with the issuance of the 2019 Bonds. The review should be read in its entirety for an understanding of the forecasts and the key assumptions therein. Such review is set forth herein in reliance upon the knowledge and experience of such firm as airport financial consultants. LeighFisher has consented to the inclusion of their report herein.

UNDERWRITING

The 2019 Bonds are being purchased by the underwriters listed on the cover page hereof (collectively, the "*Underwriters*"), for whom Citigroup Global Markets Inc. is acting as representative. The Underwriters have agreed, subject to certain conditions, to purchase all of the 2019 Bonds from the Authority at an aggregate underwriters' discount from the initial public offering prices or yields set forth on page (i) hereof equal to $1,334,445.61 and to reoffer such 2019 Bonds at public offering prices not higher than or at yields not lower than those set forth on page (i) hereof. The Underwriters are obligated to purchase all such 2019 Bonds if any are purchased. The obligation of the Underwriters to make each such purchase and any such reoffering will be subject to certain terms and conditions set forth in the purchase contract relating to the 2019 Bonds (the "*Purchase Contract*"), the approval of certain legal matters by counsel and certain other conditions.

The 2019 Bonds may be offered and sold by the Underwriters to certain dealers (including dealers depositing such 2019 Bonds in unit investment trusts or mutual funds, some of which may be managed by the Underwriters) and certain dealer banks and banks acting as agents at prices lower (or yields higher) than the public offering prices (or yields) set forth on page (i) of this Official Statement. Subsequent to such initial public offering, subject to the Purchase Contract, the Underwriters may change the public offering prices (or yields) as they may deem necessary in connection with the offering of such 2019 Bonds.

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

Citigroup Global Markets Inc., an underwriter of the 2019 Bonds, has entered into a retail distribution agreement with Fidelity Capital Markets, a division of National Financial Services LLC (together with its affiliates, "*Fidelity*"). Under this distribution agreement, Citigroup Global Markets Inc. may distribute municipal securities to retail investors at the original issue price through Fidelity. As part of this arrangement, Citigroup Global Markets Inc. will compensate Fidelity for its selling efforts.

BofA Securities, Inc., an underwriter of the 2019 Bonds, has entered into a distribution agreement with its affiliate Merrill Lynch, Pierce, Fenner & Smith Incorporated ("*MLPF&S*"). As part of this arrangement, BofA Securities, Inc. may distribute securities to MLPF&S, which may in turn distribute such securities to investors through the financial advisor network of MLPF&S. As part of this arrangement, BofA Securities, Inc. may compensate MLPF&S as a dealer for their selling efforts with respect to the 2019 Bonds.

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

One or more of the Underwriters may have from time to time entered into, and may in the future enter into, distribution agreements with other broker-dealers (that have not been designated by the Authority as Underwriters) for the distribution of the 2019 Bonds at the original issue prices. Such agreements generally provide that the relevant Underwriter will share a portion of its underwriting compensation or selling concession with such broker-dealers.

FINANCIAL ADVISOR

PFM Financial Advisors LLC ("*PFM*") is serving as financial advisor to the Authority for the issuance of the 2019 Bonds. PFM is not obligated to undertake, and has not undertaken, either to make an independent verification of or to assume responsibility for the accuracy, completeness, or fairness of the information contained in this Official Statement. PFM is an independent financial advisory firm and is not engaged in the business of underwriting, trading or distributing securities. PFM is a registered municipal advisor with the Securities and Exchange Commission and the Municipal Securities Rulemaking Board under the Dodd-Frank Act of 2010.

CONTINUING DISCLOSURE

1978 Trust Agreement Information

The Authority is required by the 1978 Trust Agreement to prepare, file with the Trustee and mail to all Bondholders of Record (DTC or DTC's partnership nominee, as long as the 2019 Bonds are so registered), within 60 days of the end of each fiscal year, a report setting forth, among other things, the status of all funds and accounts created under the 1978 Trust Agreement, and to prepare, file with the Trustee and mail to all such Bondholders of Record within three months of the end of each fiscal year a report on the audit of the books and accounts of the Authority by the Authority's independent public accountants. The Authority is also required by the 1978 Trust Agreement to send certain documents and reports to all Bondholders of Record. The Director of Administration and Finance of the Authority, or his or her designee from time to time, shall be the contact person on behalf of the Authority from whom the foregoing information, data and notices may be obtained. The name, address and telephone number of the initial contact person are Anna M. Tenaglia, Acting Director of Administration and Finance/Secretary-Treasurer, Massachusetts Port Authority, One Harborside Drive, Suite 200S, East Boston, Massachusetts 02128-2909, Tel: (617) 568-5000.

Continuing Disclosure Undertakings

In connection with the issuance of the 2019 Bonds, the Authority will undertake for the benefit of the owners of the 2019 Bonds to provide certain continuing disclosure pursuant to the provisions of Rule 15c2-12(b)(5) under the Securities Exchange Act of 1934. More specifically, the Authority will agree in a continuing disclosure certificate (the "*Continuing Disclosure Certificate*") to be executed by the Authority upon issuance of the 2019 Bonds to provide certain financial information and operating data relating to the Authority's preceding fiscal year by no later than January 1 of each year (the "*Annual Information*") and to provide notices of the occurrence of certain enumerated events. The nature of the information to be included in the Annual Information and the notices of enumerated events is set forth in APPENDIX G – Form of Continuing Disclosure Certificate.

The Authority has previously undertaken, for the benefit of the owners of its Bonds issued prior to the 2019 Bonds, to provide certain continuing disclosure pursuant to a Continuing Disclosure Certificate dated as of July 19, 2012 (the "*2012 Continuing Disclosure Certificate*"). All currently outstanding Bonds of the Authority are subject to and have the benefits of the 2012 Continuing Disclosure Certificate. In connection with the issuance of its CFC Revenue Bonds, the Authority has agreed to provide annual updated data with respect to certain other information regarding the Authority and the Airport pursuant to a Continuing Disclosure Certificate dated as of June 15, 2011 with respect to the CFC Revenue Bonds.

In order to provide certain continuing disclosure with respect to its Bonds previously issued under the 1978 Trust Agreement and its CFC Revenue Bonds, the Authority entered into a Disclosure Dissemination Agent Agreement with Digital Assurance Certification, L.L.C. ("*DAC*"), dated as of January 8, 2010. The Authority shall amend the Disclosure Dissemination Agent Agreement to include coverage of the 2019 Bonds by this agreement.

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

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

MASSACHUSETTS PORT AUTHORITY

By: *<u>/s/ Lewis Evangelidis</u>*
Lewis Evangelidis, Chairman

By: *<u>/s/ John P. Pranckevicius</u>*
John P. Pranckevicius, Acting Chief Executive Officer and Executive Director

APPENDIX A

INFORMATION STATEMENT OF THE AUTHORITY

TABLE OF CONTENTS

TABLE OF MAPS:

THE AUTHORITY

Purpose

This Information Statement provides certain information concerning the Massachusetts Port Authority (the "*Authority*") in connection with the sale by the Authority of its Revenue Bonds, Series 2019-B (Non-AMT) (the "*2019-B Bonds*") and its Revenue Bonds, Series 2019-C (AMT) (the "*2019-C Bonds*," and together with the 2019-B Bonds, the "*2019 Bonds*"). Capitalized terms not defined in this Appendix A are used as defined in the Official Statement, except as otherwise noted herein. The 2019 Bonds are being issued under the 1978 Trust Agreement and are secured solely by the Revenues pledged thereunder.

The Authority

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

Powers and Facilities

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

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

Members and Management

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

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

Members of the Board	**Expiration of Term (June 30)**
Stephanie Pollack Secretary of Transportation and Chief Executive Officer of the Massachusetts Department of Transportation (“*MassDOT*”), Commonwealth of Massachusetts	*
Lewis Evangelidis, Chairman Worcester County Sheriff	2020
Warren Q. Fields Chief Executive Officer, Pyramid Advisors, LLC	2025
Patricia A. Jacobs President, AT&T New England	2023
John A. Nucci Senior Vice President for External Affairs, Suffolk University	2022
Sean M. O’Brien President, Teamsters Local 25	2019†
Laura J. Sen Board Member, Massachusetts Mutual Life Insurance Company Board Member, Burlington Stores, Inc.	2024

* The Secretary of Transportation is an *ex officio* Member of the Board.
† Will continue to serve until a successor is appointed and qualified.

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

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

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

John P. Pranckevicius, Acting Chief Executive Officer and Executive Director, joined the Authority in May 2007 and previously served as the Authority’s Director of Administration and Finance/Secretary-Treasurer. As Acting CEO, he oversees the Authority’s operation of Boston Logan International Airport, Hanscom Field, Worcester Regional Airport, the Port of Boston’s Conley Container Terminal and Flynn Cruiseport Boston, and management of real estate holdings in South Boston, East Boston and Charlestown. In his 11 years as a senior executive at the Authority, Mr. Pranckevicius has played a significant role in advancing the Authority’s transportation and economic development missions. He was a major contributor to the development of the Authority’s Strategic Plan, which focused on increasing international flights and reconfiguring the domestic terminals to manage growth at Logan Airport, as well as dredging Boston Harbor and modernizing Conley Terminal to ensure the long-term competitiveness of the Port of Boston. His financial acumen and negotiation skills were instrumental in advancing more than three million square feet of private development including the Omni Summer Street Hotel, Waterside Place, Gables Seaport and Parcel K. Further, under Mr. Pranckevicius’ leadership, the Authority’s bond ratings were raised to Aa2, one of the highest airport ratings in the country. Prior to joining the Authority, Mr. Pranckevicius served as the Chief Financial Officer for the City of Worcester, Massachusetts. He is licensed in the Commonwealth as a Certified Public Accountant, and holds a B.A. degree and a Masters in Public Administration from the University of Maine and an M.S. in Accountancy from Bentley University.

Mr. Pranckevicius was appointed Acting Chief Executive Officer and Executive Director by the Board, effective November 16, 2018, upon the resignation of Thomas P. Glynn. The Board commenced a search for a permanent Chief Executive Officer and Executive Director, and on June 27, 2019, the Board selected Lisa Wieland, the Authority's Port Director, as the Authority's next Chief Executive Officer. Mr. Pranckevicius will remain the Acting Chief Executive Officer and Executive Director until Ms. Wieland takes office, which is expected to be in August 2019, at which time Mr. Pranckevicius is expected to resume his prior role as the Authority's Director of Administration and Finance/Secretary-Treasurer.

Anna M. Tenaglia, Acting Director of Administration and Finance/Secretary-Treasurer, joined the Authority in June 2008 and served as the Authority's Director of Treasury since March 2015. In November 2018, she was appointed Acting Director of Administration and Finance/Secretary-Treasurer. As Acting Director of Administration and Finance/Secretary-Treasurer, Ms. Tenaglia oversees the Authority's financial responsibilities including treasury, budgeting, accounting, debt and investment management and administration, and serves as Treasurer-Custodian of the Massachusetts Port Authority Employees' Retirement System and Chair of the Authority's Retiree Benefits Trust. Prior to joining the Authority, Ms. Tenaglia was the Chief Financial Officer for the City of Gloucester, the Treasurer/Assistant Finance Director for the City of Chelsea and was also a former Vice President at State Street Bank's Institutional Investor Services Division. She holds a B.S. in finance from Suffolk University and an M.B.A. with a concentration in finance from the University of Southern New Hampshire. She is a designated Certified Treasury Professional (CTP). Once Ms. Wieland takes office as Executive Director, it is expected that Ms. Tenaglia will assume a newly created role of Deputy Director of Administration and Finance.

Joel Barrera, Director of Strategic and Business Planning, joined the Authority in October 2018. He is responsible for overseeing the department charged with master planning, aviation planning, transportation planning, and environmental planning and permitting for the Authority. Prior to joining the Authority, he was Deputy Chief of Staff for Strategic Innovation in the Office of Governor Charlie Baker, and prior to that he served as Deputy Director for the Metropolitan Area Planning Council, the regional planning agency for metropolitan Boston. He has a B.A. from Princeton University and an M.A. from Worcester College, Oxford University.

Kwang Chen, Chief Information Officer, joined the Authority in June 2019 and has over 20 years of experience in the Information Technology industry, primarily within the transportation sector. He is responsible for the IT systems and infrastructure for both employees and customers of the Authority, across all of the Authority's facilities. These systems span areas including cyber and information security, aviation and maritime operations, passenger information, financial operations, and telecommunications. Prior to joining the Authority, Mr. Chen served as a Vice President and in other senior IT leadership roles at such places as Abu Dhabi Terminals, Global Container Terminals Canada, Yusen Terminals Inc., and APM Terminals. In addition to his roles in IT operations and administration, he has led strategic IT planning initiatives and business transformation efforts. Mr. Chen has a B.S. in Management Information Systems from Cal State University Long Beach, and an M.B.A. from the University of Northern British Columbia.

Alaina Coppola, Director of Community Relations & Government Affairs, joined the Authority's Community Relations department in 2003 and was appointed to her current position in January 2019 after serving as Assistant Director of Administration and Community Giving since July 2017. She is responsible for directing the development and implementation of community and government relations and charitable giving initiatives designed to strengthen the relationship between the Authority and its neighboring communities. Ms. Coppola holds a B.S. degree from Suffolk University.

Brian M. Day, Director of Labor Relations/Labor Counsel, joined the Authority in September 2006. He is responsible for all matters related to each of the Authority's union collective bargaining agreements and all other union related matters affecting the Authority's mission and its tenants, customers, employees and the public. Mr. Day is responsible for negotiating and properly administering the Authority's union collective bargaining agreements, as well as overseeing the resolution of all union labor disputes. Prior to joining the Authority, he was a Senior Labor Relations Representative for the MBTA and prior to that was the Chief of Staff for the Massachusetts House of Representatives' Chairman of the Joint Committee on Transportation. He has a B.A. in Politics from Fairfield University and received his J.D. from Suffolk University Law School.

Virginia Bennett Flynn, Director of Internal Audit, joined the Authority in December 2018. She is responsible for all activities within the Authority's Internal Audit function, which reviews the integrity and effectiveness of internal controls across Authority operations and services. Mrs. Flynn reports directly to the Audit Committee of the Board to ensure the function's independence and objectivity. Prior to joining the Authority, she was the Head of Accreditation and Audit Services for the Global Legal Entity Identifier Foundation, and prior to that she served as the Senior Vice President of Audit Services for Interactive Data Corporation. She has a B.A. in Economics from Framingham State University and received her M.B.A from Suffolk University.

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

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

Andrew G. Hargens, Chief Development Officer, joined the Authority in 1995 and has served in a variety of planning, asset management, and real estate development roles since that time. Prior to his designation as Chief Development Officer in June 2018, Mr. Hargens served as Deputy Director for Real Estate Development. Before joining the Authority, Mr. Hargens worked as an environmental consultant for TRC Corporation and Eastern Research Group. Mr. Hargens has a B.A. in Geology from Harvard University and a Masters in Public Policy and Planning from Tufts University.

Pi Tao Hsu, Director of Treasury, joined the Authority in May 2019. She is responsible for developing and implementing the Authority's financial policies including debt financing, optimal funding for the Authority's capital program and investment of the Authority's revenues, and she manages all aspects of the Treasury department. Ms. Hsu brings more than 25 years of experience in public/municipal capital financing, transaction structuring/negotiation and treasury management, as well as strategic financial planning and investment advisory skills. Prior to joining the Authority, Ms. Hsu was the Vice President of Capital Markets for the District of Columbia Housing Finance Agency. She also served as the Director of Financial Planning at the MBTA and held various positions in financial management with the Jacksonville Electric Authority, Hillsborough County, and the Illinois Housing Development Authority. Ms. Hsu holds a B.A. in Economics from Soochow University and an M.B.A. with a concentration in Finance from Syracuse University.

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

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

Catherine M. McDonald, Chief Legal Counsel, joined the Authority in 1999 and was appointed to her current position in January 2016, having served as Acting Chief Legal Counsel since July 2015. She also served as the Authority's Chief of Staff from October 2017 to November 2018. She oversees legal activity in all functional areas including real estate, construction, litigation, employment and ethics, maritime, aviation, security and public finance. Prior to joining the Authority, Ms. McDonald was an Assistant Chief of Staff in the Governor's Office, an Associate at McDermott, Will and Emery and a law clerk to the Honorable A. David Mazzone of the United States District Court for Massachusetts. Ms. McDonald holds degrees from Northeastern University and Suffolk University School of Law.

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

Reed Passafaro, Acting Chief of Staff, joined the Authority in March 2014 and was appointed to his current position in November 2018 after serving as Senior Business and Policy Manager for the Authority's Maritime Division. Prior to joining the Authority, Mr. Passafaro worked for the City of Boston as the Director of Speechwriting under former Mayor Thomas M. Menino. He has a B.A. from Saint John Fisher College and an M.B.A from Northeastern University's D'Amore-McKim School of Business.

John Raftery, Chief Marketing Officer, joined the Authority in February 2019. He oversees external and internal communications and marketing strategies, advertising, branding, promotional campaigns and event planning both for the Authority and its facilities. Mr. Raftery also serves as Adjunct Professor at Boston University teaching evening graduate and undergraduate courses in advertising, marketing and new media. Prior to joining the Authority, Mr. Raftery was SVP, Director of Brand Experience at Arnold Worldwide and has over 20 years of marketing leadership experience on both the agency and client side. He has a B.A. in English and Communications from the University of Massachusetts.

Harold H. Shaw, Chief Security Officer, joined the Authority in January 2019. He is responsible for all security matters relevant to the Authority with oversight of the corporate security and emergency preparedness programs and the respective security teams in the functional and staff departments. Mr. Shaw is responsible for establishing security plans, protocols and exercises, implementing a threat-based approach to counter security risks to the aviation and maritime sectors inherent to the Authority, and collaborating across federal, state, and local law enforcement, as well as with applicable private sector security managers. Fundamental to his responsibilities, he works across departments to develop processes to counter the terrorism and cyber threats of the future. Prior to joining the Authority, Mr. Shaw was a FBI Special Agent, serving in a variety of leadership positions, with a broad-range of experiences within the counterterrorism, counterintelligence, cyber and criminal programs. He previously served as the Special Agent in Charge of the FBI Boston Division, responsible for all operations, intelligence functions, and liaison activities within the states of Massachusetts, Maine, New Hampshire and Rhode Island. A United States Army veteran, Mr. Shaw has a B.S. in Communications from Norwich University.

Houssam "Sam" H. Sleiman, P.E., CCM, FCMAA, NAC, Hon. D.Eng., Director of Capital Programs and Environmental Affairs, joined the Authority in October 1993 and was appointed to his current position in May 2006. He directs the overall management of the Authority's capital improvement program, safety program, utilities management, in-house project design and environmental permitting and management. He also previously served as the Authority's Director of Aviation Administration and Development. Prior to joining the Authority, he worked for the Town of Lexington, Massachusetts. He is a licensed registered Professional Engineer in the Commonwealth and a Certified Construction Manager (CCM). Mr. Sleiman received an honorary doctorate of engineering degree from Wentworth Institute of Technology in 2018. Mr. Sleiman was also awarded the *2018 National Person of the Year* by the Construction Management Association of America (CMAA). Mr. Sleiman was inducted to the CMAA's College of Fellows in 2017, and the National Academy of Construction (NAC) in 2016. He holds an M.S. in Civil Engineering and a B.S. in Civil Engineering from Northeastern University.

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

Lisa S. Wieland, Port Director, joined the Authority in 2006 and has served as Port Director since January 2016, after serving as Acting Port Director since March 2015. In her current role, and previously as Maritime's Chief Administrative Officer, she leads all financial management, business planning, strategic initiatives, process improvement, special projects, and the day-to-day management of the Maritime division. Before joining the Maritime team, Ms. Wieland served in several roles at the Authority, including the Director of Corporate Planning and Analysis and the Director of HR Strategy & Employment. Prior to joining the Authority, Ms. Wieland worked as a Consultant for Bain & Company, serving health care and consumer products clients, and previous to that, for CNN in various news and political assignments. Ms. Wieland received a B.A. degree in Political Science from UCLA and an M.B.A. from Harvard Business School. Ms. Wieland was appointed the next Chief Executive Officer of the Authority on June 27, 2019, and is expected to take office in August 2019. The Authority expects to commence a search for the next permanent Port Director in the summer of 2019.

AIRPORT PROPERTIES

Boston-Logan International Airport

The Airport is the principal source of the Authority's Revenues, Operating Expenses and Net Revenues and is the dominant factor in the determination of the Authority's financial condition. In fiscal year 2018, the Airport Properties accounted for approximately 83.9% of the Authority's Revenues and approximately 89.7% of the Authority's Net Revenues (as defined in the 1978 Trust Agreement). The Airport is situated principally in East Boston (with a small portion situated in the Town of Winthrop), approximately three miles from downtown Boston and adjacent to Boston Harbor. The total land area of the Airport is approximately 2,400 acres.

Air Service Region. The Airport serves the greater Boston area and plays the leading role in New England's air service infrastructure. Based upon information provided by the United States Department of Transportation ("*USDOT*") for fiscal year 2018, approximately 94.2% of total passengers (domestic and international) at the Airport began or ended their air travel ("*origin-destination*" travel) at Logan Airport.

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

The Boston metropolitan area was the 10th largest metropolitan area in the United States in terms of population as of March 2019, and it ranked 9th in the nation with 2.7 million employed individuals as of March 2019. It had an unemployment rate of 2.7% in March 2019, below the national average of 3.8%, and 7.1 percentage points lower than the peak of 9.8% in January 2010. The unemployment rate in the Boston metropolitan area was the 2nd lowest rate among the nation's large metropolitan areas (i.e., those with populations of larger than one million) as of March 2019. In the greater Boston area, the following six major sectors have contributed to the Boston region's economic growth since the early 1990s and currently account for approximately one half of the Boston area employment base: high technology, biotechnology, health care, financial services, higher education and tourism. The Boston metropolitan area's average per capita personal income in calendar year 2017 (the most recent data available) was 35.3% above the national average and 8.7% above the New England average. During the period 2002-2017, Massachusetts per capita income grew slightly faster than the national average. It is projected to grow at a rate of 1.2% annually from 2017 to 2032, which is slightly faster than the national U.S. projected growth rate of 1.1%. For more information regarding the economic characteristics of the Boston metropolitan area, see Chapter 3 of APPENDIX C – Boston Logan International Airport Market Analysis.

Airport Traffic Levels. The following table summarizes Airport operations and passenger traffic statistics for the most recent five fiscal years and the nine-month periods ending March 31, 2018 and 2019. Both operations and passengers are grouped by origin and destination regardless of whether the carrier was a U.S. air carrier or a foreign flag carrier.

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SELECTED BOSTON-LOGAN INTERNATIONAL AIRPORT TRAFFIC STATISTICS

(Fiscal Year Ended June 30, except as noted)

	2014	2015	2016	2017	2018	Nine Months Ending 3/31/2018	Nine Months Ending 3/31/2019
Aircraft Operations (1)							
Domestic (2)	219,534	224,928	237,479	244,857	257,296	187,042	195,758
International (3)	38,059	41,084	46,687	51,500	52,483	38,387	40,027
Regional	79,983	71,233	72,416	68,223	71,198	51,830	57,411
General Aviation	26,286	26,114	30,026	31,300	31,186	22,652	21,844
Total Operations	363,862	363,359	386,608	395,880	412,163	299,911	315,040
Aircraft Landed Weights (1,000 pounds) (4)	20,297,245	20,784,046	22,652,895	24,040,957	25,249,192	18,384,711	19,481,434
Passengers Traffic							
Domestic (2)							
Enplaned	11,990,184	12,551,985	13,368,762	14,257,124	14,995,819	10,836,335	11,477,510
Deplaned	12,045,512	12,591,542	13,466,887	14,348,544	15,079,032	10,811,796	11,433,676
International (3)							
Enplaned	2,337,269	2,611,642	3,004,322	3,493,005	3,609,751	2,581,570	2,828,034
Deplaned	2,348,399	2,634,590	3,034,210	3,506,567	3,649,730	2,650,170	2,872,075
Regional							
Enplaned	1,011,299	903,180	962,163	881,940	1,030,643	744,877	849,139
Deplaned	1,021,968	910,348	952,308	871,399	1,028,876	743,322	850,546
Subtotal	30,754,631	32,203,287	34,788,652	37,358,579	39,393,851	28,368,070	30,310,980
General Aviation ("GA")							
Total Passengers	95,632	95,934	109,766	111,772	112,658	81,572	79,406
Total Passengers	30,850,263	32,299,221	34,898,418	37,470,351	39,506,509	28,449,642	30,390,386
Total Enplaned Passengers (excluding GA)	15,338,752	16,066,807	17,335,247	18,632,069	19,636,213	14,162,782	15,154,683
Average Passengers Per Flight							
Domestic (2)	109.5	111.8	113.0	116.8	116.9	115.7	117.0
International (3)	123.1	127.7	129.3	135.9	138.3	136.3	142.4
Regional	25.4	25.5	26.4	25.7	28.9	28.7	29.6
Air Carrier and Passenger Metrics							
Primary carrier	JetBlue	JetBlue	JetBlue	JetBlue	JetBlue	JetBlue	JetBlue
Primary carrier market share (5)	26.5%	26.9%	26.5%	27.2%	27.9%	27.8%	28.6%
Two top carriers market share	37.7%	39.2%	40.7%	44.3%	44.1%	44.0%	44.3%
Origination & destination share (6)	94.5%	94.5%	94.8%	94.4%	94.2%	N/A	N/A
Compensatory airline payments to Massport per enplaned passenger (7)	$13.55	$13.78	$13.45	$13.98	$14.37	$14.83	$14.60
Logan Airport revenue per enplaned passenger (8)	$34.07	$34.76	$33.85	$34.25	$35.39	$36.26	$35.84
Total Cargo & Mail (1,000 pounds)	572,226	625,749	606,101	672,402	727,175	545,075	552,800

(1) Includes all-cargo flights.
(2) Includes domestic flights on jets and charters.
(3) Includes international flights on jet, charter and commuter carriers.
(4) Excludes general aviation and non-tenant.
(5) Data consists of mainline activity only.
(6) The source of this statistic is the Masschusetts Port Authority and U.S. DOT, Air Passenger Origin-Destination Survey, reconciled to Schedules T1 and 298C T1, as reported in Appendix CFC-1 to the Authority's CAFR; this statistic is calculated based on outbound passengers only as of fiscal year end.
(7) Consists of landing fees, terminal rents, certain non-PFC passenger fees and aircraft parking fees
(8) Consists of landing fees, terminal rents, parking, utilities, non-terminal and ground rent, concessions and baggage fees.
Source: Authority reports.

Passenger traffic at the Airport totaled 39.5 million passengers for fiscal year 2018 (including general aviation), a 5.4% increase from the 37.5 million passengers who used the Airport in the prior year. Passenger traffic increased 7.4% in fiscal year 2017 and 8.0% in fiscal year 2016. For the nine-month period ending March 31, 2019, passenger traffic was 6.8% greater than the nine-month period ending March 31, 2018. Landed weights for fiscal year 2018 were 5.0% higher than fiscal year 2017, and in the nine-month period ending March 31, 2019, were 6.0% greater than for the same nine-month period ending in 2018. See "AUTHORITY REVENUES – Airport Properties Revenues" and "MANAGEMENT'S DISCUSSION OF HISTORICAL OPERATING RESULTS."

On a calendar year basis, passenger traffic at the Airport totaled approximately 40.9 million passengers in 2018 (including general aviation). This represented a 6.6% increase in passenger traffic over calendar year 2017, following calendar year passenger traffic increases of 5.9% and 8.5% in calendar years 2017 and 2016, respectively.

According to data from the Airports Council International ("*ACI*"), Logan Airport was the most active airport in New England and the 17th most active airport in North America in reporting year 2017 (the most recent data available), based upon total passenger volume. In reporting year 2017 (the most recent year for which data is available), Logan Airport was the 52nd most active in the world according to data from the ACI.

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

Passengers by Traffic Type

Fiscal Year				
Period	**Regional**	**International**	**Domestic**	**Total**
FY2016	1,914,471	6,038,532	26,945,415	34,898,418
FY2017	1,753,339	6,999,572	28,717,440	37,470,351
FY2018	2,059,519	7,259,481	30,187,509	39,506,509

Calendar Year				
Period	**Regional**	**International**	**Domestic**	**Total**
CY2016	1,724,617	6,587,473	27,975,952	36,288,042
CY2017	1,969,890	7,199,595	29,242,934	38,412,419
CY2018	2,184,819	7,583,887	31,173,219	40,941,925

Market Share by Traffic Type

Fiscal Year			
Period	**Regional**	**International**	**Domestic**
FY2016	5.5%	17.3%	77.2%
FY2017	4.7	18.7	76.6
FY2018	5.2	18.4	76.4

Calendar Year			
Period	**Regional**	**International**	**Domestic**
CY2016	4.8%	18.2%	77.1%
CY2017	5.1	18.7	76.1
CY2018	5.3	18.5	76.1

Year over Year Variances by Traffic Type

Fiscal Year				
Period	**Regional**	**International**	**Domestic**	**Total**
FY2016	5.6%	15.1%	6.8%	8.0%
FY2017	(8.4)	15.9	6.6	7.4
FY2018	17.5	3.7	5.1	5.4

Calendar Year				
Period	**Regional**	**International**	**Domestic**	**Total**
CY2016	(6.1)%	19.0%	7.3%	8.5%
CY2017	14.2	9.3	4.5	5.9
CY2018	10.9	5.3	6.6	6.6

Source: Authority.

Domestic jet passengers (including charters) accounted for 76.1% of passenger traffic in calendar year 2018 and 76.1% of passenger traffic in calendar year 2017. The Airport's domestic jet passenger traffic reached 31.2 million in calendar year 2018, surpassing the Airport's previous record for domestic jet passengers of 29.2 million in calendar

* For purposes of the Authority's data compilation, regional airlines are defined as domestic commuter carriers that exclusively operate smaller regional jet and turbo-prop aircraft with up to 90 seats.

year 2017. This represents a 6.6% increase for calendar year 2018 as compared to the previous increase for calendar year 2017 of 4.5%.

In calendar years 2018 and 2017, passengers traveling domestically on regional airlines accounted for approximately 5.3% and 5.1% of total passenger traffic at the Airport, respectively, or approximately 2.2 and 2.0 million passengers each calendar year, respectively. The number of regional passengers (excluding passengers traveling internationally) increased by 10.9% in calendar year 2018, following a 14.2% increase in calendar year 2017 and 6.1% decline in calendar year 2016.

International passengers, including those traveling on foreign flag and U.S. flag carriers (including U.S. regional carriers) accounted for 18.5% of passenger traffic in calendar year 2018, or approximately 7.6 million passengers. This segment increased by 5.3% in calendar year 2018, following increases of 9.3% and 19.0% in calendar years 2017 and 2016, respectively. Of the 18.5% of passengers traveling internationally in calendar year 2018, 51.5% traveled to or from Europe, 14.5% to or from Bermuda and the Caribbean, 13.9% to or from Canada, 8.0% to or from Middle East, 7.0% to or from the Trans-Pacific and 5.1% to or from Central and South America.

In calendar year 2018, there were approximately 424,024 aircraft operations (including both commercial and general aviation) at the Airport, an increase of 5.6% from calendar year 2017. While aircraft operations at the Airport increased more than 22.8% between calendar year 2009 and 2018, the Airport's total passengers (including both commercial and general aviation) increased by 60.5% over the same period. This was due, in part, to the airlines' use of larger-sized aircraft, their achievement of higher capacity during this period and the impact of the recession on calendar year 2009.

The following table shows monthly growth in enplaned passengers (including general aviation) for the 12 months ended March 31, 2018 and 2019. As shown on the table below, for the 12 months ending March 31, 2019, the number of enplaned passengers at the Airport (including general aviation) was 7.2% higher than for the same period in 2018.

BOSTON-LOGAN INTERNATIONAL AIRPORT
MONTHLY GROWTH IN ENPLANED PASSENGER (Year over Year)
12 Months ended 3/31/2018 and 3/31/2019

	12 Mos. Ended 3/31/2018	12 Mos. Ended 3/31/2019	Growth %
April	1,616,857	1,743,389	7.8%
May	1,716,119	1,831,420	6.7
June	1,764,114	1,914,165	8.5
July	1,826,109	1,984,023	8.6
August	1,871,193	2,013,897	7.6
September	1,565,059	1,674,035	7.0
October	1,732,204	1,858,207	7.3
November	1,549,147	1,659,933	7.2
December	1,505,791	1,598,397	6.1
January	1,268,215	1,328,493	4.8
February	1,329,467	1,384,498	4.1
March	1,556,383	1,692,903	8.8
Total 12 months	**19,300,658**	**20,683,360**	**7.2%**

Source: Authority.

Airline Passenger Services. As primarily an origin-destination airport, Logan Airport is served today, as it has been in the past, by a wide variety of carriers. As of July 1, 2019, airline service at the Airport, both scheduled and non-scheduled, will be provided by 52 airlines, as listed in the table below, including ten domestic large jet carriers, 31 non-U.S. flag ("*foreign flag*") carriers and 11 domestic regional and commuter airlines ("*regional airlines*" or "*regional carriers*").

BOSTON-LOGAN INTERNATIONAL AIRPORT
AIRLINES SERVING THE AIRPORT*
(Scheduled as of July 1, 2019)

U.S. Domestic Large Jet Carriers	U.S. Domestic Regional Carriers[1]	
	Independent:	*Affiliated:*
Alaska	Boutique Air	Endeavor Air (Delta Connection)
American	Cape Air	Envoy (American Eagle)
Delta	Silver Airlines	GoJet (Delta Connection)
Frontier		Mesa Airlines (United Express)
Hawaiian		Piedmont (American Eagle)
JetBlue		PSA (American Eagle)
Southwest		Republic Airlines (American Eagle, Delta Connection and United Express)
Spirit		SkyWest (Delta Connection and United Express)
Sun Country		
United		

Foreign Flag Carriers

Aer Lingus	Icelandair	Qatar
Air Canada[2]	Japan Airlines	Royal Air Maroc
Air France	KLM Royal Dutch Airlines	SATA
Alitalia	Korean Air	Scandinavian
British Airways	TAM Lineas Aereas	Swiss International
Cathay Pacific	Level	TACV-Cabo Verde Airlines
Copa Airlines	Lufthansa	TAP Portugal
El Al	Norwegian Air Shuttle	Turkish Airlines
Emirates	Norwegian UK	Virgin Atlantic Airways
Hainan Airlines	Porter Airlines	WestJet
Iberia		

* In calendar year 2018, Logan Airport was also served by 27 different charter-only airlines.

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

2 Includes regional carriers Jazz Air and Sky Regional Airlines, both of which operate as part of Air Canada Express.

The Authority maintains separate statistical data for regional airlines. For purposes of the Authority's data compilation, regional airlines are defined as domestic commuter carriers that exclusively operate smaller regional jet and turbo-prop aircraft with fewer than 100 seats. Most of these carriers are generally subsidiaries or affiliates of major domestic carriers, as noted above, with the exception of Boutique Air, Cape Air and Silver Airlines, which operate their own routes. As of June 30, 2018, the top five regional airlines were Republic Airlines with 38.4% of domestic regional passengers, followed by Endeavor Air with 28.0%, Cape Air with 8.5%, Express Jet with 7.8%, and GoJet with 5.9% of domestic regional passengers.

In response to competitive pressures, the U.S. airline industry has consolidated over the past decade. In 2008, Delta Air Lines ("*Delta*") and Northwest Airlines merged and consolidated under the Delta name. In 2010, United Airlines ("*United*") and Continental Airlines completed a merger transaction and in 2012 consolidated all activity under the United name. In 2011, Southwest Airlines ("*Southwest*") and AirTran Airways completed a merger transaction and as of the end of calendar year 2014 consolidated all operations under the Southwest name. In 2013, American Airlines ("*American*") and US Airways merged and as of October 2015 all operations were integrated under the American name, creating the world's largest airline. In December 2016, Alaska Airlines ("*Alaska*") acquired Virgin America and in January 2018 all operations were consolidated under the Alaska name, making Alaska the fifth largest domestic carrier in terms of enplaned passengers. As a result of the above-described mergers, the five largest U.S. air carrier airlines now consist of Alaska, American, Delta, Southwest and United.

The following table shows passenger traffic for the carriers providing service from Logan Airport for the past five fiscal years and for the nine months ended March 31, 2018 and March 31, 2019. For the nine months ended March 31, 2019, the Airport experienced an aggregate 6.8% increase in passenger traffic, compared to the nine months ended March 31, 2018.

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

Air Carrier [1]	2014	2015	2016	2017	2018	Nine Months Ended 3/31/18	Nine Months Ended 3/31/19	Growth %
American [2]	**6,941,775**	**7,054,759**	**7,130,681**	**6,693,236**	**6,632,752**	**4,786,257**	**4,904,890**	**2.5%**
American	*3,082,718*	*3,030,967*	*5,079,473*	-	-	-	-	*
US Airways	*3,859,057*	*4,023,792*	*2,051,208*	-	-	-	-	*
Delta [3]	**4,374,313**	**4,756,868**	**5,102,225**	**5,582,876**	**6,491,173**	**4,607,254**	**5,365,666**	**16.5**
JetBlue	**8,181,523**	**8,680,357**	**9,253,087**	**10,174,855**	**11,007,911**	**7,922,555**	**8,705,958**	**9.9**
Southwest [4]	**2,540,146**	**2,455,713**	**2,827,355**	**3,064,506**	**2,990,557**	**2,169,607**	**2,062,710**	**(4.9)**
AirTran Airways	*599,766*	*100,691*	-	-	-	-	-	*
Southwest	*1,940,380*	*2,355,022*	-	-	-	-	-	*
United [5]	**3,749,091**	**3,614,914**	**3,822,367**	**3,953,232**	**3,982,764**	**2,898,578**	**3,000,096**	**3.5**
Foreign Flag	**3,359,482**	**3,878,971**	**4,539,853**	**5,412,118**	**5,626,482**	**4,050,356**	**4,368,702**	**7.9**
Regional U.S. Carriers [6]	**265,274**	**239,607**	**241,021**	**235,438**	**221,944**	**166,466**	**138,149**	**(17.0)**
Other U.S. Carriers [7]	**1,343,027**	**1,522,098**	**1,872,063**	**2,242,318**	**2,440,268**	**1,766,997**	**1,764,809**	**(0.1)**
Total[8]	**30,754,631**	**32,203,287**	**34,788,652**	**37,358,579**	**39,393,851**	**28,368,070**	**30,310,980**	**6.8%**

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

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

(3) Includes Delta Shuttle and Delta Connection.

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

(5) Includes United Express.

(6) Includes PenAir (through June 30, 2018), Boutique Air (commencing June 1, 2018) and Cape Air.

(7) Includes Alaska, Spirit Airlines, Sun Country, Virgin America (merged with Alaska effective January 11, 2018) and charter/non-scheduled domestic service.

(8) Excludes general aviation figures.

* Not meaningful.

Source: Authority.

The relative share of various carriers at the Airport has fluctuated with no individual carrier having a market share of over 27.9% in any of the past ten fiscal years. The following table presents the relative shares of the U.S. air carrier airlines carrying the highest shares of total passenger traffic at the Airport, as well as the relative shares of the independent regional airlines and foreign flag carriers, during the last five fiscal years and the nine-month periods ended March 31, 2018 and 2019. Since commencing service at Logan in 2004, JetBlue Airways ("*JetBlue*") has made Logan Airport its second largest focus airport after New York-JFK. As a result, as reflected in the table below, in fiscal year 2018, JetBlue had the largest market share with 27.9% of all passengers, and for the nine months ended March 31, 2019 JetBlue also had the largest share with 28.7%. The carriers with the highest market shares—American, Delta, JetBlue, Southwest and United—carried an aggregate of 78.9% of all passengers traveling through the Airport in fiscal year 2018. For additional information regarding airline market shares at Logan (reported on a calendar year basis), see Section 4.3 of APPENDIX C – Boston Logan International Airport Market Analysis.

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

Air Carrier[1]	2014	2015	2016	2017	2018	Nine Months Ended 3/31/18	Nine Months Ended 3/31/19
American [2]	**22.5%**	**21.9%**	**20.5%**	**17.9%**	**16.8%**	**16.9%**	**16.2%**
American	*10.0*	*9.4*	*14.6*	--	--	--	--
US Airways	*12.5*	*12.5*	*5.9*	--	--	--	--
Delta [3]	**14.2**	**14.7**	**14.7**	**14.9**	**16.5**	**16.2**	**17.7**
JetBlue	**26.5**	**26.9**	**26.6**	**27.2**	**27.9**	**27.9**	**28.7**
Southwest [4]	**8.2**	**7.6**	**8.1**	**8.2**	**7.6**	**7.6**	**6.8**
AirTran Airways	*1.9*	*0.3*	--	--	--	--	--
Southwest	*6.3*	*7.3*	--	--	--	--	--
United [5]	**12.2**	**11.2**	**11.0**	**10.6**	**10.1**	**10.2**	**9.9**
Foreign Flag	**10.9**	**12.0**	**13.0**	**14.5**	**14.3**	**14.3**	**14.4**
Regional U.S. Carriers [6]	**0.9**	**0.7**	**0.7**	**0.6**	**0.6**	**0.6**	**0.5**
Other U.S. Carriers [7]	**4.7**	**4.7**	**5.4**	**6.0**	**6.2**	**6.2**	**5.8**
Total [8]	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

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

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

(3) Includes Delta Shuttle and Delta Connection.

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

(5) Includes United Express.

(6) Includes PenAir (through June 30, 2018), Boutique Air (commencing June 1, 2018) and Cape Air.

(7) Includes Alaska, Spirit Airlines, Sun Country, Virgin America (merged with Alaska effective January 11, 2018) and charter/non-scheduled domestic service.

(8) Excludes general aviation figures.

Source: Authority.

The following table shows changes in passenger traffic for the largest carriers serving Logan Airport for the past five fiscal years and for the nine months ended March 31, 2018 and March 31, 2019.

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

Air Carrier [1]	2014	2015	2016	2017	2018	Nine Months Ended 3/31/18	Nine Months Ended 3/31/19	CAGR* 2014-2018
American [2]	**1.1%**	**1.6%**	**1.1%**	**(6.1)%**	**(0.9)%**	**2.6%**	**2.5%**	**(1.1)%**
American	*(2.9)*	*(1.7)*	--	--	--	--	--	--
US Airways	*4.4*	*4.3*	--	--	--	--	--	--
Delta [3]	**3.8**	**8.7**	**7.3**	**9.4**	**16.3**	**16.7**	**16.5**	**10.4**
JetBlue	**6.0**	**6.1**	**6.6**	**10.0**	**6.6**	**6.9**	**9.9**	**7.7**
Southwest [4]	**6.5**	**(3.3)**	**15.1**	**8.4**	**(2.4)**	**(2.4)**	**(4.9)**	**4.2**
AirTran Airways	*(30.5)*	*(83.2)*	--	--	--	--	--	--
Southwest	*27.5*	*21.4*	--	--	--	--	--	--
United [5]	**3.8**	**(3.6)**	**5.7**	**3.4**	**0.7**	**0.1**	**3.5**	**1.5**
Foreign Flag	**10.7**	**15.5**	**17.0**	**19.2**	**4.0**	**3.7**	**7.9**	**13.8**
Regional U.S. Carriers [6]	**6.9**	**(9.7)**	**0.6**	**(2.3)**	**(5.7)**	**(6.9)**	**(17.0)**	**(4.4)**
Other U.S. Carriers [7]	**8.5**	**12.5**	**23.0**	**19.8**	**8.8**	**8.8**	**(0.1)**	**16.1**
Total [8]	**4.9%**	**4.7%**	**8.0%**	**7.4%**	**5.4%**	**4.7%**	**6.8%**	**6.4%**

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

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

(3) Includes Delta Shuttle and Delta Connection.

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

(5) Includes United Express.

(6) Includes PenAir (through June 30, 2018), Boutique Air (commencing June 1, 2018) and Cape Air.

(7) Includes Alaska, Spirit Airlines, Sun Country, Virgin America (merged with Alaska effective January 11, 2018) and charter/non-scheduled domestic service.

(8) Excludes general aviation figures.

* CAGR stands for Compound Annual Growth Rate.

Source: Authority.

International Passenger Services. International passenger traffic grew by 3.7%, 15.9% and 15.1% in fiscal years 2018, 2017 and 2016, respectively, increasing by 54.9% from fiscal year 2014 to fiscal year 2018. The carriers with the largest market shares of international enplanements in fiscal year 2018 were JetBlue with 12.6%, Delta with 9.4%, Air Canada with 8.9% and British Airways with 7.9%. The market share of foreign flag carriers serving the Airport has also increased over the five years ending in fiscal year 2018, from 10.9% of passenger traffic in fiscal year 2014 to 14.3% in fiscal year 2018. For fiscal year 2018, the shares of international passengers at the Airport were 51.9% for Europe, 14.4% for Canada, 14.3% for Bermuda and the Caribbean, 8.1% for the Middle East, 7.2% for Trans-Pacific and 4.1% for Central/South America.

The following table shows passenger enplanements for the carriers providing international service from Logan Airport for the past five fiscal years and for the nine months ended March 31, 2018 and March 31, 2019. For the nine months ended March 31, 2019, the Airport experienced an aggregate 9.5% increase in international passenger enplanements.

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

Air Carrier [1]	2014	2015	2016	2017	2018	Nine Months Ended 3/31/18	Nine Months Ended 3/31/19	Growth %
Aer Lingus	187,543	202,529	219,334	222,246	190,159	135,316	140,320	3.7%
Aeromexico [2]	-	2,318	26,717	32,360	39,342	29,440	23,368	(20.6)
Air Berlin [3]	-	-	5,256	24,748	17,099	17,099	-	*
Air Canada [4]	236,325	249,372	261,528	302,105	321,306	230,313	242,221	5.2
Air France	121,647	115,588	113,351	107,685	103,528	79,085	93,330	18.0
Alitalia	53,560	56,474	57,249	56,410	58,161	37,722	40,734	8.0
American Airlines	18,409	11,433	27,031	28,219	24,463	21,521	10,283	(52.2)
Avianca/TACA Airlines [5]	-	-	-	1,758	21,798	16,357	37,835	*
British Airways	307,669	304,353	286,570	288,971	285,467	201,448	211,215	4.8
Cathay Pacific	-	8,910	49,808	62,708	87,088	64,782	64,847	0.1
COPA Airlines	33,201	33,888	35,344	42,958	57,721	39,974	48,962	22.5
Delta Air Lines	259,683	256,581	273,143	294,973	339,962	240,042	249,413	3.9
El AL	-	363	25,539	25,437	26,021	19,804	21,687	9.5
Emirates	26,056	98,538	149,645	166,240	110,337	82,040	79,378	(3.2)
Hainan	1,401	49,903	80,791	110,592	114,554	83,419	81,797	(1.9)
IBERIA	31,521	33,193	37,245	45,969	58,581	35,317	42,943	21.6
Icelandair	91,109	104,089	108,816	117,344	110,955	80,113	77,921	(2.7)
Japan Airlines	58,028	59,052	59,191	61,061	62,424	45,982	49,053	6.7
JetBlue	371,912	398,551	444,256	471,084	455,040	330,135	410,254	24.3
KLM Royal Dutch Airlines	-	-	-	-	-	-	176	*
Level	-	-	-	-	6,606	582	28,669	*
Lufthansa German Airlines	221,380	218,181	214,114	215,581	216,658	152,703	161,882	6.0
Norwegian Air	-	-	31,993	95,782	77,381	68,690	34,689	(49.5)
Norwegian UK	-	-	-	-	29,632	1,404	78,972	*
Porter Airlines Inc.	81,277	88,691	95,658	104,925	102,082	72,554	76,898	6.0
Qatar Airway	-	-	19,377	68,626	74,048	54,858	65,250	18.9
SATA Internacional	45,114	51,202	61,601	67,193	71,800	53,331	46,282	(13.2)
Scandinavian	-	-	5,221	20,645	25,724	15,990	14,369	(10.1)
Swiss International	73,029	70,677	76,827	85,582	89,381	69,072	73,629	6.6
TACV-Cabo Verde Airlines	14,405	13,237	-	-	3,343	1,187	4,841	*
TAM – Linhas Aereas	-	-	-	-	-	-	27,749	*
Thomas Cook [5]	-	-	2,343	10,729	12,324	8,927	6,548	(26.6)
Transportes Aeros Portugeses S.A.	-	-	4,957	74,909	77,741	55,169	51,971	(5.8)
Turkish	10,760	78,945	75,592	60,355	77,037	54,066	58,141	7.5
US Airways, Inc.	11,299	12,608	3,212	-	-	-	-	*
Virgin Atlantic Airways, Ltd.	80,183	80,095	77,463	76,144	80,454	55,597	60,546	8.9
WestJet Encore	-	-	19,142	78,720	102,683	70,669	51,274	(27.4)
WOW Air [5]	-	11,571	53,553	64,041	66,061	48,822	46,095	(5.6)
Discontinued Service [6]	-	-	-	1,576	11,781	6,880	13,557	97.0
Non-Signatory/Charter [7]	1,758	1,300	2,455	5,329	1,009	1,160	935	(19.4)
Total	**2.337,269**	**2,611,642**	**3,004,322**	**3,493,005**	**3,609,751**	**2,581,570**	**2,828,034**	**9.5%**

[1] In addition to the carriers shown in this table, in fiscal year 2019, Korean Air will commence service from Logan to Seoul, Norwegian Air will commence service from Logan to Rome and Royal Air Maroc will commence service to Casablanca.

[2] Aeromexico terminated service in January 2019.

[3] AirBerlin commenced seasonal service in May 2016 and ceased operations on September 30, 2017, then declared bankruptcy.

[4] Includes Jazz Air and Sky Regional, which are feeder operations for Air Canada.

[5] WOW Air ceased operations in March 2019; Avianca terminated service at Logan in April 2019 and TACA is scheduled to terminate service at Logan in May 2019; and Thomas Cook terminated service in September 2018.

[6] Includes (i) Air Europa, which discontinued seasonal service after summer 2017, and (ii) Primera Air, which ceased operations on September 30, 2018, then declared bankruptcy.

[7] Includes Eurowings, which commenced service in June 2016 and stopped service by September 2016.

* Not meaningful.

Passenger Markets. As of June 1, 2019, scheduled non-stop service from the Airport was offered to 76 domestic and 56 international destinations (including seasonal activity). This represents the same number of domestic destinations and one fewer international destination since June 1, 2018. Of the total domestic markets served by the Airport, 47 are served by two or more carriers. Based on published preliminary airline schedules and the Authority's industry knowledge, including the consideration of historical performance, the Authority expects an overall 4.7% increase in total scheduled seat capacity for the last six months of calendar year 2019 compared to the same period in the prior year. This is comprised of projected increases in scheduled seat capacity for domestic and international destinations of 4.4% and 6.0%, respectively. As reflected in the table below, American, Delta, JetBlue and Spirit all increased their scheduled departing seats for the last six months of calendar year 2019.

BOSTON-LOGAN INTERNATIONAL AIRPORT
SCHEDULED DEPARTING SEATS BY CARRIER
(Six Months Ended 12/31/18 and 12/31/19)

Carrier*	July – Dec 2018	July – Dec 2019	% Increase/(Decrease)
JetBlue	3,499,329	3,521,004	0.6%
Delta	2,215,504	2,627,549	18.6
American	2,142,802	2,175,567	1.5
United	1,253,006	1,238,672	(1.1)
Southwest	952,606	876,782	(8.0)
Spirit	420,417	440,218	4.7
New Domestic (Hawaiian & Frontier)	--	118,638	--
All Other Domestic	422,225	390,047	(7.6)
Total Domestic	10,905,889	11,388,477	4.4%

Source: Authority.
* Includes feeder airlines.

The destinations chosen by passengers using the Airport have changed over the years, reflecting the impacts of domestic and international economic cycles, security screening and the relative cost of air travel. While the New York market, which includes traffic to LaGuardia, JFK and Newark, is currently the Airport's largest market, the percentage of passengers traveling by air between Boston and New York/Newark has declined while international traffic and long-haul domestic traffic have increased.

The following table shows the percentage of origin and destination passengers traveling on U.S. air carriers between the Airport and other final domestic destinations for the twelve months ended December 31, 2018 (the most recent 12 month period for which data is available), as reported by USDOT. The percentage of origin and destination passengers does not include passengers only connecting at an airport such as JFK (e.g., JetBlue). Passengers traveling on international flights are also not included. It also shows the comparative rankings of the top 20 domestic destinations for calendar year 2008.

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BOSTON-LOGAN INTERNATIONAL AIRPORT
TOP TWENTY DOMESTIC ORIGIN & DESTINATION PASSENGER MARKETS
DOMESTIC CARRIERS
(12 Months Ended December 31, 2008 and December 31, 2018)

Market	12 Months Ended 12/31/18 (%)	12 Months Ended 12/31/18 Rank	12 Months Ended 12/31/08 Rank	Major U.S. Carriers Serving Market (2018)* # of Carriers	
New York Area (JFK, LGA, EWR) [(1)]	5.9%	1	1	4	AA, D, JB, U
Chicago, IL (ORD, MDW) [(2)]	5.7	2	5	6	AA, D, JB, SW, SP, U
Washington DC (IAD, DCA) [(3)]	5.2	3	2	5	AA, D, JB, SW, U
Los Angeles Area : (LAX and LGB)	5.2	4	6	8	AA, AK, D, JB, SW, SP, SC, U
San Francisco Area : (SFO and SJC)	5.1	5	3	7	AA, AK, D, JB, SW, SC, U
ATL : Atlanta, GA	4.2	6	7	6	AA, D, JB, SW, SP, U
MCO : Orlando, FL	4.1	7	4	6	AA, D, JB, SW, SP, U
BWI : Baltimore, MD	2.8	8	9	6	AA, D, JB, SW, SP, U
FLL : Fort Lauderdale, FL	2.8	9	8	6	AA, D, JB, SW, SP, U
PHL : Philadelphia, PA	2.7	10	23	4	AA, D, JB, U
Dallas/Fort Worth, TX (DFW & DAL) [(4)]	2.7	11	13	8	AA, AK, D, JB, SW, SP, SC, U
DEN : Denver, CO	2.5	12	12	8	AA, AK, D, JB, SW, SP, SC, U
TPA : Tampa, FL	2.3	13	10	6	AA, D, JB, SW, SP, U
MSP: Minneapolis, MN	2.2	14	16	7	AA, D, JB, SW, SP, SC, U
RSW : Fort Myers, FL	2.1	15	11	7	AA, D, JB, SW, SP, SC, U
SEA : Seattle, WA	2.0	16	17	8	AA, AK, D, JB, SW, SP, SC, U
Houston, TX (IAH & HOU) [(5)]	1.9	17	22	6	AA, D, JB, SW, SP, U
PBI: West Palm Beach, FL	1.8	18	14	6	AA, D, JB, SW, SP, U
RDU : Raleigh/Durham, NC	1.8	19	20	5	AA, D, JB, SW, U
LAS : Las Vegas, NV	1.8	20	15	8	AA, AK, D, JB, SW, SP, SC, U
Total for Cities Listed	64.8%				

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

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

(3) Includes Dulles Airport & National Airport.

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

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

Source: Airline Data Inc.: USDOT, O&D Survey.

* Reflects all carriers providing service to the listed market; includes those that do not provide direct point-to-point service to/from Logan.
Key: American/USAir (AA); Alaska (AK); Delta (D); JetBlue (JB); Southwest (SW); Spirit Airlines (SP); Sun Country (SC); United (U).

Note: The figures above may vary slightly from those reflected in Exhibit 4-22 of Appendix C – Boston Logan International Airport Market Analysis (the "*ICF Report*") due to differences in the proprietary data processing methods used by Airline Data Inc. (the source for the data above) and Database Products (the source for the data in the ICF Report) to scale-up the U.S. DOT O&D Survey data.

In calendar year 2018, the top five international markets served (by scheduled seats) were London, Toronto, Dublin, Paris and Reykjavik. New international service from the Airport to the following destinations commenced since 2012*:

Destination	**Service Commencement Date**	**Carrier**
Tokyo	April 2012	Japan Airlines
Panama City	July 2013	Copa Airlines
Dubai	March 2014	Emirates
Istanbul	May 2014	Turkish Airlines
Beijing	June 2014	Hainan Airlines
Hong Kong	May 2015	Cathay Pacific
Tel Aviv	June 2015	El AL
Shanghai	June 2015	Hainan Airlines
Doha	March 2016	Qatar Airlines
Copenhagen	March 2016	Scandinavian (SAS)
London Gatwick	March 2016	Norwegian Air
Toronto	March 2016	WestJet
Halifax	April 2016	WestJet
Manchester, England	March 2017	Virgin Atlantic
Lisbon	June 2016	TAP-Portugal
Vancouver	June 2017	Air Canada
Praia	January 2018	TACV Cabo Verde
Barcelona	March 2018	Level
Paris	May 2018	Norwegian AS
Aruba	June 2018	Delta
Sao Paulo	July 2018	LATAM
Mexico City	October 2018	JetBlue
Havana	November 2018	JetBlue
Amsterdam	March 2019	KLM Royal Dutch Airlines
Rome	March 2019	Norwegian UK
Seoul	April 2019	Korean Air
Edinburgh	May 2019	Delta
Lisbon	May 2019	Delta
Madrid	May 2019	Norwegian UK
Casablanca	June 2019†	Royal Air Maroc

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

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

Airport Passengers
(in millions)

Airport	2014	*% of Total*	2015	*% of Total*	2016	*% of Total*	2017	*% of Total*	2018	*% of Total*	(2017-18) % Change
Logan Airport	31.6	*84.8%*	33.5	*85.5%*	36.3	*86.5%*	38.4	*86.9%*	40.9	*87.0%*	6.6%
T.F. Green	3.6	*9.6*	3.6	*9.2*	3.7	*8.7*	3.9	*8.8*	4.3	*9.1*	9.2
Manchester	2.1	*5.6*	2.1	*5.3*	2.0	*4.8*	1.9	*4.3*	1.8	*3.9*	(6.9)
Total	**37.3**		**39.2**		**42.0**		**44.2**		**47.0**		

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

Cargo Airline Services. The Airport plays an important role as a center for processing domestic and international air cargo. According to ACI, in reporting year 2017 (the most recent year for which data is available), the Airport ranked 22nd in North America in total air cargo volume. As of June 30, 2018, the Airport was served by seven all-cargo and small package/express carriers. All-cargo carriers carry only cargo and these companies include ABX Air, Atlas, Air Transport International, Federal Express, Mountain Air Cargo, United Parcel Service and Wiggins Airways. For fiscal year 2018, the companies with the largest shares of enplaned and deplaned cargo at the Airport, based upon cargo tonnage, were Federal Express, United Parcel Service, Delta, Atlas Air, British Airways and Lufthansa German Airlines. Together, these six carriers accounted for 69.2% of total cargo and mail handled at the Airport in fiscal year 2018.

Cargo and Mail Traffic. In fiscal year 2018, total combined cargo and mail volume was approximately 727.2 million pounds. Total volume consisted of 53.4% small package/express, 42.2% freight and 4.4% mail. The total volume of air cargo and mail handled at the Airport increased in fiscal year 2018 by 8.1% compared to fiscal year 2017 and increased by 10.9% in fiscal year 2017 relative to fiscal year 2016. Fiscal year 2018 cargo and mail volume was 27.1% above that of fiscal year 2014. A large percentage of total cargo volume for these periods is attributable to integrated all-cargo companies and small package/express carriers. The integrated all-cargo companies, which include Federal Express and United Parcel Service, handled approximately 54.2% of the Airport's cargo in fiscal year 2018 and 54.9% in fiscal year 2017.

Airport Facilities

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

Runway	Length (ft)	EMAS	Status Lights	Inclined Safety Area	Foreign Object Debris Detection System
15R/33L	10,083	Yes – at 33L	Yes (THL, RIL, REL)	--	--
4R/22L	10,006	--	Yes (REL)	Yes – at 22L	--
4L/22R	7,864	Yes – at 22R	Yes (REL)	Yes – at 22R	--
9/27	7,001	--	Yes (THL, RIL, REL)	Yes – at 27	Yes
14/32	5,000	--	--	--	--
15L/33R	2,557	--	--	--	--

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

The Authority is planning significant airside facility renovations and enhancements to the Airport as part of the FY19-FY23 Capital Program. See "CAPITAL PROGRAM" herein.

Terminal Facilities. The Airport has four commercial passenger terminals (the "*Terminals*") that provide 97 contact gates. The Airport also has general aviation facilities located in the North Cargo Area currently occupied by Signature Flight Support. As of May 1, 2019, the Terminals in operation included:

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

Terminal B. Terminal B is the largest terminal at Logan with 37 contact gates, or 38% of total Airport gates. Terminal B is used by Air Canada, American/American Shuttle, Boutique Air, Spirit Airlines and United/United Express.

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

Terminal E. Terminal E, which has 12 gates, including three gates providing two-level jet bridges that can accommodate Group VI aircraft, is used for all arriving international flights requiring federal inspection services and most departures by foreign flag carriers. The majority of charter flights utilize Terminal E, although charter flights also operate from other Terminals. In addition, JetBlue leases three gates in Terminal E on a preferential basis for 12 hour per day.

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

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

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

The table below reflects the Authority's current lease arrangements for contact gates at the Airport. In addition to those listed below, five gates are currently closed for renovations in Terminal B, and one gate in Terminal C and all of the gates in Terminal E are currently common use facilities that are not leased to any carrier. The Authority anticipates the five closed gates in Terminal B will be re-opened and subsequently leased to Southwest in calendar year 2019 (see "CAPITAL PROGRAM – Authority Funded Capital Projects – Logan Airport Improvements – *Improvements to Accommodate Airline Consolidation and Domestic Travel Growth at Logan*" herein).

Terminal	Carrier	# of Contact Gates	Lease Term	Expiration Date
Terminal A	Delta	16	1 year	*
	Southwest	5	Monthly	n/a
Terminal B	American	8†	20 years	June 13, 2021
		13†	25 years	September 30, 2023
	Spirit	2	Monthly	n/a
	United	9	1 year	**
Terminal C	Alaska	2	Monthly	n/a
	JetBlue	24‡	1 year	***
	Total:	**79**		

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

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

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

† American subleases three gates to Air Canada.

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

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

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

Parking Facilities. Private automobiles are one of the primary means of ground transportation to and from the Airport. Based upon a 2016 air passenger survey, the Authority estimates that approximately 34.5% of all air passengers arrive at Logan Airport in private automobiles, and of those, approximately 33.1% (or 11.4% of total passengers) use the Airport's parking facilities for long-term duration parking. While overall demand for on-airport parking continues to increase, there has been growth in the use of high occupancy vehicles ("*HOV*") and transportation network companies ("*TNCs*") and declines in Logan air passenger private vehicle use. A majority of the decline in air passenger private vehicle use is from the use of TNCs, limousines and HOVs, including private buses and Framingham and Braintree Logan Express park-and-ride services. For a further discussion on the impact of TNCs on the Airport, see "AVIATION INDUSTRY CONSIDERATIONS – Technological Innovations in Ground Transportation."

The number of on-Airport commercial and employee parking spaces is currently limited to 26,088, of which 23,640 spaces are currently designated for commercial use and 2,448 spaces for employee parking. These limitations (the "*SIP Parking Limitation*") are pursuant to the State Implementation Plan ("*SIP*") filed by the Commonwealth in 1975 (and amended in 1990) with the United States Environmental Protection Agency ("*EPA*") under the federal Clean Air Act, as amended in 2017 pursuant to approvals by the Massachusetts Department of Environmental Protection (the "*DEP*") and the EPA to increase the permitted number of spaces by 5,000. Under the Airport SIP Parking Limitation, the Authority may shift the location of on-Airport parking spaces or convert the use of spaces from employee use to commercial use. Once parking spaces have been converted from employee to commercial use, however, they cannot be converted back to employee use. There is no regulatory limit on the number of parking spaces that are available to the rental car industry at the Airport.

Now that the Airport SIP Parking Limitation has been increased, the Authority is moving forward with its Logan Airport parking program, which includes the design and construction of up to 5,000 new parking spaces, which are expected to be distributed between the existing Terminal E surface parking lot and the existing Economy Parking Garage. The FY19-FY23 Capital Program includes $120 million to fund development of the first 2,000 parking spaces, which construction is expected to commence upon receipt by the Authority of all necessary environmental approvals. For information regarding the additional planned parking improvements, see "CAPITAL PROGRAM – Authority Funded Capital Projects – Logan Airport Improvements – *Improvements to Facilitate Airport Parking*" herein.

The Board has approved increases in parking rates through July 1, 2021 to support the operational and capital construction needs of the Airport, including, in particular, to support the new debt and increase in pay-as-you-go capital required under the FY19-FY23 Capital Program. See "CAPITAL PROGRAM" herein. In particular, the Board voted to increase Logan Airport parking rates by $3.00 per day effective July 1 in each of the years 2016, 2017, 2019 and 2021. These increases impact all on-Airport commercial parking, including the Economy Parking Garage, as reflected below:

Logan Airport
Maximum Daily Parking Rates
(Effective July 1,)

	# of Spaces as of 3/31/2019	**2015**	**2016**	**2017**	**2019**	**2021**
Central Parking Garage	12,494	$29.00	$32.00	$35.00	$38.00	$41.00
Terminal B Garage	2,212	29.00	32.00	35.00	38.00	41.00
Terminal E Lots	486	29.00	32.00	35.00	38.00	41.00
Economy Parking	3,081	20.00	23.00	26.00	29.00	32.00

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

Cargo Facilities. As of June 30, 2018, Logan Airport's cargo facilities include six buildings containing approximately 273,556 square feet of warehouse space. Tenants of cargo facilities at the Airport include Federal Express (occupying 99,564 square feet of warehouse space), American, United, Delta, Quantum Aviation Services, United Parcel Service, Southwest, Swissport and Worldwide Flight Services. The majority of the remaining cargo and passenger airlines contract services with the above listed cargo processing tenants in various areas of the Airport.

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

Service and Support Facilities. Airport service and support facilities currently include two facilities for preparation of in-flight meals, a Hilton hotel, a Hyatt conference center and hotel and five aircraft maintenance hangars. In addition, the Rental Car Center ("*RCC*"), which opened in September 2013, provides integrated airport-related rental car operations and facilities by consolidating at the RCC all 12 rental car brands serving the Airport. The RCC is a consolidated rental car facility, consisting of a four-level garage with ready/return spaces, a customer service center, seven acres of quick-turn-around ("*QTA*") fueling and cleaning facilities and nine acres of on-site rental car storage. The RCC is served by a common bus fleet of clean fuel vehicles that also serves the MBTA Blue Line (Airport Station) riders. See "Ground Access to the Airport" below.

In addition, the Authority operates field maintenance facilities, a water pumping station, electrical sub-stations and distribution system, and a plant that supplies steam, hot water and chilled water. The Authority currently has a long-term agreement with Eversource Energy, pursuant to which Eversource Energy provides local network distribution services to the Authority. With respect to electric supply, the Authority currently has Master Power Agreements in place with five suppliers for a term of six years beginning on January 1, 2016, and currently has transaction agreements for base load supply in place with two of these suppliers through December 31, 2021. Additionally, the Authority purchases ancillary services and a portion of its electricity needs from the Independent Systems Operator of New England (ISO-NE) managed energy markets.

The Authority has installed in excess of 900kw of renewable energy generation systems on its properties. In fiscal year 2018, these generation sites produced in excess of 1,000 MWh of electricity, offsetting 744 metric tons of Carbon Dioxide (CO_2) equivalent. The Authority's renewable energy generation portfolio includes both wind and solar generation systems. These projects are funded internally as well as through a long-term power purchase agreement generated through a public/private partnership.

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

In an effort to reduce congestion, the Authority encourages the use of High Occupancy Vehicle ("*HOV*") modes in an effort to reduce congestion on the roadways at and around the Airport. There are many HOV options to access the Airport, including private regional bus companies, the Massachusetts Bay Transportation Authority's ("*MBTA*") Blue Line subway, the MBTA Silver Line (which is free for passengers leaving the Airport with connections to the MBTA Red Line subway at South Station and the MBTA commuter rail), MBTA scheduled water shuttle service, and the Authority's Logan Express ("*Logan Express*" or "*LEX*") service, which offers scheduled motor coach service between the Airport and four suburban park-and-ride locations: Framingham, Braintree, Woburn and Peabody.

The Authority encourages the use of alternatives to private automobile transportation through public information and advertising campaigns and the development of reliable and innovative alternative transportation services. To further encourage the use of its Logan Express service, the Authority has expanded the number of service hours at all four suburban locations, and expects to increase service frequencies throughout the Logan Express network in fiscal year 2019. In addition to service improvements, the Authority has made significant investments in Logan Express facilities, most notably the acquisition of the Braintree Logan Express site ($47.1 million) in 2014 as well as the construction of a new 1,100 space garage ($39.5 million) at its Framingham site in 2015.

The Authority is undertaking a comprehensive Ground Transportation Plan that aims to double LEX ridership from 1.9 million to 4.0 million passengers. This plan involves a significant investment of resources to implement the following major initiatives:

1. Revitalize Back Bay Logan Express service by changing the location from Copley to the MBTA's Back Bay Station, discounting the existing fare from $7.50 each way to free from Logan Airport and $3.00 to Logan Airport, and piloting priority access to the security checkpoint lines for riders, with a commencement date of May 1, 2019.

2. Start a new urban Logan Express service from North Station by the first quarter of 2020, with the same fare structure as the revitalized Back Bay LEX service (free from Logan Airport and $3.00 to Logan Airport) with the service running every 20 minutes during operating hours.

3. Improve service and amenities at existing suburban LEX sites, such as increasing service frequencies at Braintree from every 30 minute service to every 20 minutes (commencing May 1, 2019) and further evaluate the construction of additional commercial parking capacity at existing sites.

4. Identify and commence service from a new suburban Logan Express location.

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

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

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

Hanscom Field

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

Hanscom Field is a corporate jet reliever for Logan Airport. It is anticipated that Hanscom Field will continue to develop as an alternative to the Airport for general aviation and may accommodate niche commercial passenger service. General aviation operations, including business-related activity, charters and light cargo, as well as flight training and recreational flying, currently represent 99% of the activity at Hanscom Field; military aircraft conduct less than 1% of the operations. For fiscal year 2018, Hanscom Field reported 126,188 total operations, of which 45,300 operations were local (Touch and Go), 28,705 were single engine operations and 30,815 were jet operations. For fiscal year 2019, through March 31, 2019, Hanscom Field reported 88,721 total operations, of which 30,275 operations were local (Touch and Go), 19,667 were single engine operations and 22,962 were jet operations. By comparison, for the same period of fiscal year 2018 (through March 31, 2018), Hanscom Field reported 92,261 total operations, of which 33,649 operations were local (Touch and Go), 20,786 were single engine operations and 22,555 were jet operations. The airfield is currently served by three full service fixed base operators, as well as several limited service fixed base operators. As of March 31, 2019, Hanscom Field had 285 aircraft based on site.

Worcester Regional Airport

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

As of March 31, 2019, Worcester Regional Airport had 63 aircraft based on site and a total of 22,533 operations were recorded for fiscal year 2018, ranging from small single-engine aircraft to large corporate business jets to one large commercial airline (JetBlue). For fiscal year 2019, through March 31, 2019, Worcester Regional Airport reported a total of 14,996 operations. By comparison, as of March 31, 2018, Worcester Regional Airport had 65 aircraft based on site and a total of 17,638 operations for the same nine months of fiscal year 2018. The recent decline in general aviation operations at Worcester Regional Airport is consistent with downward trending national averages. In November 2012, Rectrix Commercial Aviation Services, Inc. ("*Rectrix*") began operating as a full service fixed based operator at Worcester Regional Airport. Ross Aviation acquired Rectrix in February 2019. Rectrix will remain branded as such, and there are expected to be no changes in daily operations at Worcester. Rectrix operates out of a 27,000 square foot facility that was newly constructed and completed in November 2015, providing full service fixed base operations as well as the base for the maintenance operation for its growing corporate fleet.

On November 7, 2013, JetBlue began commercial service from Worcester Regional Airport. Since commencement of service, it has served over 640,000 passengers, including 109,911 passengers in calendar year 2017 and 135,070 passengers in calendar year 2018. JetBlue currently provides three daily flights—two to Florida and one to New York's JFK airport—providing several connecting options throughout the country and internationally with its interline partners. The Authority continues to actively engage in recruiting additional commercial airlines to serve Worcester Regional Airport. In October 2018, American began twice daily service to its Philadelphia hub, providing in excess of 140 connecting opportunities to dozens of domestic, Caribbean/Latin American and European markets. In the spring of 2019, American reduced its Philadelphia service to once daily; however, American has indicated that it remains committed to Worcester. Delta recently announced daily service from Worcester Regional Airport to its Detroit hub beginning in August 2019. This service will further enhance connecting opportunities that JetBlue and American are offering by enhancing east/west and Far East routes.

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

PORT PROPERTIES

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

Properties as an important component of its goal to facilitate the participation of the Massachusetts economy in international trade and tourism.

In fiscal year 2018, the Port Properties accounted for approximately 14.7% of the Authority's Revenues and approximately 7.1% of the Authority's Net Revenues (as defined in the 1978 Trust Agreement).

Maritime Properties

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

A map of the Authority's maritime properties is set forth on the following page.

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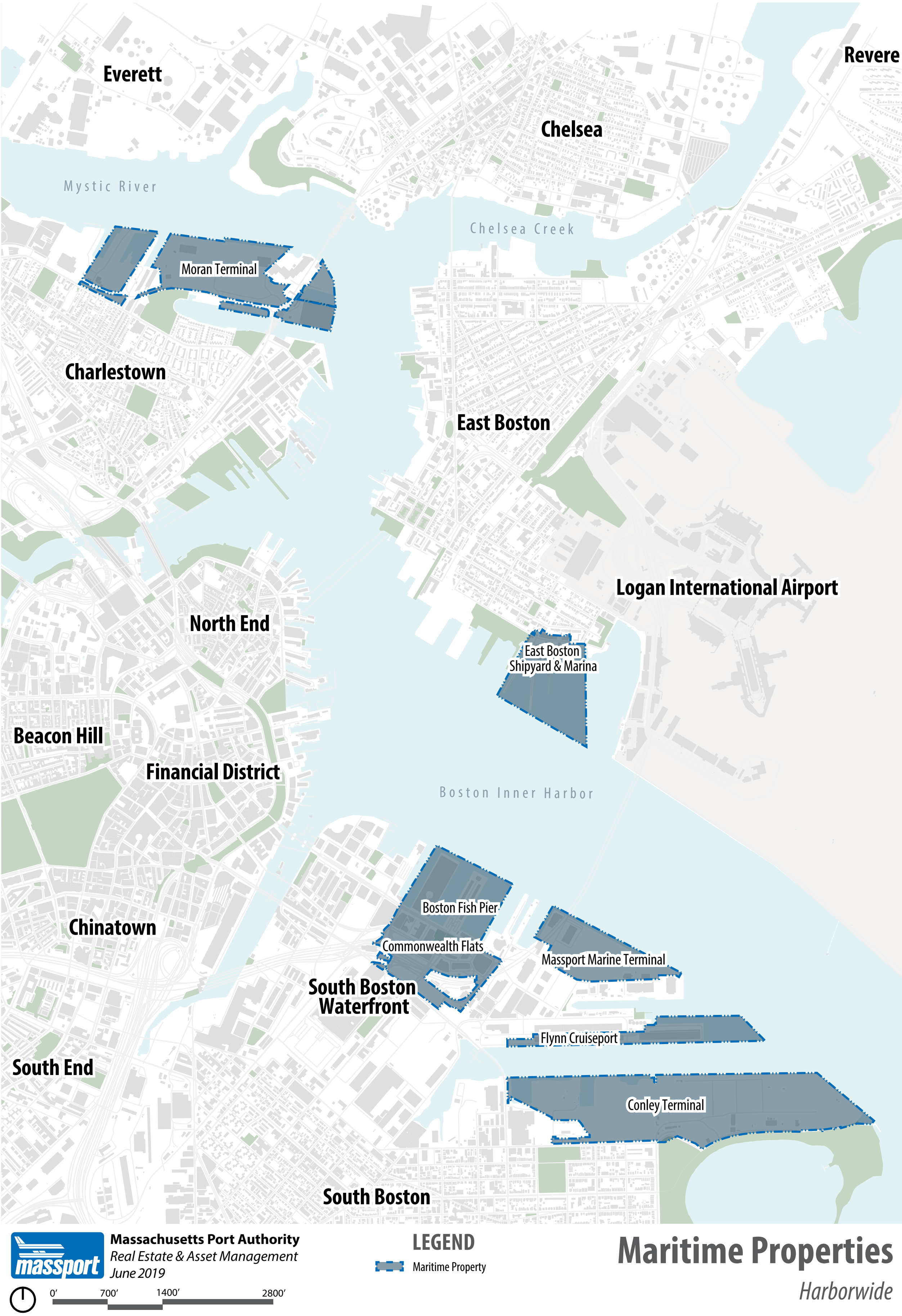
Everett
Revere
Chelsea
Mystic River
Chelsea Creek
Moran Terminal
Charlestown
East Boston
Logan International Airport
North End
East Boston
Shipyard & Marina
Beacon Hill
Financial District
Boston Inner Harbor
Boston Fish Pier
Chinatown
Commonwealth Flats
Massport Marine Terminal
South Boston
Waterfront
Flynn Cruiseport
South End
Conley Terminal
South Boston
Massachusetts Port Authority
Real Estate & Asset Management
June 2019
massport
0'
700'
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LEGEND
Maritime Property
Maritime Properties
Harborwide

Cargo activity during fiscal years 2014 through 2018 and for the nine-month periods ending March 31, 2018 and March 31, 2019 is summarized in the table below. The increase in containers for fiscal year 2018 reflects the realigned Asian services taking effect in May 2017, in which two Asian vessels began using the Port instead of one.

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

Port Activity	2014	2015	2016	2017	2018	Nine Months Ended 3/31/2018	Nine Months Ended 3/31/2019
Containers (1)	116,800	125,809	140,967	145,540	161,130	122,303	130,918
Automobiles (2)	57,662	57,522	59,740	48,983	52,736	41,885	37,607
Bulk Tonnage	182,714	155,415	110,673	110,480	82,868	67,493	68,924

(1) Does not include over-the-road volumes.
(2) Does not include vehicles entered by over-the-road means.
Source: Authority reports.

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

According to the most recent economic impact study of the Port of Boston, which was released in June 2019, the Port generated an estimated $8.2 billion in economic activity in calendar year 2018, up from $4.6 billion in calendar year 2012. The study further states that Port activities generated 66,000 total jobs in calendar year 2018 (an increase of 32% from calendar year 2012), including 9,000 direct jobs (up 30% from calendar year 2012).

Conley Terminal. Conley Terminal, a 101-acre facility in South Boston, is served via direct call by nine of the world's top ocean carriers: APL, China Ocean Shipping Corporation Limited ("*COSCO Shipping*"), CMA CGM, Evergreen Line, Hapag-Lloyd, Mediterranean Shipping Company, Ocean Network Express ("*ONE*"), OOCL and Yang Ming Line. Container volume is closely tied to overall economic conditions in Massachusetts, New England and international markets. As of June 30, 2018, the Port of Boston was ranked as the 11th largest container port on the Atlantic Coast of the U.S. by container volume. The Authority estimates that one-third of New England bound cargo moves through Conley Terminal. Its efficient connectivity to the state's interstate highway system allows for almost no congestion at the terminal, resulting in truck turn times of approximately 35 minutes. Businesses relying on Conley Terminal for import and export of their goods are located throughout New England, including the following Massachusetts businesses:

Shipper	Commodity
Autopart International	Auto Parts
BJ's Wholesale Club	General Merchandise
Bob's Discount Furniture	Furniture
Boston Hides and Furs	Hides
Eastern Fisheries	Seafood
Horizon Beverage	Wines/ Spirits
International Forest Products (Kraft Group)	Recoverable Paper
Jordan's Furniture	Furniture
King City Forwarding USA	Logs/ Lumber
Nantucket Distributing	General Merchandise
Ocean State Job Lot	General Merchandise
Rolf C. Hagen	Pet Supplies
Ruby Wines	Wines/ Spirits
Schnitzer Steel	Scrap Metal
Staples	General Merchandise
United Liquors	Wines/ Spirits

Conley Terminal has seen steady growth in the number of containers handled annually, as reflected in the table entitled "Port of Boston Container Activity" above. In addition, the volume of cargo handled continues to increase. In fiscal year 2018, Conley Terminal marked its fourth straight record year with a total of 283,720 TEUs[1] handled, up 10.4% over fiscal year 2017. TEU growth at Conley Terminal for fiscal years 2014 through 2018 is summarized in the table below.

CONLEY TERMINAL
TEUs PROCESSED
(Fiscal Year Ended June 30)
(in thousands)

Fiscal Year	TEUs
2014	204.0
2015	221.0
2016	247.3
2017	257.0
2018*	283.7
2019**	230.4

* The increase in TEUs processed for fiscal year 2018 reflects the realigned Asian services taking effect in May 2017, pursuant to which 8,500 TEU ships are now calling on Conley Terminal weekly.

** Reflects TEUs processed through March 2019.

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

The Deep Draft Project is expected to cost approximately $327.0 million. The federal government is responsible for approximately $220.0 million of the total cost, which will be facilitated through appropriations by the United States Congress to the USACE's budget; the remaining $107.0 million will be funded by the Commonwealth's MassDOT ($75.0 million) and the Authority ($32.0 million). The $32.0 million expected to be financed with Authority funds is included in the FY19-FY23 Capital Program. See "CAPITAL PROGRAM – Authority Funded Capital Projects – Maritime Improvements." Of the $75.0 million of Commonwealth MassDOT funding described above, the Authority received $5.0 million in fiscal year 2016 for maintenance dredging and CAD cell construction and $30.0 million and $35.0 million for improvement dredging in fiscal years 2018 and 2019, respectively. It expects to receive the remaining $5.0 million in fiscal year 2020. The Deep Draft Project was allocated a new construction start and appropriated $18.2 million in federal funding in the USACE's FY17 work plan and $58.0 million in the USACE's FY18 work plan, and an additional $15.1 million in federal funding has been budgeted for the UCACE's FY19 work plan. With this designation and funding, the Authority, MassDOT, and the USACE entered into a Project Partnership Agreement ("*Deep Draft PPA*") in September 2017. The Deep Draft PPA describes the project and the responsibilities of (i) the Federal government acting by and through the USACE, and (ii) the Authority and MassDOT, as the non-Federal sponsors, in the cost sharing and execution of work for the Deep Draft Project.

In addition to the Deep Draft Project, the Authority is undertaking several Conley Terminal modernization projects on the landside. Completed projects to date include (i) construction of a dedicated freight corridor (the Thomas Butler Bypass Road) to service Conley Terminal, which opened in September 2017; (ii) Berth 12 maintenance dredging; (iii) installation of a new fender system at Berth 12; (iv) procurement of yard tractor replacements; (v) installation of rubber tire gantry (RTG) replacement drives; (vi) expansion of refrigerated container storage; and (vii)

[1] A twenty-foot equivalent unit (TEU) is an inexact unit of cargo capacity often used to describe the capacity of container ships and container terminals. It is based on the volume of a 20-foot-long (6.1 m) intermodal container, a standard-sized metal box which can be easily transferred between different modes of transportation, such as ships, trains and trucks.

installation of wi-fi and LED lighting technologies. Additional improvements to be undertaken or currently underway at Conley Terminal include Berth 11 rehabilitation, Berths 11 and 12 backland repairs, procurement of yard tractor replacements, Berths 14-17 bulkhead rehabilitation, new gate processing facilities, and the build-out of container storage behind Berth 10. Finally, the Authority is expanding Conley Terminal onto the adjacent property acquired by the Authority in December 2008 by building a new, deepwater Berth 10 with larger cranes and deepening the existing Berth 11. The Deep Draft PPA requires the Authority, at its sole cost, to dredge two (2) berths at the Conley Terminal to a depth of 50 feet each, and the FY19-FY23 Capital Program includes funding for the construction of Berth 10 and the dredging of Berths 10 and 11 to such depth.

The Conley Terminal landside improvements discussed in the preceding paragraph are currently expected to cost a total of approximately $392.9 million, consisting of (i) $75.0 million for the construction of the dedicated freight corridor and enabling projects, (ii) $102.9 million for the Conley Terminal infrastructure repairs and equipment upgrades as well as the dredging of Berth 11, and (iii) $215.0 million relating to the construction of Berth 10 and the purchase and installation of three new cranes large enough to serve the ships calling on Conley Terminal, currently and in the future. The dedicated freight corridor has been completed and was funded by the Authority's internally generated funds. With respect to the Conley Terminal infrastructure repairs, equipment upgrades and Berth 11 dredging, the Authority was awarded a $42.0 million FASTLANE grant by the USDOT in fiscal year 2016 to pay for a portion of the $102.9 million total project costs. The Authority is financing the remaining $60.9 million of these project costs with a combination of Authority funds ($60.3 million), and EPA grant funds ($0.6 million). See "CAPITAL PROGRAM – Authority Funded Capital Projects – Maritime Improvements." The Berth 10 construction and the procurement of the three new cranes is expected to be funded with a combination of (i) Commonwealth funds in the amount of $107.5 million (the "*Commonwealth Contribution*"), which funding amount was authorized by the Commonwealth in its 2016 Economic Development Bond Bill, (ii) Bond proceeds ($93.3), and (iii) Authority funds ($14.2 million). In May 2018, the Authority executed a Memorandum of Understanding (the "*Conley Terminal MOU*") with the Commonwealth to receive the Commonwealth Contribution over a three-year period from fiscal year 2020 to fiscal year 2022. Pursuant to the Conley Terminal MOU, the Commonwealth has acknowledged and agreed to pay the Commonwealth Contribution in accordance with the schedule set forth therein, provided that if (a) the scope of the project materially changes, (b) the budget for the project materially changes or (c) the project is subject to significant delays for reasons beyond the control of the Authority, the Commonwealth reserves the right to postpone any of its scheduled payments while the parties work collaboratively to analyze the effect of such impacts on the project and if and how the project shall proceed. To accelerate construction for the project, in November 2018, the Authority issued a series of subordinated obligations to provide bridge financing for the project, pending receipt of the Commonwealth Contribution. See "CAPITAL PROGRAM – Authority Funded Capital Project – Maritime Improvements," "CAPITAL PROGRAM – Funding Sources," and "OTHER OBLIGATIONS – Subordinated Indebtedness" herein. It is currently expected that the construction of Berth 10 and the procurement and installation of the three new cranes will be completed by the end of calendar year 2020.

The Authority expects to leverage the revenues derived from its real estate assets in South Boston to fund its share of the capital improvement projects at Conley Terminal discussed above, which revenues are included in the Revenues pledged under the 1978 Trust Agreement that secure the Bonds. In particular, the Authority is working with the private sector to develop six of the Authority's South Boston parcels, and the Authority expects to apply the additional long-term ground lease and parking revenues from these commercial developments to finance Conley Terminal improvements, including Berth 10 construction and the supporting backlands repairs and equipment. These commercial projects are in various stages of the development process, with completion of three parcels scheduled in the next two years: (1) the South Boston Waterfront Transportation Center, a 1,550 space parking garage owned by the Authority, was completed and opened to the public in May 2018; (2) Gables Seaport (Parcel C-1), a private mixed use residential/retail development, is expected to be completed by the middle of calendar year 2020; and (3) the Omni Summer Street Hotel (Parcel D-2), an approximately 1,050-room luxury hotel, which is expected to open in early calendar year 2021. The Authority designated a developer for the Parcel A-2 development in November 2018, with the development expected to come online by the end of calendar year 2022. Requests for Proposals for the remaining two parcels, Parcel H and Parcel D-3, are expected to be released within the next two years. See "PORT PROPERTIES – Commercial and Maritime Real Estate Properties," "CAPITAL PROGRAM – Authority Funded Projects – Real Estate Improvements" and "CAPITAL PROGRAM – Third Party Funded Capital Projects" for a further description of the Authority's ongoing real estate developments.

Boston Autoport. This 80-acre facility in Charlestown is leased to Boston Autoport LLC ("*Boston Autoport*") through June 2051. Boston Autoport is the only automobile processing entity using the Port. Boston Autoport imports and stores Subarus and other automobiles and also exports used automobiles. Vehicle imports into the Boston Autoport have trended up in recent years. It also pursues other complementary marine industrial subtenants, which generate additional revenue on the property. Currently Boston Autoport is home to nine businesses with over 500 employees. One of its larger subtenants is the Massachusetts Clean Energy Technology Center, which operates a 46,000 square foot facility to test wind blades to meet certification and investor requirements and support wind industry research and development activities. The Massachusetts Clean Energy Technology Center is one of the largest such facilities in North America and has been in operation since 2011. Other maritime industrial uses at Boston Autoport include import, storage, mixing and distribution of road salt; passenger water transportation vessel service and layover; and marine and vehicle fueling.

Flynn Cruiseport Boston. Formerly called the Black Falcon Cruise Terminal, this 387,000 square foot terminal at the former Boston Army Base in South Boston originally served as a supplies warehouse before being converted to a cruise terminal in 1986. Cruise activity from the Port of Boston includes sailings to Bermuda, multiple locations in Canada and limited sailings to the Caribbean. Holland America Line, Norwegian Cruise Line, and Royal Caribbean are providing the five home-ported vessels calling on Flynn Cruiseport Boston in calendar year 2019. The table below reflects total passenger volume at Flynn Cruiseport Boston for each of fiscal years 2014 through 2018. Passenger growth has been driven by the expansion of the cruise season, the introduction of new cruise itineraries and the introduction of new ships into the Boston market.

FLYNN CRUISEPORT BOSTON VESSEL AND PASSENGER VOLUME
(Fiscal Year Ended June 30)

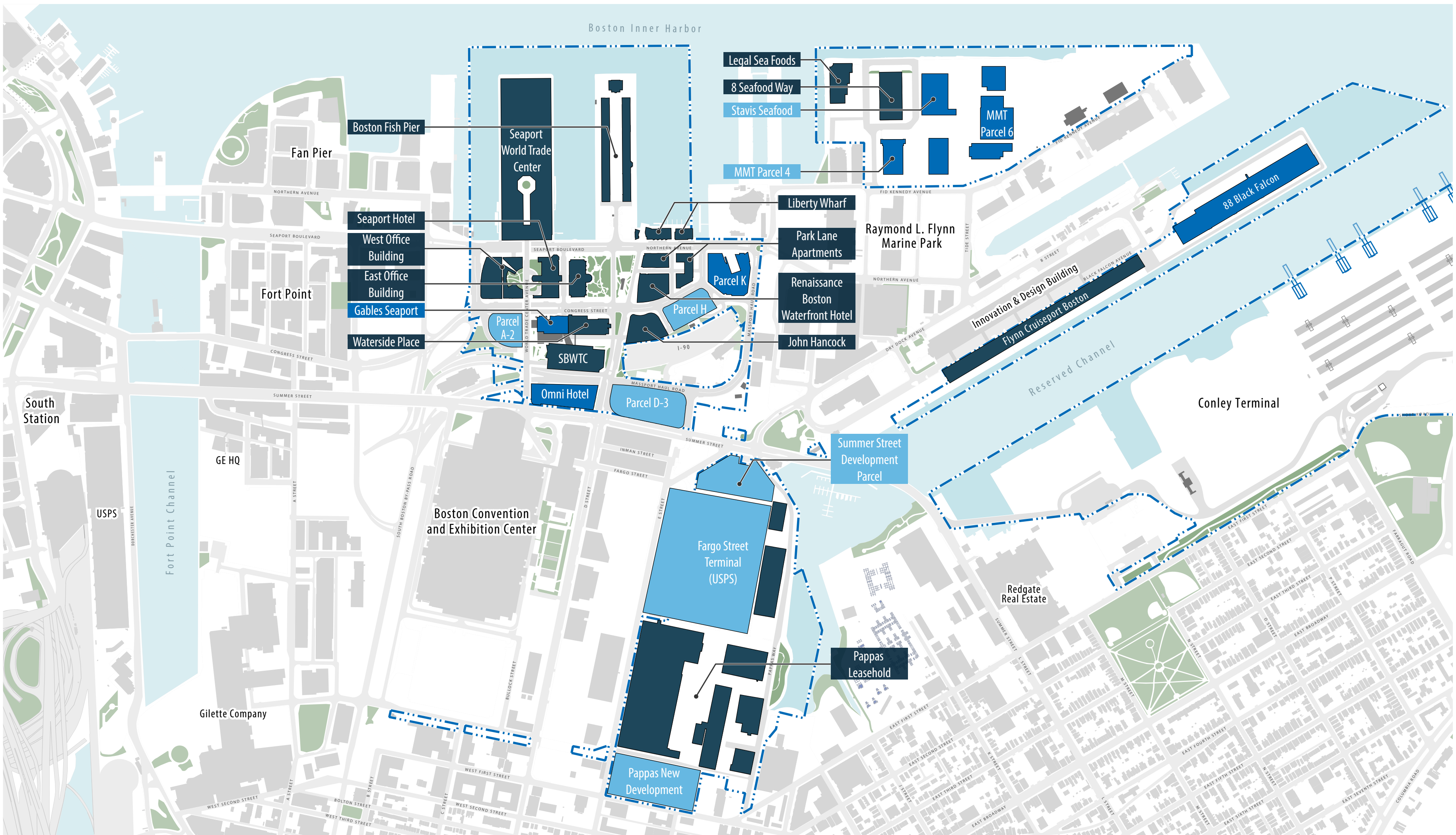
	# of Calls	Total Passengers
2014	109	338,442
2015	117	330,535
2016	107	289,076*
2017	124	351,914
2018	159	406,369

* The decrease in total passengers in fiscal year 2016 was a result of the Norwegian Dawn undergoing extensive renovation that delayed the first call and resulted in six missed turns.

The Authority expects to make additional investments to upgrade and expand Flynn Cruiseport Boston in order to better position the facility to capture future growth opportunities. In particular, while the Authority has invested approximately $26.0 million in capital improvements in the terminal since 2011, much of the building remains unimproved and the terminal remains incapable of servicing multiple larger (4,000 to 5,000 passenger) cruise ships. Most ships docking at Flynn Cruiseport today carry 2,500 passengers. In addition, the current facility can only serve one homeport ship and two port of calls at a time. The Authority is considering potential capital investments at Flynn Cruiseport in an amount up to $100.0 million, including (i) expansion of the terminal facility to provide for a second homeport terminal capable of serving 4,000+ passenger vessels, (ii) upgraded HVAC to facilitate year-round cruise offerings, (iii) new customs and border protection facilities, and (iv) emissions reduction initiatives. The total cost of the above-described improvements is expected to be approximately $100.0 million, of which $10.0 million is included in the FY19-FY 23 Capital Program. See "CAPITAL PROGRAM – Authority Funded Capital Projects – Maritime Improvements." The Authority is still considering various funding options for the remaining projects, which could include potential funding from the Commonwealth as set forth in the fiscal year 2018 Economic Development Bill. These additional projects may be included in a future capital program.

Commercial and Maritime Real Estate Properties

In addition to the above-mentioned maritime properties, the Authority also plans, develops and manages various real estate properties in the Port for maritime, industrial and commercial uses. A map of the Authority's commercial and maritime real estate properties located in South Boston is set forth on the following page.



Massachusetts Port Authority
Real Estate & Asset Management
June 2019

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LEGEND

- Existing Massport Projects
- In Progress Massport Projects
- Future Massport Projects
- Massport Property

Massport Projects
Existing & Future
South Boston, MA

South Boston Commercial and Residential Development. The Authority owns approximately 65 acres of land in the South Boston Waterfront (the "*Waterfront*"), also known as Boston's Seaport District, on which as of the date hereof approximately 5.6 million square feet of commercial development has been built, including office, hotel, retail/restaurant, and meeting space. Development in the Waterfront has been experiencing rapid growth of commercial construction, building openings, major tenant relocations and land transactions. The Authority has actively redeveloped a significant portion of its land in the Waterfront as part of a larger mixed-used plan ultimately expected to result in approximately nine million square feet of office, hotel, restaurant/retail and residential development on the Authority's property.

Since the mid-1980s, completed projects on Authority land that is ground leased to developers include the World Trade Center/Commonwealth Pier (250,000 square feet of exhibition and conference space and 600,000 square feet of office space), the Seaport Hotel (427 rooms), the East and West Office Buildings (490,000 square feet and 560,000 square feet, respectively), the former headquarters of John Hancock Insurance (471,000 square feet), the Boston Harbor Industrial Development leasehold (784,000 square feet), the Park Lane Seaport Apartments (465 apartment units), the Renaissance Boston Waterfront Hotel (471 rooms), and the construction of new roadways, utilities and the South Boston Maritime Park on D Street. Liberty Wharf, which opened in 2011, is a multi-use development containing five restaurants, boutique office space, a public harbor walk and water slips for transient vessels. Waterside Place Phase I, a residential development with 236 apartment units, opened in January 2014; construction of Phase II of the project, the Gables Seaport, commenced in 2018. The Gables Seaport development program includes 307 apartment units and ancillary parking and retail uses. Parcel K, a mixed use development containing an apartment building, hotel and underground parking structure, commenced construction in the second quarter of 2018. Pembroke Real Estate LP, the real estate arm of Fidelity Investments, recently announced plans to undertake a substantial adaptive reuse and rehabilitation of the World Trade Center/Commonwealth Pier, with construction expected to commence in early 2020 and be completed in 2024. This project, which will be financed with third party funding, is <u>not</u> part of the FY19-FY23 Capital Program. The project will enhance its current uses by replacing the existing exhibition hall with new public realm spaces and improvements and expanded retail space, as well as creating new flexible and innovative office space and first-class event spaces.

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

The Authority recently completed the South Boston Waterfront Transportation Center, which provides approximately 1,550 parking spaces for the Waterfront; this facility opened in May 2018. See "CAPITAL PROGRAM – Authority Funded Capital Projects – Real Estate Improvements" herein. In addition, the Authority and its ground lessee continue to move forward with the development of an approximately 1,050-room luxury hotel located on the Authority's Parcel D-2, which is located on Summer Street opposite the BCEC. Construction is underway with completion and hotel opening expected in February 2021.

In November 2018, Massport designated a developer for a key parcel in the district known as Parcel A-2. Boston Global Investors (*"BGI"*) was selected to develop a 600,000 square foot office tower on the 1.1 acre parcel adjacent to Congress Street, the World Trade Center Silver Line transit station, and the ramps to and from Interstate 90. In addition, BGI's project will include $25 million in investment and 100,000 square feet set aside for public realm initiatives and activation elements, a first for a development in the Seaport.

In connection with both the Parcel D-2 and Parcel A-2 projects described above, the Authority included diversity and inclusion as one of four equally weighted scoring criteria, when evaluating developer proposals. Both developers have committed to an extensive diversity and inclusion program for the development, including investor/equity participation, real estate expertise and construction contractors and vendors.

See "CAPITAL PROGRAM – Third Party Funded Capital Projects."

Fargo Street Terminal South. In March 2010, the Authority and Boston Harbor Industrial Development LLC ("*BHID*") entered into a 75-year ground lease for approximately 38 acres of land that abuts the Reserved Channel.

The property contains approximately 761,000 square feet of building area in seven existing buildings that house a variety of industrial/warehousing tenants and other similar uses. A predecessor entity to BHID had been leasing this site since 1965 under a prior ground lease with the Authority. In addition to substantially increased ground rent to the Authority, the lease required BHID to make substantial investments in roadway and seawall infrastructure improvements, which were completed in 2014. BHID has also made additional investments and improvements to its 645 Summer Street building and has proposed re-developing a portion of the site.

Boston Fish Pier and South Boston Seafood Cluster. The Boston Fish Pier provides seafood processing space on the first and second floors of the East and West Buildings and 60,000 square feet of third floor office space, and also is home to the No Name restaurant, Trio Café and the Exchange Conference Center. The roughly 100,000 square feet of seafood processing space is now fully leased, an increase from half-leased in 2013. Massport Maritime Department administrative and public safety functions, as well as several maritime industrial and other tenants occupy roughly half of the available office space. The Fish Pier is the home to Boston's commercial fishing fleet, and all 22 berths are leased with a waiting list. In 1996, the Authority designated a minimum of eight acres at the Massport Marine Terminal ("*MMT*") in South Boston for state-of-the-art seafood-processing facilities. The MMT site is home to two facilities, one of which is the Legal Sea Foods Quality Control Center (opened in 2004), which also serves as the corporate headquarters. The other facility is the Harbor Seafood Center, a 68,000 square foot multi-tenant seafood processing facility that opened in 2001 as the first phase of the new district. The Harbor Seafood Center lease was sold by APCA/Paradigm to Chestnut Realty in February 2017.

Massport Maritime Terminal. Massport has a long-term lease with the City of Boston's Economic Development and Industrial Corporation for the MMT, a 40-acre property at the tip of the South Boston Waterfront and incorporated in the city's Raymond L. Flynn Marine Park. Consistent with Massport's mission, this property is dedicated to maritime industrial use with a particular emphasis on preserving and promoting the vibrant seafood processing industry in Boston. The Authority issued a Request for Proposals in February 2016 to develop portions of the MMT for seafood, warehouse, bulk and other maritime industrial uses, awarding parcels within this district to Cape Cod Shellfish & Seafood Co. and Pilot Seafood Properties to construct modern seafood-related facilities. Cape Cod Shellfish & Seafood Co. was designated as the Parcel 4 developer; the Development Agreement was executed in December 2018 and the project is currently in the design and permitting stage. Pilot Seafood Properties ("*Pilot Seafood*") was designated as the developer of Parcel 6; the Development Agreement was executed in June 2017 and a Ground Sublease for Parcel 6A was executed in November 2018. Boston Sword & Tuna (Pilot Seafood's sub-tenant), a fifth generation Boston seafood business, broke ground on Parcel 6A for a new 50,000 square foot facility in December 2018 and is expected to complete construction in December 2019. Developments on Parcels 6B and 6C are progressing. A Request for Proposals for Parcel 5 was issued in June 2018, and Pilot Seafood received Board approval as the developer in November 2018. Pilot Seafood is in the planning phases for a new seafood processing facility on Parcel 5A, possibly with Stavis Seafoods. On Parcel 5B, Pilot Seafood is working to identify potential maritime industrial uses, including freight and/or seafood processing.

Other Maritime Facilities. The Authority controls several facilities that are used for warehousing, or for importing, processing or distributing bulk and other waterborne commodities such as cement and seafood. These facilities include 88 Black Falcon (an intermodal cargo warehouse and office facility), MMT (40 acres) and the Fargo St. Terminal North (13 acres). As mentioned above, the MMT is the location of several existing and planned seafood facilities. In addition, the Authority uses portions of the site to meet cruise and other operational needs.

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

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

East Boston Waterfront Properties. The Authority has entered into agreements with affiliates of Roseland Residential Trust, a Mack-Cali company (*"Roseland"*) to redevelop East Boston Pier One and two adjacent shore parcels into a multi-phase residential development that will include parking, retail, amenity space and community space. The first building opened in December 2014, and the next two buildings were opened and leased by November 2018. Roseland and the Authority are studying the feasibility of the third and final phase of residential development on the Pier itself, in light of significant structural costs associated with development on the Pier.

The Authority also designed and constructed a park on Pier 4 known as "East Boston Piers Park." Phase I of the park opened to the public in 1995. The Authority is now considering development of Phase II of the Park on adjacent shore parcels.

In January 2012, the Authority entered into a long-term ground lease with Coastal Marine Management to operate, maintain and improve the Boston Harbor Shipyard and Marina located in East Boston. In May 2018, Coastal Marine Management assigned this ground lease to Boston Harbor Shipyard & Marina LLC. More than $9.0 million in qualified capital expenditures have been spent on the property since 2012. This number does not include the $5.0 million investment spent in 2017-2018 by the Institute of Contemporary Art to renovate Building 23, which now houses the "Watershed," a seasonal exhibition space in East Boston that also features a gallery dedicated to the history of the shipyard and the community.

STRATEGIC PLAN

Massport 2022

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

Pursuant to the Massport 2022 strategic initiative, during fiscal years 2013 and 2014, the Authority engaged in a 24-month effort to prepare a unified Strategic Plan (the "*Plan*") for all of its facilities, which Plan was adopted by Members of the Authority in November 2014. The goal of the Plan was to support and allow Logan Airport to serve the needs of its rapidly growing passenger base and to enable the Conley Terminal to prepare for the larger ships and consolidated shipping lines that are now serving Conley Terminal after the opening of the expanded locks in the Panama Canal. The Plan also examined how best to position the Authority's real estate holdings in East Boston and South Boston that are not required for aviation or maritime uses. The Plan identified the following key opportunities aimed at achieving these goals, among others:

<u>Investing in the Authority's Airports:</u>

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

Revitalizing the Maritime Mission

- Making Conley Terminal "big ship ready" through (i) the Deep Draft Project, and (ii) investment in new berths, container gantry cranes, backlands and landside transport access, including a new dedicated freight corridor and construction of new Berth 10;
- Improving Flynn Cruiseport Boston to accommodate the growth in cruise passenger activity, including (i) terminal improvements, (ii) securing control of Black Falcon Avenue and (iii) providing adequate cruise parking; and
- Optimizing maritime use of Fish Pier and assessing the seafood industry's future needs.

Developing and Protecting Massport's Real Estate Assets

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

The Plan provides a framework for prioritizing the Authority's strategies and investments moving forward; the specifics have been and continue to be adjusted as necessary to respond to the rapidly changing environment in which the Authority operates. Since the Plan was approved, the Authority's staff has been working and continues to work to develop specific business plans designed to address and implement the strategic initiatives. The Plan has helped shape each capital program since fiscal year 2015, including the FY19-FY23 Capital Program (defined below), and the more detailed business plans will shape subsequent capital plans.

Growth in Airport Passengers, Maritime Activity and Market Demand

As reflected in APPENDIX C – Boston Logan International Airport Market Analysis, the Airport is one of the leading U.S. airports in terms of airline and air passenger growth and continues to be a highly desirable market for air carriers. In fiscal year 2018, the Authority experienced another year of record-breaking growth in passengers at Logan Airport. Carriers, including Delta (which announced in June 2019 that it had made Boston its newest coastal hub) and Jet Blue (which considers Boston a key focus city), have announced plans for new nonstop service and/or increased frequency of service (See Chapter 3 of APPENDIX C – Boston Logan International Airport Market Analysis). At the Port, the Authority also continues to experience record breaking growth, with carriers wishing to call on the Port with larger container vessels, necessitating deepening of the harbor and modernization of the landside facilities. See "PORT PROPERTIES – Maritime Properties." Given (i) the need to accommodate the passenger growth and airline demand that is currently being experienced at Logan and (ii) the increased business in the Port of Boston and the need to keep Conley Terminal competitive to support the region's economy, the Authority has embarked upon a second phase of the Strategic Plan (the "*Phase 2 Plan*").

Strategic Plan – Phase 2

The Phase 2 Plan focuses the Authority's resources more specifically towards accommodating the increased passenger growth and airline demand at the Airport with the following goals in mind: (i) providing post security connectivity among all of Logan's terminals, (ii) ensuring roadways and curbsides can accommodate such growth, and (iii) expanding Terminal E. The Phase 2 Plan also includes continued strategic investments at Conley Terminal in order to modernize the landside and accommodate the larger vessels now calling on the port. The size of the FY19-FY23 Capital Program is a direct reflection of the need to accomplish these important strategic goals on an expedited basis, and it includes a number of projects specifically intended to address these key goals of the Phase 2 Plan.

Post Security Connectivity. The mergers of several of Logan's major carriers in the last ten years have in many cases required the Authority to redistribute gates and holdrooms among different terminals to accommodate different airline fleet mixes and flight schedules. The lack of post security connectivity among all of Logan's terminals has historically impeded this effort. By providing interconnectivity between all of Logan's terminals on a post security basis, the Authority will have more flexibility in managing its constrained gate complement and will be in a better position to quickly relocate airlines between gates when they merge, or expand or contract service. This will enable the Authority to better accommodate airlines that are expanding service because a greater supply of suitable gates will be available for their use, while also allowing the Authority to reclaim gates from contracting (or relocating) carriers for redistribution. The Authority also believes providing 100% post security connectivity will foster airline competition because it allows the Authority to better match the scarce supply of gates at Logan with the airlines' demand for gates.

In recent years, the Authority has successfully completed post security connections between Terminal C and Terminal E, as well as within all of Terminal B. The Terminal C Optimization and Terminal B to C Connector project, which is a component of the FY19-FY23 Capital Program and a key component of achieving the Phase 2 Plan goal of post security connectivity throughout the Airport, will provide for a post security connection between Terminals B and C. See "CAPITAL PROGRAM – Authority Funded Capital Projects – *Improvements to Accommodate Airline Consolidation and Domestic Travel Growth at Logan*." After completion of this project, the only terminal remaining to be connected is Terminal A, which is expected to be undertaken after fiscal year 2024.

<u>*Roadway and Curbside Improvements*</u>**.** An additional goal of the Phase 2 Plan is to ensure Logan Airport's roadways are capable of handling the increased passenger growth. To that end, the Authority is evaluating how to effectively address passengers' mobility and vehicle congestion on the Airport's roadways. The Terminal C Roadways project, another component of the FY19-FY23 Capital Program, is designed to meet the Authority's objectives to improve Logan Airport traffic and improve egress from Terminal B and access to Terminal C. In addition, the FY19-FY23 Capital Program includes a project to evaluate the feasibility of a "people mover" to improve vehicle accessibility and circulation at Logan Airport. See "CAPITAL PROGRAM – Authority Funded Capital Projects – *Improvements to Roadways and Ground Transportation at Logan*."

<u>*Terminal E Expansion*</u>. The Phase 2 Plan also specifically focuses on the needed expansion of Terminal E to accommodate the rapid growth in international passengers. To accommodate such growth, the Authority plans to expand Terminal E by adding seven new gates and related support space in two phases. See "CAPITAL PROGRAM – Authority Funded Capital Projects – *Improvements to Facilitate the Growth of International Traffic at Logan*."

<u>*Berth 10 Construction*</u>. In addition to the Airport projects described above, the Phase 2 Plan also includes continued modernization at Conley Terminal to enable it to accommodate the newly consolidated shipping lines and the arrival at the Port of larger neo-panamax vessels. In the summer of 2018, construction began on the new 50-foot deep Berth 10, and in the fall of 2018, three new ship-to-shore cranes were ordered. The cranes are critical to efficiently and effectively servicing the 8,500 – 9,000 TEU ships calling on Conley Terminal today, and the 12,000-14,000 TEU ships that are expected to call on Conley Terminal in the future. The Berth 10 and cranes project, in connection with other enabling projects such as the Deep Draft Project (see "PORT PROPERTIES – Maritime Properties"), will enable Massport to accommodate neo-panamax container ships at Conley Terminal, to prepare for the larger ships and to keep Conley Terminal competitive to support the region's economy.

CAPITAL PROGRAM

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

Many of the commitments within the Authority's capital plan have already been authorized by the Authority and extend over several years. The modular design of the capital plan, however, allows the Authority to continually monitor and make adjustments to the overall program, even after work on individual projects has commenced. If significant changes were to occur in available amounts from expected funding sources, or if the costs of certain projects were to increase significantly, the Authority would adjust the timing or reduce the scope of individual proposed projects or the overall program, or both, to accommodate such changed circumstances.

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

On February 14, 2019, the Authority approved the Fiscal Year 2019-2023 Capital Program (the "*FY19-FY23 Capital Program*"). The FY19-FY23 Capital Program represents a comprehensive and coordinated capital improvement and financial master plan for all Authority facilities. The program was developed to be consistent with the Plan and the Authority's strategic goals of meeting growing demand at Logan, protecting the future of the Maritime container and cruise lines of business and defining the role of the commercial real estate properties, while maintaining strong financial management and competitive rate structures, being a good neighbor, planning for increased resiliency, prioritizing security and improving customer service levels in the face of rising demand. Specifically, the FY19-FY23 Capital Program funds major initiatives that support the Authority's strategic goals such as:

Supporting Logan's Ability to Handle Increased Passengers:

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

Safety and Security:

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

Fostering the Development of the Working Port, Flynn Cruiseport and Developing the Authority's Real Estate Assets:

- Boston Harbor Deep Draft dredging project;
- Construction of Berth 10 and procurement of three new ship-to-shore cranes at Conley Terminal;
- Design and permitting for Flynn Cruiseport enhancements and renovations;
- Construction of a dedicated freight corridor at Conley Terminal (completed); and
- Constructing the South Boston Waterfront Transportation Center (completed).

In addition, the FY19-FY23 Capital Program includes the installation of a Category III ILS and taxiway improvements at Worcester Airport, which were substantially completed in March 2018, construction of the airfield rescue and firefighting ("*ARFF*") facility and customs and border protection ("*CBP*") facility at Hanscom Field, and the maintenance and renewal of its existing facilities, all as more fully described below.

The FY19-FY23 Capital Program includes forecasted total expenditures of approximately $2.6 billion by the Authority and approximately $1.8 billion by third-party or non-recourse funding sources for ongoing projects and for projects to be commenced during the five-year program period, for a total of approximately $4.4 billion. The size of the FY19-FY23 Capital Program is a response to the growth in passengers at Logan Airport, as well as the accelerated growth in container volume at the Port, which has prompted the need to undertake projects sooner than anticipated in the Plan to facilitate the increase in demand. The financial plan to support the capital program includes, among other things, (i) additional bond issues (to fund $374.0 million of project costs) in fiscal years 2021 and 2022, (ii) planned parking rate increases of $3.00 per day in fiscal years 2020 and 2022 for all Logan Airport parking facilities, (iii) funding to be received from the Commonwealth pursuant to the Conley Terminal MOU, and (iv) certain dedicated long-term ground lease and parking revenues from the Authority's commercial developments in South Boston.

Set forth in the following table is a summary of the Authority-funded portion of the FY19-FY23 Capital Program, including estimated funding sources and a summary of uses, showing capital projects by funding category. **The funding sources and uses set forth below reflect expectations as of the date the FY19-FY23 Capital Program was adopted and are subject to change over the course of the current five-year planning period.** The Authority-funded portion of the FY19-FY23 Capital Program is funded from a variety of sources, including bond proceeds, grants, passenger facility charges ("*PFCs*"), Customer Facility Charges ("*CFCs*") and pay-as-you-go capital. The Authority's financing plan assumes the issuance of the 2019 Bonds to fund $467.4 million of projects costs (of which $436.3 million is expected to be expended during fiscal years 2019 through 2023, and $31.1 million is planned to be used to reimburse expenditures made prior to fiscal year 2019). These projects include Phase 1 of Terminal E modernization, improvements to the roadways between Terminal B and Terminal C, the optimization of Terminal B, Terminal C optimization and construction of a secure connection between Terminal B and Terminal C, improvements to Terminal C curbside space and canopy, and the construction of a new Berth 10 and the acquisition of cranes at Conley Terminal. The table below does not reflect projects that have been or may be funded through other third-party or non-recourse funding sources. For information about the portion of the FY19-FY23 Capital Program (consisting of approximately $1.8 billion in projects) anticipated to be funded through third-party or non-recourse funding sources, see "Third Party Funded Capital Projects" below.

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FY19-FY23 CAPITAL PROGRAM
SUMMARY OF ESTIMATED FUNDING SOURCES AND CAPITAL PROJECTS
(Authority Funded Portion) [1]
($ in thousands)

Funding Sources	
Maintenance Reserve Fund	$524,046
Improvement and Extension Fund	656,355
PFC - Pay Go	31,642
FAA, TSA, U.S. DOT FASTLANE grant, Other Grants & Commonwealth Funds [2]	179,441
Prior Bond proceeds [3]	198,683
Future Bonds Payable from Revenues [3]	783,185
Future Bonds Payable from PFC [3]	196,412
Other [4]	3,736
Total Sources (Authority Funded)	**$2,573,500**
Project Costs Funded with Revenue Bonds	
Terminal E Modernization - Phase 1 [5,6,8]	$518,404
Terminal C Optimization and B to C Connector [5,6,8]	144,608
Terminal B Optimization [5,6,8]	78,648
Terminal C Canopy and Upper Deck [5,8]	64,699
2,000 Parking Spaces [8]	107,652
Terminal B to C Roadway Improvements [5,8]	157,176
New Berth 10 and Cranes at Conley Terminal (Massport Portion) [5,8]	88,105
Other Projects [7]	18,988
	$1,178,280
Project Costs Funded with PFCs and Grants	
Runway 9-27 Rehab	$19,000
Taxiway C3 Pavement Rehab and New Bypass Taxiway	7,247
Taxiway D, D1, MS Rehab	5,600
Rehabilitate North Cargo Apron	6,400
Rehabilitate Taxiways East Alpha & Bravo [8]	2,531
Conley Terminal Grant and Commonwealth Funded Projects [8]	
U.S. DOT FASTLANE Grant Projects	32,728
New Berth 10 and Cranes at Conley Terminal (Commonwealth Portion)	107,500
Other Projects	30,077
	$211,083
Other Project Costs Funded with Massport Internally Generated Funds	
South Boston Waterfront Transportation Center	$20,054
HVAC Equipment Replacement Program [8]	25,165
Terminal C Optimization and B to C Connector [8]	47,977
Terminal B Optimization [8]	9,013
Terminal C Roadways [8]	31,628
Central Heating Plant Upgrade [8]	45,829
2,000 Parking Spaces [8]	12,000
Conley Terminal Grant and Commonwealth Funded Projects [8]	
U.S. DOT FASTLANE Grant Projects	49,549
New Berth 10 and Cranes at Conley Terminal (Massport Portion)	14,018
HOV Initiatives	50,000
Equipment Storage Maintenance Facility	49,804
Elevator & Escalator Upgrades – Phase 2	26,646
People Mover Programming & Concept Design	24,998
Other Projects [9]	773,720
	$1,180,401
Other Project Costs [6]	3,736
Total Capital Projects (Authority Funded)	**$2,573,500**

1 Reflects only that portion of the FY19-FY23 Capital Program expected to be financed by the Authority. Does not include approximately $1.8 billion of projects expected to be funded through third-party or non-recourse funding sources. See "CAPITAL PROGRAM – Third Party Funded Capital Projects" herein for more information on third party projects included in the FY19-FY23 Capital Program.
2 Includes Commonwealth funds expected to be received by the Authority for Berth 10 construction and cranes acquisition ($107.5 million), and the Authority's award of a $42.0 million FASTLANE grant, of which $32.7 million is anticipated to be received in FY19-FY23.
3 Proceeds amount shown here does not include bond reserves, costs of issuance or capitalized interest beyond the fiscal years 2019 through 2023 time period.
4 Includes project costs funded with Terminal A Maintenance Reserve Fund ($0.2 million) and Customer Facility Charges ($3.5 million).
5 Expected to be funded in whole or in part with proceeds of the 2019 Bonds. The 2019 Bonds are also expected to fund $31.1 million of costs incurred prior to fiscal year 2019.
6 A portion of this project expected to be financed with proceeds of Bonds payable from PFCs ($172.6 million of Terminal E Modernization Phase 1, $42.0 million of Terminal B Optimization, and $40.3 million of Terminal C Optimization and Terminal B to C Connector).
7 Includes a variety of projects financed with proceeds of prior Bonds.
8 Projects with multiple financing sources.
9 This category includes over 306 airport, maritime and real estate projects with individual cost estimates ranging from under $1.0 million to $36.0 million.

Authority Funded Capital Projects

Logan Airport Improvements. The FY19-FY23 Capital Program includes funding for all or a portion of the following improvements at Logan Airport:[2]

Improvements to Accommodate Airline Consolidation and Domestic Travel Growth at Logan. To enhance the operational efficiency and flexibility of Terminal B Pier B, the Authority is redesigning the space inside Terminal B at a total expected cost of $156.0 million, expected to be funded with a combination of (i) Bond proceeds of $102.5 million (previously financed with $77.5 million of proceeds of the Series 2017-A Bonds and $25.0 million of proceeds of the Series 2016-B Bonds), (ii) PFCs or Bonds payable from PFCs (see "Funding Sources – 2019 Bond Proceeds" below) ($42.0 million), (iii) Authority funds ($9.9 million) and (iv) Federal grants ($1.6 million). This project is an important component of the Airport's long term planning goal to have all terminal gates connected post security. The primary focus of the project will be to expand Terminal B's existing footprint by approximately 9,000 square feet to achieve consolidated security checkpoints that include six automated screening lanes to increase throughput and enhance security, consolidate ticketing into one central location to ensure that sufficient ticketing counters are available in one given area for an airline to operate, make apron improvements to accommodate a wider range of aircraft at most gates, add a connecting corridor from Gates 1 – 3 to the main Terminal B so all Terminal B Pier B gates will be connected post security, and right-size the holdrooms, adding approximately 12,000 square feet to holdroom space, to accommodate the increased number of actual and projected airport passengers. This project is expected to enable the consolidation of American's operations in Terminal B, thereby freeing up five gates in Terminal B, Pier A that will be relinquished by American for expanded operations by other carriers or to accommodate new carriers at the Airport. As a result of this optimization project, the Authority expects that in fiscal year 2020, Southwest will move into the vacated Terminal B, Pier A gates and that Delta will take on Southwest's five gates in Terminal A to expand its operations.

The FY19-FY23 Capital Program also includes two projects designed to improve post-security passenger connectivity at the airport. The first project, which was completed in March 2018, was the construction of a secure-side link to connect Terminal B gates 37-38 to the consolidated checkpoint ($25.0 million), which allowed for the closure of the separate checkpoint that served only those two gates. The second project designed to improve post-security passenger connectivity is the Terminal C Optimization and Terminal B to C Connector ($193.0 million), which involves the build-out of new space in Terminal C, Pier B and the construction of an additional gate at Terminal C, Pier D, and provides for efficient passenger movement between terminals and new and repurposed pre- and post-security passenger amenities. This Project is expected to be funded with a combination of (i) Bond proceeds of $104.7 million, (ii) PFCs or Bonds payable from PFCs (see "Funding Sources – Future Bond Proceeds" below) ($40.3 million), and (iii) Authority funds of $48.0 million. In accordance with the Strategic Plan, these two projects will complete the post security passenger connectivity of all gates in Terminal B to Terminal C.

Improvements to Facilitate the Growth of International Traffic at Logan. The Authority has undertaken a number of projects to support the increase in international traffic. The first of these projects, which are complete, consisted of renovations and enhancements to the airfield ($10.0 million) and Terminal E ($167.0 million) to accommodate Group VI aircraft (A380 and 747-800), including the addition of two-level aircraft boarding jet bridges. The renovations and enhancements to Terminal E were funded primarily with proceeds of the Series 2016-B Bonds, and the project was completed in October 2017.

The second, and larger, project is a major Terminal E modernization project that is expected to add seven gates to Terminal E in two phases. The Terminal E modernization project is also expected to include the addition of ticket counters, increased customs and border protection facilities, additional baggage carrousels and other passenger amenities. The first phase, Terminal E Modernization – Phase 1, is included in the FY19-FY23 Capital Program and would add four new gates. These additional gates are expected to improve apron operating efficiencies and decrease Terminal E delays. The second phase, Terminal E Modernization – Phase 2, which would add the remaining three gates, is expected to be incorporated in future capital programs. The FY19-FY23 Capital Program includes $530.0 million for Phase 1 of the Terminal E modernization project. Phase 1 of the project is expected to be funded with a

[2] Total project costs reflected in this section may differ slightly from the summary table on the prior page to the extent such projects have multiple funding sources and/or involve spending that has occurred either prior to fiscal year 2019 or that will occur after fiscal year 2023 (and thus falls outside the current capital planning period).

combination of (i) Bond proceeds ($357.3 million), (ii) PFCs or Bonds payable from PFCs (see "Funding Sources – Future Bond Proceeds" below) ($172.6 million) and (iii) Authority funds ($0.1 million). The total cost of the Terminal E modernization project is currently expected to be $680.0 million, with the remaining $150.0 million to add the remaining three gates (Terminal E Modernization – Phase 2) expected to be incorporated in future capital programs.

Improvements to Roadways and Ground Transportation at Logan. The FY19-FY23 Capital Program includes two major projects designed to address roadway congestion that has resulted from increased passenger traffic—the Terminal B to C Roadway Improvements project and the Terminal C Canopy and Upper Deck Project. The Authority will continue its investment in ground transportation at Logan by improving the Terminal B to C Roadways at a total expected cost of $190.0 million, expected to be funded with a combination of (i) Bond proceeds of $158.0 million and (ii) Authority funds of $32.0 million. The goal of the Terminal B to C Roadway Improvements project is to replace the aging section of viaduct, improve traffic flow and alleviate congestion at Terminal C. Currently, during peak operation hours, there are frequent challenges with respect to the traffic flow between Terminals B and C, which negatively impacts the ability of passengers to reach the Terminal C curbside. The project includes the construction of a new section of departures roadway viaduct, along with new surface roadways at the arrivals level. The new roadway system with improved alignment is intended to meet the Authority's objectives of eliminating costly and disruptive roadway repair contracts and improving access to Terminal C to respond to the Airport's projected flight growth. In addition, the Terminal C Canopy and Upper Deck project, with a total expected cost of $65.0 million that is expected to be funded with a combination of (i) Bond proceeds ($64.8 million) and (ii) Authority funds ($0.2 million), will replace the existing departures level canopy and provide more curbside space for passengers.

In addition, as the number of passengers using Logan Airport continues to grow and demand continues to increase, the Authority is evaluating how to effectively address passengers' mobility and vehicle congestion on the Airport's roadways. To that end, the FY19-FY23 Capital Program includes $25.0 million to study the feasibility of an automated "people mover" to improve the accessibility of Logan Airport. The "people mover" is currently envisioned to be a monorail or tram system that would be configured to serve landside Airport passengers from all terminals primarily to/from four transportation facilities: (1) the MBTA's Blue Line station at the Airport, (2) the economy parking garage, (3) the RCC and (4) a to-be created transportation center to be located in the Southwest Service Area. Pending the outcome of the feasibility study, if the Authority were to proceed with this project it is currently expected that the "people mover" would be fully operational by 2027 at a total estimated cost of $1.3 billion, with such amount being incorporated in future capital programs.

Finally, the Authority is planning for the replacement of a portion of the Silver Line Buses in fiscal year 2022 ($12.5 million), which is expected to be funded with Authority funds, and a portion of the mid-life rebuild of on-airport shuttle buses ($4.7 million), which is expected to be funded with a combination of (i) CFCs ($2.1 million) and (ii) Authority funds ($2.6 million). The remaining costs for the Silver Line Buses and mid-life rebuild of on-airport shuttle buses total $12.5 million and $20.3 million, respectively, and are expected to be incorporated into future capital programs.

Improvements to Facilitate Airport Parking. Logan reaches its parking capacity on numerous occasions throughout the calendar year. In an effort to alleviate this parking demand, the Authority has included a major parking project in the FY19-FY23 Capital Program. With an ultimate goal of constructing up to 5,000 new parking spaces at the Airport (at a total expected cost of $250.0 million), the FY19-FY23 Capital Program includes $120.0 million to construct the first 2,000 parking spaces. This project is expected to be funded with a combination of (i) Bond proceeds ($108.0 million) and (ii) Authority funds ($12.0 million). The construction of the remaining 3,000 parking spaces is expected to be incorporated in future capital programs. See "AIRPORT PROPERTIES – Airport Facilities – Parking Facilities."

Other Airport Projects. The remainder of the FY19-FY23 Capital Program relating to the Airport includes a variety of airside and landside projects including the following projects and their estimated costs for fiscal years 2019 through 2023: (i) HVAC equipment replacement program ($30.0 million) and (ii) central heating plant upgrade ($49.5 million). Approximately $52.0 million of Logan airfield projects are expected to be funded with grants and PFCs including but not limited to rehabilitation of the north cargo apron ($16.4 million), runway 9-27 rehabilitation ($19.0 million) and various taxiway rehabilitations ($15.6 million).

Worcester Airport and Hanscom Field Improvements. As part of the Authority's commitment to developing air service for the citizens of central Massachusetts, from fiscal year 2019 through fiscal year 2023, the Authority expects to spend $50.1 million on improvements at Worcester Regional Airport, including $4.0 million to complete payments for the installation of a Category III ILS and related taxiway improvements (total cost $32.0 million). The Category III ILS dramatically improves reliability for commercial flight operations in low visibility conditions. In addition, the FY19-FY23 Capital Program includes Authority expenditures of $10.9 million to complete the ARFF station and CBP facility at Hanscom Field (total cost of $12.0 million, of which $1.1 million was expended prior to fiscal year 2019). Subsequent to project completion, the Authority expects to apply $4.8 million in FAA grant reimbursements towards the costs of this project, thereby reducing the total cost of this project funded by the Authority to $7.2 million.

Maritime Improvements. The FY19-FY23 Capital Program includes funding for all or a portion of the following improvements at the Port Properties:

Conley Terminal Projects. As part of its strategic planning efforts, the Authority continues to improve Conley Terminal to accommodate the newly consolidated shipping lines and the arrival at the Port of larger post-panamax vessels. The FY19-FY23 Capital Program includes $32.0 million for Boston Harbor dredging, the Authority's share of the Deep Draft Project, $209.6 million relating to the construction of Berth 10 and the purchase and installation of three new ship-to-shore cranes, and $82.3 million for the Conley Terminal infrastructure improvements, equipment upgrades and Berth 11 dredging. The remaining costs of the Conley Terminal modernization project are expected to be included in future capital programs. See "PORT PROPERTIES – Maritime Properties – Conley Terminal" for a further discussion of the total cost and expected funding sources for the various improvements at Conley Terminal.

Flynn Cruiseport Boston Improvements. The FY19-FY23 Capital Program includes $36.1 million for Flynn Cruiseport Boston, of which $10.0 million relates to the $100.0 million in funding needed to upgrade and expand Flynn Cruiseport Boston in order to better position the facility to capture future growth opportunities. The $10.0 million will be used for design and permitting of a new homeport terminal and upgrade of the existing terminal to service the next generation of cruise ships. See "PORT PROPERTIES – Flynn Cruiseport Boston." The remaining $26.1 million included in the FY19-FY23 Capital Program is expected to be used for structural seawall reconstruction, window replacements, additional customer seating, a ground transportation area, procurement of a new cruise ship boarding bridge, berth protection equipment, electrical upgrades, and exterior enhancements.

Real Estate Improvements. In May 2018, the Authority completed the construction of the 1,550-space South Boston Waterfront Transportation Center on a parcel located in South Boston near the BCEC. This facility provides parking for other Authority developments in South Boston, including the Omni Hotel (see "Third Party Funded Capital Projects – Omni Summer Street Hotel" below), as well as parking for the general public. The multi-level, multi-modal transportation center is built over, and supported by, the I-90 tunnel structure built as part of the Central Artery & Tunnel (CA/T) Project. The $90.0 million facility was funded with Authority funds.

The FY19-FY23 Capital Program also includes the construction of a Department of the Army ("*DOA*") equipment maintenance facility and performing certain site work at the DOA Fort Devens site ($13.4 million total project costs). In exchange for this work, the DOA has agreed to transfer to the Authority a 4.3 acre parcel on E Street, which parcel is strategically located adjacent to the Authority's Fargo Street terminal. This land will support the future development of a new United States Postal Service general mail facility, to be relocated from South Station.

Third Party Funded Capital Projects

Other Third Party Development Ventures. As described above, the Authority expects that approximately $1.8 billion of the total FY19-FY23 Capital Program will be financed by third party funds (*i.e.* funds that are not on the Authority's balance sheet). Projects include a mixed-use development on Parcel K ($326.0 million) currently under construction and expected to open in 2020, the Omni Summer Street Hotel ($558.0 million) (as further described below), the Gables Seaport apartment development ($130.0 million) currently under construction and expected to open in 2020, Roseland's recently completed third apartment building in East Boston ($113.0 million), and Terminal Improvements by JetBlue at Terminal C ($100.0 million).

Omni Summer Street Hotel. Development continues on an approximately 1,050-room luxury hotel located on Parcel D-2, which parcel is owned by the Authority and is located on Summer Street opposite the BCEC. The Authority has executed a long term ground lease with the selected developer, a joint venture of New Boston Hospitality (The Davis Companies) and Omni Hotels and Resorts. This project is being developed using approximately $558.0 million of private investment. Construction commenced in 2018, with project completion expected in 2021.

Funding Sources

The various projects listed in the FY19-FY23 Capital Program have been and will be financed: (i) through the issuance of Bonds, including Bonds payable from PFCs, and commercial paper, (ii) from the application of PFCs, federal grants, CFCs and private capital, (iii) from Commonwealth funds, and (iv) from cash flow from the Authority's operations. The Authority's commercial paper program provides interim funding for certain projects. See "MANAGEMENT'S DISCUSSION OF FORECAST ASSUMPTIONS – Debt Service and Coverage." As of March 31, 2019, the Authority had the following approximate amounts available for projects included in the FY19-FY23 Capital Program: $668.5 million of cash from operations, $39.0 million of Bond and commercial paper proceeds, $64.4 million of pay-as-you-go PFCs, $67.6 million of CFCs and $42.3 million of Commonwealth funds for harbor dredging.

2019 Bond Proceeds. The proceeds of the 2019 Bonds are expected to be used by the Authority to finance $467.4 million of project expenditures as shown in the table below ($ in thousands):

	Total Expected Project Expenditures from Bond Proceeds	Portion Expected to be Payable from PFCs
2019-B BONDS (Non-AMT)		
Terminal B to C Roadway Improvements	$90,442	--
Terminal C Canopy and Upper Deck	64,805	--
Total 2019-B Bond Proceeds	**$155,247**	**$0**
2019-C BONDS (AMT)		
Terminal E Modernization	72,150	--
Terminal B Optimization	42,000	$42,000
Terminal C Optimization and Terminal C to Terminal B Connector	104,693	--
New Berth 10 and Cranes at Conley Terminal	93,292	--
Total 2019-C Bond Proceeds	**$312,135**	**$42,000**

Of the amounts set forth above, the Authority expects that $42.0 million of project expenditures allocable to Terminal B Optimization will be payable from PFCs, as permitted by certain amendments to the 1978 Trust Agreement that are expected to be effective as of the date of issuance of the 2019 Bonds. The Authority has received FAA approval for the use of PFCs for such purpose. See "SECURITY FOR THE 2019 BONDS – Use of Available Funds to Pay Debt Service" in the Official Statement. The amounts set forth in the foregoing table may be reallocated by the Authority in accordance with the 1978 Trust Agreement and the Bond Resolution.

Future Bond Proceeds. The FY19-FY23 Capital Program is based on the assumption that the Authority will issue two series of Bonds in fiscal years 2021 through 2022 to finance $587.0 million of project expenditures as set forth in the table below. Of this amount, the Authority expects that $212.9 million of project expenditures will be payable from PFCs, as permitted by certain amendments to the 1978 Trust Agreement that are expected to be effective as of the date of issuance of the 2019 Bonds. See "SECURITY FOR THE 2019 BONDS – Use of Available Funds to Pay Debt Service" in the Official Statement. It is expected that all of the proceeds of the 2020 Bonds and the 2021 Bonds will be spent by the end of fiscal year 2023.

	Total Expected Project Expenditures from Bond Proceeds	Portion Expected to be Payable from PFCs
Fiscal Year 2021 ("*2020 Bonds*")	$448.2 million	$169.6 million
Fiscal Year 2022 ("*2021 Bonds*")	138.8 million	43.3 million
TOTAL:	$587.0 million	$212.9 million

Proceeds from the portion of the 2020 Bonds and 2021 Bonds payable from PFCs are expected to be used to finance a portion of (i) Phase 1 of the Terminal E modernization project ($172.6 million) and (ii) a portion of the Terminal C Optimization and Terminal B to C Connector project ($40.3 million). The use of PFCs to pay debt service on the portion of the 2020 Bonds and 2021 Bonds allocable to these projects is subject to the receipt of FAA approval for PFC funding for these projects. If these projects are not approved for PFC funding, or if the approved amount is less than the Authority's PFC funding request, the Authority would be required to pay such debt service from Net Revenues.

Passenger Facility Charges. Beginning in 1993, the Authority has received multiple FAA approvals to impose and use PFCs, which have been collected at the $4.50 level since October 1, 2005. As of December 31, 2018, the Authority's PFC impose and use authority was a total of $1.81 billion. All PFCs collected by the Authority are presently deposited with The Bank of New York Mellon, as custodian (the "*PFC Custodian*"), pursuant to a PFC Depositary Agreement dated July 3, 2017 (the "*PFC Depositary Agreement*"), between the Authority and the PFC Custodian. In accordance with the 1978 Trust Agreement, the proceeds of PFCs have been excluded from the Revenues securing the Bonds. In the event that PFC revenues and other funding sources are inadequate to meet anticipated project costs, the Authority would look for other funding sources or defer or cancel projects.

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

Federal Grants. The Authority receives grants annually from the FAA pursuant to the Airport Improvement Program ("*AIP*"). These grants generally fall into two categories: (i) entitlement grants, which are awarded based upon the number of passengers enplaned, and (ii) discretionary grants, which are awarded at the discretion of the FAA based upon specified criteria, including a cost-benefit analysis. Similar to many federal grant-in-aid programs, AIP grants are reimbursement grants. Accordingly, the Authority must expend its own cash to fund an authorized project and then submit invoices to the FAA for reimbursement of such costs pursuant to the terms of the grant. Thus, while grants may be awarded in one fiscal year, grant funds may be received over a period of several subsequent fiscal years. For a description of the AIP program, see "AVIATION INDUSTRY CONSIDERATIONS – Considerations Regarding Other Sources of Revenue – Federal Grants-in-Aid." In addition to the FAA AIP grants, the Authority also receives grants from the U.S. Department of Homeland Security and the U.S. EPA from time to time.

The Authority will continue its practice of fully utilizing the AIP entitlement grants that are awarded to it to maintain and improve Logan Airport, Hanscom Field and Worcester Regional Airport, and of aggressively seeking FAA discretionary grants for AIP eligible projects. Based on communications with the FAA, the Authority currently expects $5.2 million in annual AIP entitlement grants for Logan, as well as $1.0 million in annual AIP entitlement grants for Hanscom Field and $1.0 million for Worcester Regional Airport.

In calendar year 2018, Hanscom Field was awarded a $4.8 million discretionary grant for the construction of the ARFF building and Worcester Regional Airport was awarded a $462,529 Voluntary Airport Low Emissions Program ("*VALE*") grant for a passenger boarding bridge, a $3.2 million discretionary grant for Runway 15/33 rehabilitation and a $2.0 million grant for the purchase and installation of two passenger boarding bridges, pre-conditioned air handling units and ground power units. Also in calendar year 2018, Logan Airport was awarded a $1.6 million VALE grant for ground service equipment charging stations related to the Terminal B Optimization project. In fiscal year 2018, the Authority collected AIP grants in the amounts of $6.6 million for Logan Airport, $3.0 million for Hanscom Field and $5.9 million for Worcester Regional Airport.

Major projects previously funded in part with TSA grant funds include $87.0 million to fund a portion of the cost of the infrastructure improvements at the Logan Airport terminals to accommodate the Airport's current hold baggage screening system (which has been replaced by the Checked Baggage Inspection System ("*CBIS*")), and $4.2 million for the installation of Closed Circuit Television Cameras. In fiscal years 2011 through 2015, the Authority entered into Other Transaction Agreements ("*OTAs*") with the TSA for a total of $120.9 million for the CBIS; through fiscal year 2018, the Authority collected the $120.9 million for the CBIS and the OTA was closed in August 2017.

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

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

Commonwealth Funds. The FY19-FY23 Capital Program assumes that the Commonwealth will provide $107.5 million, pursuant to the Conley Terminal MOU, to fund its portion of the costs of the Berth 10 and crane project over a three-year period from fiscal year 2020 to fiscal year 2022. See "PORT PROPERTIES – Maritime Properties – Conley Terminal." In order to accelerate commencement of the design and construction of Berth 10 and the procurement of three new cranes for Conley Terminal, the Authority issued a series of subordinated obligations in November 2018 to provide bridge financing pending receipt of the Commonwealth's portion of the total costs of such project. See "OTHER OBLIGATIONS – Subordinated Indebtedness" herein.

Other Funding Sources. The FY19-FY23 Capital Program has been developed to be achievable within the resources anticipated to be available to the Authority at relevant times, including the capacity of users of the facilities of the Authority to bear additional charges. Moreover, the Authority is expending considerable efforts to assure that program costs are predictable and controlled. Should there occur any significant increases in the costs of projects included in the FY19-FY23 Capital Program, whether due to cost overruns or other financial obligations not now contemplated, or should anticipated resources (e.g., federal grant receipts, PFC collections and/or Commonwealth grants) fail to materialize on schedule, resources available to the Authority may be inadequate to accomplish all objectives of the FY19-FY23 Capital Program. If so, the Authority would be required to utilize alternative funding sources such as the issuance of additional Bonds, or it may reduce or delay components of the FY19-FY23 Capital Program. In that event, the selection of projects to be reduced or delayed will depend on circumstances in existence at the time, including relative stages of development, relative economic importance to the activities of the Authority and degrees of transferability of project funding sources.

AUTHORITY REVENUES

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

Airport Properties Revenues

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

Consistent with federal law, aeronautical fees for use of Logan Airport, including landing fees and terminal building charges, are established on a "compensatory basis," that is, set at levels calculated to compensate the

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

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

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

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

The FAA has approved Authority applications to impose and use a $4.50 PFC as authorized by federal legislation through December 1, 2027. The revenues from PFCs are dedicated to certain FAA-authorized capital projects and are excluded from the Revenues pledged under the 1978 Trust Agreement that secure the Bonds. See "CAPITAL PROGRAM – Funding Sources – Passenger Facility Charges." The Authority also requires CFCs to be paid by rental car customers at Logan. The current CFC of $6.00 per day is collected by the rental car companies and remitted to the trustee for the CFC Revenue Bonds as security therefor. CFC revenues are excluded from Revenues pledged under the 1978 Trust Agreement securing the Bonds. See "OTHER OBLIGATIONS – CFC Revenue Bonds."

Terminal A Rental Revenues. Under the terms of a Trust Agreement dated as of August 1, 2001, as amended (the "*2001 Trust Agreement*"), by and between the Authority and The Bank of New York, as trustee (the "*Terminal A Bonds Trustee*"), pursuant to which the Authority's Special Facilities Revenue Bonds (Delta Air Lines, Inc. Project), Series 2001A, 2001B and 2001C (the "*Terminal A Bonds*") were issued, rental revenues the Authority received from Delta and other Terminal A airline tenants (the "*Terminal A Rental Revenues*") were split into two components based on a calculation known as the reletting allocation. These components include:

(i) revenues remitted to the Terminal A Bonds Trustee to pay debt service on the Terminal A Bonds (the "*Terminal A Remitted Revenues*"), which amounts are <u>not</u> recognized as Revenues under the 1978 Trust Agreement, and

(ii) Authority recognized revenues (the "*Terminal A Recognized Revenues*"), which <u>do</u> constitute Revenues under the 1978 Trust Agreement.

The formula for calculating the amount of Terminal A Remitted Revenues and the amount of Terminal A Recognized Revenues was set forth in the 2001 Trust Agreement.

In February 2019, the Authority refunded and defeased in their entirety the Terminal A Bonds with a portion of the proceeds of its Revenue Bonds, Series 2019-A (the "*2019-A Bonds*"), and a result of such refunding and defeasance, the Authority is no longer required to undertake the reletting allocation and can recognize all Terminal A Rental Revenues as Revenues under the 1978 Trust Agreement. The Authority anticipates that this change will generate approximately $20 million in additional Terminal A Recognized Revenues each year, which will be pledged, together with other Revenues, to pay debt service on Bonds. The table below reflects forecast Terminal A Recognized Revenues before and after the issuance of the 2019-A Bonds and the defeasance of the Terminal A Bonds, with the change beginning as of February 13, 2019, the date of delivery of the 2019-A Bonds ($ in millions).

	Total Terminal A Rental Revenues	Terminal A Remitted Revenues*	Terminal A Recognized Revenues**
Fiscal Year 2016	$45.4	$21.5	$23.9
Fiscal Year 2017	39.7	15.4	24.3
Fiscal Year 2018	42.2	16.3	25.9
Fiscal Year 2019†	44.0	9.5	34.5
Fiscal Year 2020	50.9	--	50.9
Fiscal Year 2021	52.7	--	52.7
Fiscal Year 2022	55.3	--	55.3
Fiscal Year 2023	57.1	--	57.1

* Do not constitute Revenues under 1978 Trust Agreement. Amounts reflected in this column exclude the Authority's PFC contribution.
** Do constitute Revenues under the 1978 Trust Agreement.
† Reflects actual data for the nine months ended March 31, 2019, and budgeted data for the remaining three months.

For purposes of the historical and forecasted Operating Results tables set forth under "SELECTED FINANCIAL DATA" herein, commencing February 13, 2019, all Terminal A Rental Revenues are included in Revenues and Net Revenues of the Authority, reflecting the impact of the refunding and defeasance of the Terminal A Bonds with proceeds of the 2019-A Bonds.

Port Properties Revenues

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

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

Investment Income

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

SELECTED FINANCIAL DATA

The table on page A-54 reflects historical Operating Results and Debt Service Coverage for the five most recent fiscal years and the nine-month periods ended March 31, 2018 and 2019, and has been prepared in accordance with accounting principles required by the 1978 Trust Agreement, which differ in some respects from generally accepted accounting principles ("*GAAP*"). Information for each of the five fiscal years is derived from the Authority's financial statements for the respective fiscal years. Financial statements of the Authority for fiscal year 2018 and comparative data for fiscal year 2017, together with the report thereon of Ernst & Young LLP, independent accountants, are included in APPENDIX B to the Official Statement. Information for the nine-month periods ended March 31, 2018 and 2019 under the caption "Historical Operating Results and Debt Service Coverage" is derived from the unaudited records of the Authority.

The table on page A-55 reflects forecasted Operating Results and Debt Service Coverage for fiscal year 2019 through fiscal year 2023 and was prepared in accordance with accounting principles required by the 1978 Trust Agreement. The prospective financial information included in this APPENDIX A has been prepared by and is the responsibility of the Authority's management. The Authority and its management believe that the prospective financial information included in this APPENDIX A and appearing on page A-55 has been prepared on a reasonable basis, reflecting its best estimates and judgments, and represents, to the best of management's knowledge and opinion, the Authority's expected course of action. However, because this information is a forecast, it should not be relied on as necessarily indicative of future results. The prospective financial information was prepared by the Authority in accordance with accounting principles required by the 1978 Trust Agreement in order to show forecasted debt service coverage; such information was not prepared with a view toward compliance with the guidelines established by the American Institute of Certified Public Accountants for preparation and presentation of prospective financial information.

Neither Ernst & Young LLP nor any other independent accountant has examined, compiled, reviewed, audited or performed any procedures with respect to the "Forecasted Operating Results and Debt Service Coverage" appearing on page A-55 or the Review of Airport Properties Net Revenues Forecasts included in APPENDIX C to the Official Statement, and, accordingly, Ernst & Young LLP does not express an opinion or any other form of assurance on such information or its achievability. Neither Ernst & Young LLP, nor any other independent accountant, assumes any responsibility for or has any association with the prospective financial information and any other information derived therefrom included elsewhere in this offering document.

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

The following tables show the calculation of Annual Debt Service Coverage of the Authority, as provided under the 1978 Trust Agreement, which equals the ratio of the Net Revenues of the Authority to the Annual Debt Service for such year. "*Net Revenues*" is defined in the 1978 Trust Agreement as the excess of Revenues over Operating Expenses. For the purpose of the calculations, proceeds of PFCs and CFCs have been excluded from Revenues because such proceeds have been excluded from Revenues under the 1978 Trust Agreement. In addition, for purposes of the historical Operating Results and Debt Service Coverage table on page A-54, Revenues do not include Terminal A Remitted Revenues. For purposes of the forecasted Operating Results and Debt Service Coverage table on page A-55, however, all Terminal A Rental Revenues received on or after February 13, 2019 are included as Revenues, reflecting the impact of the refunding and defeasance of the Terminal A Bonds with proceeds of the 2019-A Bonds. See "AUTHORITY REVENUES – Airport Properties Revenues – *Terminal A Rental Revenues*." As used in the historical Operating Results and Debt Service Coverage table on page A-54, "*Annual Debt Service*" is equal to the "Principal and Interest Requirements" on Bonds outstanding for the applicable fiscal year, less the capitalized interest paid from the applicable Project Fund. As used in the forecasted Operating Results and Debt Service Coverage table on page A-55, "*Net Debt Service*" is equal to the "Principal and Interest Requirements" on Bonds outstanding for the applicable fiscal year, less the capitalized interest paid from the applicable Project Fund, less debt service expected to be paid from Available Funds. See "SECURITY FOR THE 2019 BONDS – Use of Available Funds to Pay Debt Service" in the Official Statement and APPENDIX D to the Official Statement – Summary of Certain Provisions of the 1978 Trust Agreement – "Certain Definitions."

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

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

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HISTORICAL OPERATING RESULTS AND DEBT SERVICE COVERAGE UNDER THE 1978 TRUST AGREEMENT

(Fiscal Year Ended June 30, except as noted)
($ in thousands)

1978 Trust Agreement	2014	2015	2016	2017	2018	Nine Months Ended 3/31/2018	Nine Months Ended 3/31/2019
Revenues:							
Airport Properties - Logan							
Landing Fees	$ 92,896	$101,123	$104,489	$ 113,162	$ 119,190	$ 86,797	$ 89,322
Parking Fees	136,307	148,653	154,068	168,919	180,349	131,840	133,227
Utility Fees	16,798	18,274	17,960	15,284	15,349	11,527	10,558
Terminal Rentals (1)	129,487	133,897	142,176	161,816	180,331	135,790	145,298
Non-Terminal Building and Ground Rents	46,175	45,756	49,317	49,641	52,856	38,612	40,638
Concessions	76,003	81,270	86,645	98,093	113,588	84,678	98,856
Other	24,895	29,452	32,061	31,303	33,321	24,253	25,209
	522,561	558,425	586,716	638,218	694,984	513,497	543,108
Airport Properties - Hanscom	10,640	12,066	12,195	12,839	14,262	10,719	10,929
Airport Properties - Worcester	1,538	1,624	1,572	1,634	1,800	1,313	2,458
Total Airport Properties	534,739	572,115	600,483	652,691	711,046	525,529	556,495
Port Properties							
Maritime Operations (2)	62,068	68,316	74,259	81,738	93,831	70,905	76,451
Maritime Business Development/Real Estate (5)	23,653	22,295	24,619	30,021	30,446	23,701	38,411
	85,721	90,611	98,878	111,759	124,277	94,606	114,862
Total Operating Revenue	620,460	662,726	699,361	764,450	835,323	620,135	671,357
Investment Income (3)	3,208	3,830	5,689	7,902	12,265	8,206	15,490
Total Revenues	623,668	666,556	705,050	772,352	847,588	628,341	686,847
Operating Expenses (4):							
Airport Properties							
Logan	290,641	307,368	307,394	328,869	342,973	256,061	266,976
Hanscom	10,396	10,043	12,152	12,530	14,498	10,793	10,626
Worcester	7,497	9,026	9,408	9,672	10,680	7,629	9,128
	308,534	326,437	328,954	351,071	368,151	274,483	286,730
Port Properties							
Maritime Operations (2)	59,860	62,020	66,307	70,088	75,695	56,898	58,181
Maritime Business Development/Real Estate	15,166	20,012	16,725	19,082	21,384	14,931	17,327
	75,026	82,032	83,032	89,170	97,079	71,829	75,508
Total Operating Expenses	383,560	408,469	411,986	440,241	465,230	346,312	362,238
Net Revenues	$240,108	$258,087	$293,064	$ 332,111	$ 382,358	$ 282,029	$ 324,609
Annual Debt Service	$ 90,563	$ 98,500	$ 98,220	$ 101,456	$ 111,323	NA	NA
Annual Debt Service Coverage	2.65	2.62	2.98	3.27	3.43	NA	NA

(1) Prior to February 13, 2019, excludes the portion of Terminal A rental revenue that was pledged to pay debt service on the Terminal A Bonds. On February 13, 2019, the Terminal A Bonds were retired, and accordingly, after such date, all Terminal A rental revenue is included in Logan rental revenues. See "AUTHORITY REVENUES - Airport Property Revenues - *Terminal A Rental Revenues*."

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

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

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

(5) Revenues for the nine months ended March 31, 2019 include (i) a one-time $14.7 million payment related to the sale of the ground lease for Parcel F1 (John Hancock Building) in South Boston and (ii) a one-time $0.3 million payment to satisfy certain requirements of the Ground Lease.

FORECASTED OPERATING RESULTS AND DEBT SERVICE COVERAGE UNDER THE 1978 TRUST AGREEMENT

(Fiscal Year Ended June 30, except as noted)
($ in thousands)

1978 Trust Agreement	2019 (1)	2020	2021	2022	2023
Revenues:					
Airport Properties - Logan					
Landing Fees	$ 121,844	$ 126,656	$ 131,590	$ 142,860	$ 155,303
Parking Fees	179,281	182,938	186,841	189,711	190,283
Utility Fees	13,444	10,785	11,506	13,733	15,156
Terminal Rentals (2)	200,376	227,727	238,707	295,380	303,604
Non-Terminal Building and Ground Rents	54,142	54,964	55,804	56,663	57,535
Concessions	122,294	118,052	126,518	132,196	135,073
Other	32,908	34,328	35,437	36,321	36,932
	724,288	755,450	786,402	866,864	893,887
Airport Properties - Hanscom	14,289	14,100	14,488	14,915	15,338
Airport Properties - Worcester	2,964	2,702	2,796	2,888	2,976
	741,541	772,252	803,686	884,666	912,202
Port Properties					
Maritime Operations	101,393	97,096	100,916	108,402	112,977
Real Estate (3)	43,372	27,652	29,764	34,979	37,938
	144,765	124,748	130,681	143,381	150,916
Total Operating Revenue	886,306	897,000	934,367	1,028,047	1,063,117
Investment Income (4)	18,166	10,000	13,702	14,831	17,074
Total Revenues	904,471	907,000	948,069	1,042,879	1,080,192
Operating Expenses (5):					
Airport Properties					
Logan	365,597	386,452	402,342	423,687	440,558
Hanscom	14,276	15,774	16,378	16,969	17,562
Worcester	13,870	16,104	16,745	17,332	17,913
	393,743	418,331	435,466	457,988	476,033
Port Properties					
Maritime Operations	77,152	80,596	82,277	86,193	89,215
Real Estate	26,146	22,502	23,161	24,067	24,909
	103,298	103,097	105,437	110,260	114,125
Total Operating Expenses	497,041	521,428	540,903	568,248	590,158
Net Revenues	$ 407,431	$ 385,572	$ 407,166	$ 474,630	$ 490,034
Total Debt Service including Debt Backed by PFCs (6)	142,597	163,600	194,645	219,512	224,468
PFC Revenue to be applied to Debt (7)	(3,360)	(11,572)	(28,085)	(32,269)	(32,269)
Net Debt Service	$ 139,238	$ 152,028	$ 166,561	$ 187,244	$ 192,199
Annual Debt Service Coverage	2.93	2.54	2.44	2.53	2.55

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

(1) Reflects actual data for the nine months ended March 31, 2019, and budgeted data for the remaining three months.
(2) Commencing in fiscal year 2020, includes all Terminal A Rental Revenues; fiscal year 2019 includes a portion of Terminal A Rental Revenues. See "AUTHORITY REVENUES – Airport Properties Revenues – *Terminal A Rental Revenues*."
(3) Revenues for the nine months ended March 31, 2019 include (i) a one-time $14.7 million payment related to the sale of the ground lease for Parcel F1 (John Hancock Building) in South Boston and (ii) a one-time $0.3 million payment to satisfy certain requirements of the Ground Lease.
(4) Excludes investment income earned by and deposited into Construction, PFC and CFC Funds.
(5) Includes allocation of all operating expenses related to Authority General Administration.
(6) Includes the 2019 Bonds. Assumes the Authority will issue (i) $491.6 million par amount of 2020 Bonds in fiscal year 2021 at a 6.0% interest rate and no capitalized interest, and (ii) $152.0 million par amount of 2021 Bonds in fiscal year 2022 at a 6.0% interest rate and no capitalized interest. Includes the portion of the 2019-A Bonds, 2019-C Bonds, 2020 Bonds and 2021 Bonds debt service expected to be paid from PFCs (see "CAPITAL PROGRAM – Funding Sources – 2019 Bond Proceeds" and "– Future Bond Proceeds").
(7) Represents PFC revenues expected to be used to offset a portion of the debt service on the 2019-A Bonds, 2019-C Bonds, 2020 Bonds and 2021 Bonds (see "CAPITAL PROGRAM – Funding Sources – 2019 Bond Proceeds" and "– Future Bond Proceeds" and "MANAGEMENT'S DISCUSSION OF FORECAST ASSUMPTIONS").

MANAGEMENT'S DISCUSSION OF HISTORICAL OPERATING RESULTS

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

Total Revenues according to 1978 Trust Agreement accounting in fiscal year 2018 were $847.6 million, compared to $772.4 million in fiscal year 2017, while Operating Expenses increased to $465.2 million in fiscal year 2018 from $440.2 million in fiscal year 2017 resulting in Net Revenues of $382.4 million and $332.1 million in fiscal years 2018 and 2017, respectively. Logan Airport is the primary source of the Authority's Revenues, Net Revenue and Operating Expenses. For a discussion of the differences between the accounting principles required by the 1978 Trust Agreement and GAAP, see Note 2 to the Financial Statements in APPENDIX B to the Official Statement. Revenues and Net Revenues do not include PFC revenues, which are required under federal law to be applied to certain FAA-authorized capital projects at the Airport and are not pledged for the benefit of holders of the Bonds, or CFC revenues, which are pledged as security for the CFC Revenue Bonds. See "OTHER OBLIGATIONS – CFC Revenue Bonds." Revenues and Net Revenues also do not include Terminal A Remitted Revenues. See "AUTHORITY REVENUES – Airport Properties Revenues – *Terminal A Rental Revenues*." Operating revenue and expense figures for the Airport Properties and Port Properties do not include certain items, particularly expense items such as payments in lieu of taxes, interest and depreciation and amortization, properly allocable to such properties under GAAP.

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

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

Airport Properties

Airport Properties Net Revenues (Airport Properties Revenues less Airport Properties Operating Expenses), increased from fiscal year 2018 to fiscal year 2017 by 13.7%. The number of passengers using Logan Airport in fiscal year 2018 was 5.4% greater than in the prior fiscal year. Landed weights were 5.0% higher than the prior fiscal year. Parking exits were lower in fiscal year 2018 than in the prior fiscal year, with parking revenues 6.8% greater than revenues from fiscal year 2017 due to a $3.00 per day increase in parking rates commencing July 1, 2017. Logan Airport generated approximately $695.0 million of Revenues and incurred $343.0 million of Operating Expenses in fiscal year 2018, compared to $638.2 million of Revenues and $328.9 million of Operating Expenses in fiscal year 2017. Operating revenue and expense figures for Logan Airport stated in this paragraph do not include certain items, particularly expense items, such as interest, depreciation and amortization, properly allocable to Logan Airport under GAAP.

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

Landing Fees. Landing fee revenues at the Airport increased from $113.2 million in fiscal year 2017 to $119.2 million in fiscal year 2018. During this period, the landing fee rate per thousand pounds of landed weight decreased from $4.64 to $4.60. Under current policy, any variance between the landing fees collected and the actual costs of operating the airfield during a fiscal year is calculated after the fiscal year ends, and the adjustment is either invoiced to (in the case of a shortfall) or paid to (in the case of a surplus) the air carriers and other aeronautical users. Landed weights at Logan Airport increased from approximately 24,040,957 thousand pounds in fiscal year 2017 to 25,249,192 thousand pounds in fiscal year 2018. A general shift to larger aircraft types as airlines upgraded their fleets and several new long-haul international air carriers commenced services collectively contributed to the increase in landed weights.

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

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

As described under "AIRPORT PROPERTIES – Airport Facilities – Lease Arrangements for Terminal Facilities," the Authority currently leases 79 of its 97 contact gates to various carriers serving the Airport. See the inside back cover of this Official Statement for a map of the Airport's terminal facilities. Rental revenue from Terminals (excluding the Terminal A Remitted Revenues) totaled $161.8 million in fiscal year 2017 and $180.3 million in fiscal year 2018. See "AUTHORITY REVENUES – Airport Properties Revenues – *Terminal A Rental Revenues*." Rental income from non-terminal buildings and ground rents other than Terminals totaled $49.6 million in fiscal year 2017 and $52.9 million in fiscal year 2018.

Parking Fees. Airport parking revenues increased from $168.9 million in fiscal year 2017 to $180.3 million in fiscal year 2018 due to a $3.00 per day increase in parking rates commencing July 1, 2017. Additional rate increases of $3.00 per day commencing July 1, 2019 and July 1, 2021 have been approved by the Board for all on-Airport parking lots, including the Economy Parking Garage. Parking fees are generated according to parking rates set by the Authority. The Authority does not share parking fees with the carriers as an offset to either landing fees or terminal rents; rather, the Authority retains the business risk and the return of this cost center. The number of commercial parking spaces at the Airport is subject to the SIP Parking Limitation. See "AIRPORT PROPERTIES – Airport Facilities – Parking Facilities."

Concessions. Revenues from concessions increased from $98.1 million in fiscal year 2017 to $113.6 million in fiscal year 2018, primarily due to higher passenger volume coupled with a new concessions management agreement with MarketPlace Logan LLC ("*MarketPlace Logan*") that went into effect in fiscal year 2018. MarketPlace Logan is providing new restaurant and retail offerings for Logan Airport customers while also allowing the Authority to participate in a larger share of the revenue versus prior management agreements. Concession revenues include payments made by rental car companies that operate at the Airport and commissions from the following concessions: food and beverage, news and gifts, duty free shops, other specialty shops, ground transportation and other concessions. Ground transportation services include taxis, TNCs and buses and limousines. Revenues from ground transportation services increased from $11.5 million in fiscal year 2017 to $15.4 million in fiscal year 2018, as fiscal year 2018 was the first full year the Authority collected TNC revenues.

Hanscom Field. During fiscal year 2018, Revenues from operations at Hanscom Field represented approximately 1.7% of the total Revenues of the Authority, and Hanscom's Operating Expenses constituted approximately 3.1% of the Authority's Operating Expenses. In fiscal year 2018, Hanscom Field contributed $14.3 million of Revenue, with Operating Expenses of $14.5 million, yielding an operating deficit before debt service or other capital expenses of approximately $236,000. In fiscal year 2017, Hanscom Field generated an operating surplus before debt service or other capital expenses of approximately $309,000. The primary driver for the increase in operating expenses is for property repairs related to flooding from a July 13, 2017 rain storm; most of this expense is expected to be recovered through an insurance claim. See "AIRPORT PROPERTIES – Hanscom Field."

Worcester Regional Airport. In fiscal year 2018, Revenues from operations at Worcester Regional Airport represented less than 1% of the total Revenues of the Authority and Worcester's Operating Expenses constituted approximately 2.3% of the Authority's Operating Expenses and represented an operating loss of approximately $8.9 million before debt service and other capital expenses. In fiscal year 2017, Worcester Regional Airport generated an operating loss of approximately $8.0 million before debt service and other capital expenses. Worcester Airport had $1.8 million in operating revenues in fiscal year 2018, an increase of $166,000 compared to the prior year.

Port Properties

Maritime Operations includes container activity, cruise passenger activity and automobile import/export activity. Maritime Real Estate includes commercial real estate development, maritime real estate development and asset management. Project types and assets include office, hotel, residential, retail, seafood, warehouse and parking. With the exception of the Boston Fish Pier, these projects are developed and operated by private third-party entities that have entered into ground leases with the Authority. The department also negotiates numerous license agreements for shorter term and temporary uses of Authority property. Since fiscal year 2006, the Authority has experienced annual Port Properties operating surpluses.

In fiscal year 2018, the Revenue attributable to the Port Properties totaled approximately $124.3 million, or approximately 14.7% of the Revenues of the Authority, and the Port Properties accounted for approximately $97.1 million of Operating Expenses, or approximately 20.9% of the Authority's Operating Expenses. In fiscal year 2018, the Port Properties realized a surplus of $27.2 million in Net Revenues, following a surplus of $22.6 million in fiscal year 2017. The Net Revenue from Maritime Operations, which includes the auto, container, cruise and seafood business lines, was a surplus of $18.1 million for fiscal year 2018, while the Net Revenue from Maritime Real Estate was a surplus of $9.1 million in fiscal year 2018. Revenues from Maritime Real Estate include a one-time $4.5 million closing payment from the developer of Parcel K in South Boston. Revenues from Maritime Real Estate for the nine months ending March 31, 2019 include (i) a one-time $14.7 million payment related to the sale of the ground lease for Parcel F1 (John Hancock Building) in South Boston and (ii) a one-time $0.3 million payment to satisfy certain requirements of the ground lease. Maritime Real Estate operating expenses for the nine months ending March 31, 2019 include a one-time $3.0 million net reimbursement to Millennium Partners for certain upfront costs in connection with the release of their development rights for Parcel 5 of the MMT. Over the period shown, the Authority has pursued a policy of seeking compensatory pricing, aggressively negotiating new lease terms when possible, revenue development through more intense use of the Port Properties and a marketing program designed to increase the volume of containers handled and the number of cruise passengers who embark or disembark in Boston. In fiscal year 2018, revenue from container operations increased by $9.0 million or 14.0% as Conley Terminal processed a record 161,130 containers, a 10.7% increase over 145,540 containers processed in fiscal year 2017.

Investment Income. Investment income increased to $12.3 million in fiscal year 2018 from $7.9 million in fiscal year 2017, as the Authority had more cash available to invest and was able to take advantage of a higher interest rate environment.

MANAGEMENT'S DISCUSSION OF FORECAST ASSUMPTIONS

The following discussion elaborates on the information contained in the above table entitled "Forecasted Operating Results and Debt Service Coverage Under the 1978 Trust Agreement" and reflects the Authority's current planning and expectations. The table and ensuing discussion contain pro-forma forecasts for the period covering fiscal year 2019 through fiscal year 2023. This prospective information was prepared by the Authority in accordance with accounting principles required by the 1978 Trust Agreement in order to show projected debt service coverage; such information was not prepared with a view toward compliance with the guidelines established by the American Institute of Certified Public Accountants for preparation and presentation of prospective financial information. The forecasts were prepared by the Authority's staff. LeighFisher prepared a review of the Authority's Airport Net Revenues Forecasts in connection with the issuance of the 2019 Bonds. In the opinion of LeighFisher, the assumptions upon which the Authority's forecasts for the Airport Properties are based provide a reasonable basis for such forecasts. See APPENDIX C to the Official Statement, which should be read in its entirety for an understanding of the forecasts for the Airport Properties and the key underlying assumptions therein.

For fiscal year 2019, projections are based on the Authority's unaudited actual results through March 31, 2019 and the forecasted budget for the remaining three months of fiscal year 2019. Revenues were forecasted to be $904.5 million for fiscal year 2019 and the forecasted Operating Expenses total $497.0 million. Through March 31, 2019, operating revenues of $671.4 million were 11.2% above budget and $67.5 million above the same time period in fiscal year 2018. Total Revenues of $686.8 million were $75.4 million, or 12.3% above budget for the same period. For the same period, Operating Expenses of $362.2 million were $0.9 million or 0.3% below budget for the first nine months of fiscal year 2019. Net revenues of $324.6 million for the first nine months of the fiscal year were $76.4 million or 30.8% greater than budgeted.

The forecasts reflected in the table assume: (a) an increase of operating costs in fiscal year 2019, compared to fiscal year 2018 actual results, of (i) 6.6% at Logan Airport, (ii) 6.4% at the Port Properties, and (iii) 29.9% at Worcester Regional Airport, primarily due to the additional ARFF operations assumed by the Authority; (b) a decrease in operating costs at Hanscom Field of 1.5% in fiscal year 2019; (c) growth of baseline operating costs at 4.9% on average annually in fiscal years 2019 and thereafter; (d) inflation of capital costs (to the mid-point of construction) at 4.0% annually; (e) investment income (other than for investment agreements currently in effect) at a rate of 2.0% in fiscal year 2020 and 1.8% in fiscal year 2021 and thereafter; (f) interest rates of 6.0% on the currently planned future Bond issues in fiscal year 2021 and fiscal year 2022; (g) completion dates for capital projects as currently contained in the FY19-FY23 Capital Program; (h) the addition of staff and contract services in future years, as necessary, to operate new facilities as they are placed in service; (i) the application in fiscal year 2020 onwards of approximately $8.8 million per year of PFCs to pay a portion of the principal of and interest on the 2019-A Bonds; (j) the application in fiscal year 2020 onwards of approximately $2.9 million per year of PFCs to pay a portion of the principal of and interest on the 2019-C Bonds; (k) the application in fiscal year 2021 onwards of approximately $16.4 million per year of PFCs to pay a portion of the principal of and interest on the 2020 Bonds;[3] (l) the application in fiscal year 2022 onwards of approximately $4.2 million per year of PFCs to pay a portion of the principal of and interest on the 2021 Bonds;[3] and (m) the inclusion of a portion of Terminal A Rental Revenues as Revenues in fiscal year 2019 and all Terminal A Rental Revenues as Revenues commencing in fiscal year 2020. See "AUTHORITY REVENUES – Airport Properties Revenues – *Terminal A Rental Revenues*."

Pursuant to amendments to the 1978 Trust Agreement expected to be effective upon issuance of the 2019 Bonds, if Available Funds are pledged or irrevocably committed or are held by a fiduciary and are to be set aside exclusively for the payment of principal of, interest or premium, if any, on specified Bonds pursuant to a resolution of the Authority (and are not otherwise required for payment of another Series of Bonds), then the principal, interest and/or premium to be paid from such Available Funds or from earnings thereon shall be disregarded and not included in calculating debt service coverage requirements under the 1978 Trust Agreement. See the sections entitled "SECURITY FOR THE 2019 BONDS – Covenants as to Fees and Charges" and "SECURITY FOR THE 2019 BONDS – Modifications of the 1978 Trust Agreement" in the Official Statement. Although it is the expectation of the Authority's management that the Authority will annually designate PFCs as Available Funds to pay a portion of the principal of and interest on the 2019-A Bonds, the 2019-C Bonds, the 2020 Bonds and the 2021 Bonds for each next succeeding fiscal year, there can be no assurance that the Authority will in fact irrevocably commit PFCs in the assumed amounts in each fiscal year to the payment of such debt service. If PFCs are not irrevocably committed to pay such debt service, any debt service that would have been paid with PFCs will instead be paid from Net Revenues. The forecast table, therefore, presents the debt service coverage calculation both including and excluding the Available Funds expected to be used to pay debt service on Bonds outstanding during the forecast period.

The Authority believes that the forecasts reflected in the table are conservative in nature. For example, the financial forecast assumes that enplaned passengers in fiscal year 2019 will be 6.0% higher than that in fiscal year 2018; actual passenger growth, however, for the nine months ending March 31, 2019 was 6.8% higher than passenger growth for the same period in the prior year. Passenger levels are then forecast to increase 2.5% in fiscal year 2020 and 1.0% in fiscal years 2021, 2022 and 2023. These forecasts do not assume any significant future disruptions to air travel or cessation of service by any air carrier now serving the Airport. This forecast is intended to be conservative to aid in financial planning and can be contrasted with the Authority's planning forecast and the FAA's terminal area forecast for Logan Airport. See APPENDIX C – Boston Logan International Airport Market Analysis under the heading "Review of Massport Activity Forecasts." If the forecasted Revenues are not realized in a material way, then the Authority expects that it will not execute all of the projects listed in the FY19-FY23 Capital Program. The Authority's willingness and ability to reduce capital spending when events so require was demonstrated in its response to the events of September 11, 2001 and in the subsequent adherence to the financial recovery plan put in place thereafter. In addition, forecasted Revenues do not include PFCs or CFCs collected by the Authority. See "CAPITAL PROGRAM – Funding Sources – Passenger Facility Charges" and "– Customer Facility Charges."

Airport Properties

Forecasted Revenues from landing fees and terminal rentals at the Airport reflect the periodic revision of such charges at rates designed to recover the net annual cost of providing these Airport facilities. Net annual costs include all operating expenses and amortization of capital costs, less any PFC revenues applied to these projects and any federal grant funds received for these projects. For the five-year period from fiscal year 2019 to fiscal year 2023, landing fee revenues at the Airport are forecasted to increase at an average annual rate of 5.5%. The increases over

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[3] The use of PFCs to pay debt service on a portion of the 2020 Bonds and the 2021 Bonds is subject to the receipt of FAA approval for PFC funding for the projects to be financed with proceeds thereof. If these projects are not approved for PFC funding, or if the approved amount is less than the Authority's PFC funding request, the Authority would be required to pay debt service on such Bonds from Net Revenues.

the forecast period are attributable to the inclusion in the rate base of airfield capital costs, including allocable capital costs from other Airport capital projects and increased operating costs.

Terminal building rental revenues at the Airport from fiscal year 2019 through fiscal year 2023 are projected to increase at an average annual rate of 11.2%, reflecting the additional build out of terminal facilities coming into service and the inclusion of all Terminal A Rental Revenues in the calculation of Revenues, commencing February 13, 2019. In fiscal year 2019, terminal building rental revenues at the Airport are forecast to be $200.4 million, which is 11.1% greater than fiscal year 2018. The increase forecasted for fiscal year 2019 reflects additional allocable capital costs from Airport capital projects, increased operating costs and the recognition of a portion of Terminal A Rental Revenues in the calculation of Revenues. See "AIRPORT PROPERTIES – Airport Facilities; Lease Arrangements for Terminal Facilities." Terminal building rentals also include baggage fees calculated to recover the Authority's cost of operating baggage screening in unleased space and per passenger fees that recover Terminal E costs related to international passengers and unleased, common-use space.

In fiscal year 2019, Revenues from non-terminal and ground rents at the Airport are forecasted to increase approximately 2.4%. The Board has voted to increase Logan Airport parking rates by $3.00/day in each of fiscal years 2020 and 2022. The Authority is forecasting that the increase in parking rates, offset by a slight decrease in total parking exits in the short term due to the higher rates, will add approximately $3.6 million in parking revenues, on average, in each of fiscal years 2020 and 2022, which amounts are expected to be used to further fund operating and capital projects. From fiscal year 2019 through fiscal year 2023, concession revenues at the Airport, which include payments made by rental car companies that operate at the Airport and commissions from the following concessions: food and beverage, news and gifts, duty free shops, other specialty shops, ground transportation and other concessions, are forecasted to increase at an average annual rate of 3.6%, reflecting the impact of the new concessions management agreement with Marketplace Logan that went into effect in fiscal year 2018, provides new restaurant and retail offerings for Logan Airport customers and gives the Authority participation in a larger share of the revenue than was the case with prior management agreements. In fiscal year 2020, ground transportation services are forecasted to increase approximately 40.4% due to the Authority's addition of a $3.25 drop off fee levied on TNCs starting no earlier than October 1, 2019. See APPENDIX D – Review of Airport Properties Net Revenues Forecasts under the heading "Key Factors Affecting the Net Revenues Forecast – Airport Property Revenues – Concessions."

From fiscal year 2019 through fiscal year 2023, Revenues at Hanscom Field are forecasted to increase at an average annual rate of 1.5%. Expenses are forecasted to increase at an average annual rate of 4.0% from fiscal year 2019 through fiscal year 2023, which reflects the Authority's addition of ARFF staff, as Hanscom Air Force Base ceased providing ARFF services in April 2019. Revenues at Worcester Regional Airport are forecasted to increase by 64.7% in fiscal year 2019, decline by 8.8% in fiscal year 2020, and then increase 3.3% thereafter. The increase in fiscal year 2019 reflects a one-time $0.7 million payment from Rectrix for back-billed rent and greater activity at Worcester Regional Airport on account of new Philadelphia service. See "AIRPORT PROPERTIES – Worcester Regional Airport." Worcester Regional Airport operating expenses are forecasted to increase 29.9% in fiscal year 2019, primarily due to the additional ARFF operations assumed by the Authority, and then increase by 16.1% in fiscal year 2020 and then 3.6% thereafter. Assuming a combination of low inflation and limited programmatic growth thereafter, Operating Expenses of the Airport Properties are forecasted to increase at an average annual rate of 5.3% from fiscal year 2019 through fiscal year 2023.

Forecasted Revenues and Operating Expenses of the Airport are based in part on assumptions regarding future levels of total passengers. The financial forecast assumes that enplaned passengers in fiscal year 2019 will be 6.0% higher than that in fiscal year 2018 (based on actual Airport passenger growth of 6.8% for the first nine months of the fiscal year (through March 2019) and growth estimates for the remainder of the fiscal year), and then estimates of 2.5% growth in fiscal year 2020 and 1.0% growth per year in 2021, 2022 and 2023). Such estimates reflect the Authority's preference for using conservative estimates in its financial planning.

The following table shows forecast total enplaned passengers and total passengers at the Airport from fiscal year 2019 through fiscal year 2023, as well as forecast revenue per enplaned passenger (both including and excluding PFCs expected to be available to pay debt service), debt per enplaned passenger (both including and excluding debt expected to be payable from PFCs) and airline cost per enplaned passenger, for the same period.

Logan Airport – Growth Forecast
(000s)

	FY 2019	FY 2020	FY 2021	FY2022	FY2023
Enplaned Passengers	20,814	21,335	21,548	21,764	21,981
Total Passengers[1]	41,757	42,801	43,229	43,662	44,098
Percentage Change	--	*2.5%*	*1.0%*	*1.0%*	*1.0%*
Logan Revenue Per Enplaned Passenger[2]					
Without PFCs available to pay Debt Service[3]	$34.80	$35.41	$36.50	$39.83	$40.67
With PFCs available to pay Debt Service[4]	$34.96	$36.01	$37.85	$41.36	$42.18
Debt Per Enplaned Passenger[5]					
Without PFC Principal Amount[6]	$75.18	$90.50	$100.99	$101.85	$97.65
With PFC Principal Amount[7]	$80.63	$97.48	$116.42	$118.90	$114.01
Airline Cost Per Enplaned Passenger (CPE)[2]	$15.19	$16.31	$16.88	$19.81	$20.52

[1] Excludes general aviation.

[2] Reflects actual data for the nine months ended March 31, 2019, and budgeted data for the remaining three months of fiscal year 2019.

[3] Excludes PFC revenues expected to be used to offset debt service on the 2019-A Bonds, 2019-C Bonds, 2020 Bonds and 2021 Bonds (see "CAPITAL PROGRAM – Funding Sources – 2019 Bond Proceeds" and "- Future Bond Proceeds").

[4] Includes PFC revenues expected to be used to offset debt service on the 2019-A Bonds, 2019-C Bonds, 2020 Bonds and 2021 Bonds (see "CAPITAL PROGRAM – Funding Sources – 2019 Bond Proceeds" and "- Future Bond Proceeds").

[5] Calculation based upon outstanding principal amount of Bonds. Assumes the Authority will issue (i) $491.6 million par amount of 2020 Bonds in fiscal year 2021 at a 6.0% interest rate and no capitalized interest, of which $187.9 million is expected to be payable from PFCs, and (ii) $152.0 million par amount of 2021 Bonds in fiscal year 2022 at a 6.0% interest rate and no capitalized interest, of which $48.0 million is expected to be payable from PFCs.

[6] Excludes the principal amount of the 2019-A Bonds, 2019-C Bonds, the 2020 Bonds and the 2021 Bonds expected to be paid from PFCs. (see "CAPITAL PROGRAM – Funding Sources – 2019 Bond Proceeds" and "– Future Bond Proceeds")

[7] Includes the principal amount of the 2019-A Bonds, 2019-C Bonds, 2020 Bonds and 2021 Bonds expected to be paid from PFCs. (see "CAPITAL PROGRAM – Funding Sources – 2019 Bond Proceeds" and "– Future Bond Proceeds").

The Airport Market Analysis states that the Authority's baseline financial forecast of enplanement growth at the Airport of 6.0% in fiscal year 2020, 2.5% in fiscal year 2021 and 1.0% per year thereafter is reasonable and conservative compared to the FAA forecast and the Airport's historical annual growth. Further, the Airport Market Analysis states that the Authority's planning forecast of enplanement growth at the Airport of 2.4% per year between 2019 and 2023 represents a reasonable projection of future passenger activity at the Airport.

The Authority has assumed that it will receive approximately $38.1 million of federal TSA, AIP entitlement, noise and other discretionary grant reimbursements during the period from fiscal year 2019 through fiscal year 2023. If these funds are not received, projected landing fees and/or checked bag fees could increase over the coming years. There can be no assurance that such AIP or TSA grant funds will be available in the amounts or at the times projected. See "AVIATION INDUSTRY CONSIDERATIONS – Considerations Regarding Other Sources of Revenue; Federal Grants-in-Aid" and "– Considerations Regarding Other Sources of Revenue; FAA Reauthorization and Level of Federal Airport Grant Funding."

Review of the Boston Regional Market Analysis

The Market Analysis Report set forth in APPENDIX C to the Official Statement was prepared by ICF in connection with the issuance of the 2019 Bonds. Such report is set forth herein in reliance upon the knowledge and experience of such firm as airport consultants.

Review of Airport Properties Net Revenues Forecasts by Consultants

LeighFisher prepared a review of the Authority's Airport Properties Net Revenue Forecasts in connection with the issuance of the 2019 Bonds, which is included as APPENDIX D to the Official Statement. The review should be read in its entirety for a fuller understanding of the forecasts for the Airport Properties and the key underlying assumptions therein. In the opinion of LeighFisher, the assumptions upon which the Authority's forecasts for the

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

Port Properties

Maritime Operations Revenues are forecasted to increase 7.4% in fiscal year 2019, and then increase at an average annual rate of 2.8% thereafter through fiscal year 2023, while expenses are projected to increase 1.9% in fiscal year 2019, and then increase at an average annual rate of 3.7% thereafter through fiscal year 2023. Maritime Operations is expected to have a surplus of $24.2 million in Net Revenues in fiscal year 2019, primarily due to the increased containers serviced at Conley Terminal. The estimated fiscal year 2019 container volume is expected to be approximately 169,000 containers. Container volumes are forecasted to be 164,000 in fiscal year 2020 to reflect uncertain market conditions impacting the business, and then increase 2.0% in fiscal year 2021, increase by 6.0% in fiscal year 2022 (to reflect anticipated container activity on account of Conley Terminal investments), and then increase by 2.0% in each year thereafter through fiscal year 2023.

Revenues from Maritime Real Estate are forecasted to increase 45.1% in fiscal year 2019, largely due to a one-time $14.7 million payment related to the sale of the ground lease for Parcel F1 (John Hancock building) in South Boston and a related one-time $0.3 million payment to satisfy certain requirements of the ground lease. Excluding these one-time payments, revenues are forecast to grow at an average annual rate of 7.8% from fiscal year 2020 through fiscal year 2023, reflecting the development of certain South Boston parcels. Revenue forecasts are not included for projects currently without signed leases. See "PORT PROPERTIES – Maritime Properties." Maritime Real Estate Operating Expenses are forecasted to increase 22.3% in fiscal year 2019, largely due to a one-time $3.0 million net reimbursement to Millennium Partners for certain upfront costs in connection with the release of their development rights for Parcel 5 of the MMT. Excluding the one-time expenditures, the forecast assumes a 1.9% average annual increase in expenses from fiscal year 2020 through fiscal year 2023.

Investment Income

The Authority's forecasts of investment income assume that existing investments are held until maturity at their respective stated rates of interest and that available cash will be reinvested at an interest rate of 2.0% in fiscal year 2020 and 1.8% in fiscal year 2021 and thereafter.

Debt Service and Coverage

The Authority's forecasts include the issuance of additional Bonds in fiscal years 2021 and 2022 to provide adequate capital for the Bond funded projects identified in the FY19-FY23 Capital Program. See "CAPITAL PROGRAM – Funding Sources." In addition to the 2019 Bonds, the Authority plans to issue future bonds to fund a portion of the FY19-FY23 Capital Program, including: (i) $448.2 million of project costs in fiscal year 2021 (2020 Bonds), of which $169.6 million is expected to be paid from PFCs, and (ii) $138.8 million in fiscal year 2022 (2021 Bonds), of which $43.3 million is expected to be paid from PFCs. There can be no assurance, however, that the amount and timing of these Bond issues will be as set forth in the preceding sentence or that PFCs will, in fact, be made available therefor in the amounts noted. The 2020 Bonds and the 2021 Bonds are assumed to include no capitalized interest during the construction period and each bear interest at rates of 6.0%. The future bond issues are assumed to be secured by the Pooled Reserve Subaccount and therefore include bond proceeds to fully fund the Pooled Reserve Subaccount to an amount equal to the Reserve Requirement. See "SECURITY FOR THE 2019 BONDS – Reserve Account" in the Official Statement. The Authority does not project that this amount of additional debt will have an adverse impact on its ability to comply with the coverage requirements of the 1978 Trust Agreement.

Forecasted coverage for the Authority's forecasted annual debt service, inclusive of Available Funds actually or expected to be committed to pay debt service on Bonds, is set forth in the table on page A-55. There can be no assurance, however, that these coverage levels will be achieved. For a discussion of the requirements relating to issuance of additional Bonds, see the sections entitled "SECURITY FOR THE 2019 BONDS – Additional Bonds" in the Official Statement.

The Authority expects that the non-Bond funded projects of the FY19-FY23 Capital Program will be financed from the expenditure of proceeds from commercial paper, the application of PFCs on a pay-as-you-go basis, the application of CFCs, private sources of capital, federal and other grants and cash flow from operations. The Authority's capital program is designed to be modular, and the Authority expects to undertake projects only after sufficient funding has been secured.

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DEBT SERVICE REQUIREMENTS UNDER THE 1978 TRUST AGREEMENT

The following table sets forth debt service on the Authority's outstanding Bonds[(1)] and the 2019 Bonds for each fiscal year in which such Bonds will be outstanding (rounded to the nearest dollar). Column totals may not add due to rounding.

Year Ending July 1	Other Outstanding Bonds Debt Service[(2)(5)]	2019 Bonds Debt Service[(3)(5)]		Total Debt Service[(4)]
		Principal	Interest	
2020	$134,426,495	$1,110,000	$1,697,258	$137,233,753
2021	137,139,349	1,200,000	3,201,083	141,540,432
2022	137,458,458	3,530,000	12,603,158	153,591,616
2023	135,332,448	8,035,000	20,914,917	164,282,364
2024	131,962,458	8,395,000	21,235,000	161,592,458
2025	132,213,300	8,825,000	20,815,250	161,853,550
2026	132,427,956	9,265,000	20,374,000	162,066,956
2027	132,609,315	9,730,000	19,910,750	162,250,065
2028	121,681,463	10,215,000	19,424,250	151,320,713
2029	112,117,823	10,730,000	18,913,500	141,761,323
2030	104,592,438	11,260,000	18,377,000	134,229,438
2031	104,700,825	11,830,000	17,814,000	134,344,825
2032	104,749,575	12,420,000	17,222,500	134,392,075
2033	104,783,325	13,040,000	16,601,500	134,424,825
2034	91,990,075	13,690,000	15,949,500	121,629,575
2035	91,998,075	14,375,000	15,265,000	121,638,075
2036	80,638,850	15,095,000	14,546,250	110,280,100
2037	80,710,775	15,855,000	13,791,500	110,357,275
2038	78,058,100	16,635,000	12,998,750	107,691,850
2039	76,410,350	17,470,000	12,167,000	106,047,350
2040	76,407,025	15,410,000	11,293,500	103,110,525
2041	66,503,150	16,180,000	10,523,000	93,206,150
2042	66,502,650	16,985,000	9,714,000	93,201,650
2043	58,841,400	17,830,000	8,864,750	85,536,150
2044	58,840,900	18,730,000	7,973,250	85,544,150
2045	52,568,850	28,450,000	7,036,750	88,055,600
2046	40,851,900	29,870,000	5,763,250	76,485,150
2047	6,158,250	31,370,000	4,426,150	41,954,400
2048	--	32,930,000	3,021,950	35,951,950
2049	--	34,585,000	1,547,950	36,132,950
	$2,652,675,574	$455,045,000	$383,986,716	$3,491,707,290

(1) Does not include commercial paper or debt service on obligations of the Authority not secured on a parity with the Bonds under the 1978 Trust Agreement, such as subordinated indebtedness, CFC Revenue Bonds (defined herein) and special facilities revenue bonds. For a description of such other obligations, see "OTHER OBLIGATIONS."

(2) The figures shown in this column combine Bond Debt Service for the outstanding 2008-C Bonds, 2010 Bonds, 2012 Bonds, 2014 Bonds, 2015 Bonds, 2016 Bonds, 2017 Bonds and 2019-A Bonds. Includes portion of 2019-A Bonds expected to be paid from PFCs.

(3) Includes portion of 2019-C Bond debt service expected to be paid from PFCs (see "CAPITAL PROGRAM – Funding Sources – 2019 Bond Proceeds").

(4) Totals may not add due to rounding.

(5) Amounts shown are net of capitalized interest.

OTHER OBLIGATIONS

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

CFC Revenue Bonds

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

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

As of July 2, 2019, the 2011 CFC Revenue Bonds in an aggregate principal amount of $186.8 million are the only CFC Revenue Bonds outstanding under the CFC Trust Agreement.

Special Facilities Revenue Bonds

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

As of July 2, 2019, the Authority will have one series of special facilities revenue bonds outstanding, consisting of the $81.1 million Special Facilities Revenue Bonds (BOSFUEL Project), Series 2007.

The Authority is under no obligation to assume the liability for the special facilities revenue bonds listed above or to direct revenue to pay debt service on any special facilities revenue bonds outstanding.

Subordinated Indebtedness

The Authority has issued, and may in the future issue additional, subordinated indebtedness to finance various capital projects, the principal of and interest on which is payable solely from funds on deposit in the Improvement and Extension Fund in a separate account not subject to the pledge of the 1978 Trust Agreement or the CFC Trust Agreement.

As of July 2, 2019, the Authority will have $74.0 million aggregate principal amount of subordinated indebtedness outstanding, consisting of its Subordinated Revenue Bonds, Series 2000-A, 2000-B and 2000-C (the "*Series 2000 Subordinated Obligations*"), and its Subordinated Revenue Bonds, Series 2001-A, 2001-B and 2001-C (the "*Series 2001 Subordinated Obligations*"), both of which were issued to finance the acquisition of the ParkEX facility. Funds on deposit in the separate accounts of the Improvement and Extension Fund held for the benefit of the Series 2000 Subordinated Obligations and the Series 2001 Subordinated Obligations are currently invested in two guaranteed investment contracts, which at their respective maturity dates are expected to provide for the $74.0 million aggregate principal payments of the Series 2000 Subordinated Obligations and the Series 2001 Subordinated Obligations at their respective maturities on December 31, 2030 and January 1, 2031.

On November 20, 2018, the Authority issued its Subordinated Obligations, Series 2018-A (AMT) (the "*Series 2018 Subordinated Obligations*," and together with the Series 2000 Subordinated Obligations and the Series 2001 Subordinated Obligations, the "*Subordinated Indebtedness*"), in the aggregate principal amount of up to $107.5

million, to provide bridge financing for the Commonwealth's portion of the costs of the design and construction of Berth 10 at Conley Terminal. As of June 30, 2019, approximately $40.0 million of the available amount of the Series 2018 Subordinated Obligations will have been drawn down by the Authority. See "PORT PROPERTIES – Maritime Properties – Conley Terminal," "CAPITAL PROGRAM – Authority Funded Capital Projects – Maritime Improvements" and "CAPITAL PROGRAM – Funding Sources – Commonwealth Funds." The Series 2018 Subordinated Obligations were sold in a private placement transaction to a bank lender, bear a variable rate of interest and mature on July 1, 2028. The Series 2018 Subordinated Obligations are subject to mandatory tender on July 1, 2023 (the "*Tender Date*"). If not repaid in full on the Tender Date, the remaining outstanding principal amount of the Series 2018 Subordinated Obligations must be repaid over a three year term in equal semi-annual principal installments, plus interest. Although the Authority expects to repay the principal of the Series 2018 Subordinated Obligations in full on or before July 1, 2022 from the Commonwealth's payments under the Conley Terminal MOU, the Series 2018 Subordinated Obligations are secured by the moneys on deposit in the Improvement and Extension Fund available for such purpose and by a pledge of the Authority's Revenues, subordinate to the pledge securing the Bonds, including the 2019 Bonds. In the event that the Commonwealth's payments under the Conley Terminal MOU are delayed or not made, and the Authority reaches agreement with the purchaser on or before the Tender Date, the Series 2018 Subordinated Obligations are also subject to sinking fund payments of the principal thereof on each July 1, commencing July 1, 2023 through July 1, 2028.

The Authority has not agreed to any additional covenants for the benefit of the bank lender in connection with the Series 2018 Subordinated Obligations that are not contained in the 1978 Trust Agreement.

The Subordinated Indebtedness is subordinate to the 2019 Bonds and all other outstanding Bonds issued under the 1978 Trust Agreement.

Commercial Paper

On May 15, 2012, the Authority renewed its commercial paper program in an aggregate principal amount not to exceed $100.0 million and entered into a three-year Letter of Credit and Reimbursement Agreement with TD Bank, N.A. ("*TDBank*"), to provide security for the commercial paper program. On March 4, 2014, the Authority amended the commercial paper program increasing the aggregate principal amount to up to $150.0 million and extending the expiration of the Letter of Credit and Reimbursement Agreement with TD Bank to June 1, 2017. On June 1, 2017, the expiration date of the Letter of Credit and Reimbursement Agreement with TD Bank was extended to June 1, 2022. As of June 30, 2019, the Authority had outstanding $104.0 million of commercial paper notes. The obligations of the Authority with respect to its commercial paper notes are secured by the Improvement and Extension Fund and the proceeds of Bonds subsequently issued for that purpose. While PFCs are not pledged to secure the Authority's commercial paper, the Authority currently expects to repay a significant portion of the notes from the PFC Capital Fund.

The Authority expects to repay and redeem $42.0 million of the existing commercial paper with the proceeds of the 2019-C Bonds; shortly thereafter the Authority expects to issue new commercial paper that will serve as bond anticipation notes, which are expected to be refinanced with proceeds of Bonds to be issued in the future.

DEBT ISSUANCE AND DEBT MANAGEMENT POLICY

In February 2010, the Authority initially adopted a Debt Issuance and Debt Management Policy ("*Debt Policy*"). The Debt Policy covers the types of debt that the Authority may issue; the legal, policy and financial limits that govern the issuance of debt; the use of derivatives; debt structuring practices; debt issuance practices; and debt management practices including compliance with tax law requirements, arbitrage regulations, investment of bond proceeds, disclosure and records retention. The policy requires the Members of the Authority to review and consider revisions to the policy every five years. Pursuant to the Debt Policy, projects that are funded with Bond proceeds should be central to the Authority's core mission; debt issuance practices should support the maintenance of the Authority's long term credit ratings; and Bond-funded projects must be included in the Authority's five-year capital program. Specific financial metrics, including those listed below, were established for the five-year capital program in support of these objectives.

	Debt Policy Goal
Annual Debt Service Coverage[1]	2.00x
Contribution Margin[2]	> or = 30%
Contribution Margin (Logan Airport)	> or = 30%
Operating Ratio[3]	< or = 70%
Days Cash on Hand[4]	> or = 250 days

[1] *Debt Service Coverage for the least robust year in the five-year period projections should not be below 1.75x.*
[2] *Contribution Margin: (operating revenues minus operating expenses and PILOT payments[5])/total operating revenues.*
[3] *Operating Ratio: (operating expense plus PILOT payments)/operating revenues.*
[4] *Days Cash on Hand: (cash plus unutilized commercial paper). Days Cash on Hand as of June 30, 2018 was 523 days.*
[5] *Annual PILOT payments for fiscal years 2019 through 2023 are forecast to be $20.9 million, $22.2 million, $22.6 million, $28.4 million and $29.3 million, respectively.*

The Members of the Authority most recently reviewed and re-adopted the Debt Policy in June 2018. Currently, the Authority has no outstanding Financial Hedges (as defined under "GENERAL OPERATIONAL FACTORS – Financial Hedge Policy").

AVIATION INDUSTRY CONSIDERATIONS

General Economic Conditions

Historically, the financial performance of the air transportation industry has correlated with the state of the national and global economy. Following significant and dramatic changes that occurred in the financial markets in September 2008, the U.S. economy experienced a recession followed by weak economic growth. More recently, the significant improvement in economic conditions in the U.S. has contributed to the rebound in aviation activity levels nationwide. It is not known at this time whether the improving national unemployment rate or the current rate of national and global economic growth will persist beyond 2019 and what effect, if any, they will have on the air transportation industry.

Financial Condition of the Airline Industry

The number of passengers using the Airport will depend partly on the profitability of the U.S. airline industry and the associated ability of the industry and individual airlines to make the necessary investments to continue providing service. The airline industry has historically been highly cyclical and has been characterized by intense competition, high operating and capital costs, and varying demand. Passenger and cargo volumes are highly sensitive to general and localized economic trends, and passenger traffic varies substantially with seasonal travel patterns. After an exceptional period of volatility in the 2000s, the outlook for U.S. carrier profitability in the near-term is positive, with the U.S. airline industry having posted its eighth consecutive year of profitability in 2018. This comes as U.S. carriers have continued to exercise significant capacity discipline in recent years by eliminating unprofitable routes and redundant services, reducing service at smaller hubs and in less profitable markets, beginning to grow operations strategically, often serving key hubs, and focusing on the use of right-sized aircraft to serve markets. In addition, an increase in fees for ancillary services, such as checked baggage, flight reservation and cancellation, early boarding, seat selection and food service has also helped to increase revenues. After seven years of profitable operations by the major U.S. airlines, there is cautious optimism that the U.S. airline industry has moved to a cycle of sustainable profits, but the profitability of the airline industry, nonetheless, may still fluctuate dramatically from quarter to quarter and from year to year, even in the absence of catastrophic events such as the terrorist attacks of September 11, 2001 and the economic recession of 2008 and 2009.

Further, because of the discretionary nature of business and personal travel spending, airline passenger traffic and revenues are heavily influenced by a variety of factors, including: (i) the strength of the U.S. economy and other regional and world economies, (ii) the cost and availability of labor, fuel, aircraft and insurance, (iii) international trade, (iv) currency values, (v) competitive or partnership considerations, including the effects of airline ticket pricing, (vi) traffic and airport capacity constraints, (vii) governmental regulation, including security regulations and taxes imposed on airlines and passengers, evolving federal restrictions on travel to the United States from certain countries, and maintenance and environmental requirements, (viii) passenger demand for air travel, including the availability of business travel substitutes such as teleconferencing, videoconferencing and web-casting, (ix) strikes and other union activities, (x) disruptions caused by airline accidents, criminal incidents, acts of war or terrorism, outbreaks of disease and weather and natural disasters and (xi) disruptions caused by government policies or actions, such as a federal government shutdown.

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

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

Airline Consolidation

In 2005, ten major airlines were flying inside the United States (AirTran, Alaska, American, America West, Continental, Delta, Northwest, Southwest, United and US Airways) and accounted for 87.0% of all available seats. Faced with declining profitability due to the increased cost of aviation fuel, lower fares brought on by the proliferation of low cost carriers (as described below), reduced growth potential in the domestic markets and declining passenger activity based on security concerns, the airlines pursued consolidation. As a result of these consolidations, today there are four major airlines flying inside the United States (American, Delta, Southwest and United) that account for approximately 80% of domestic capacity (available seats). Most recently, in December 2016, Alaska acquired Virgin America, and a single operating certificate was issued in 2018. Such consolidation, combined with a focus on driving profitability via capacity discipline and unbundling of services and resulting increased fee income, has increased airline profitability. Airline analysts expect the consolidated entities will continue to remain profitable in the near-term with a continued focus on return on invested capital through capacity discipline.

Further airline consolidation remains possible. Depending on which airlines serving the Airport, if any, merge or join alliances, the result may be fewer flights or decreases in gate utilization by one or more airlines. Such decreases could result in reduced Airport revenues, reduced PFC collections and increased costs for the airlines serving the Airport. For the reasons stated in APPENDIX C to the Official Statement, the Authority believes that the Airport is at a relatively low risk of losing passenger traffic due to further mergers, consolidations or liquidations, beyond some short-term disruption, because of the underlying strengths of the Boston market. See APPENDIX C – Boston Logan International Airport Market Analysis.

Growth of Low Cost Carriers

Low cost carriers ("*LCCs*") are carriers that take advantage of an operating cost structure that is typically significantly lower than the cost structure of the network carriers and an increased reliance on fee revenues. These advantages can include lower labor costs, greater labor flexibility, a streamlined aircraft fleet (i.e., fewer different types of aircraft in a given airline's fleet) and a generally more efficient operation. These low costs suggest that the LCCs can offer a lower fare structure to the traveling public than network carriers while still maintaining profitability. Further, increased access to major markets for LCCs may moderate average airfare increases that can typically result from airline consolidation. In calendar year 2018, LCCs provided approximately 30% of the airline seat capacity in the U.S. market.

As the larger U.S. carriers consolidated and became more focused on capacity discipline, fare increases took hold. LCCs began to emerge in larger markets where passenger levels were high enough for the LCCs to overcome certain barriers to entry caused by the larger carriers such as, for example, control of the majority of airport gates and slots. The cost structure of LCCs allows for lower fares, which has stimulated traffic and driven LCCs into more and larger markets. One result of the consolidation of carriers and their capacity discipline and the associated fare increases is that certain price-sensitive travelers are flying less. Recently, these budget conscious flyers have emerged as an underserved segment which has helped to expand the LCC market to include the ultra-low cost carriers ("*ULCCs*"), such as Allegiant, Frontier and Spirit. The ULCC business model is characterized by extreme unbundling of services; the purchase of a ticket on a ULCC covers only the seat. Other amenities such as seat choice, food or drink, checked or carry-on luggage or a paper boarding pass are then available for additional a la carte purchase.

LCCs and ULCCs have significantly increased their service at the Airport. Five domestic LCCs and ULCCs currently operate at the Airport—JetBlue, Southwest, Spirit Airlines, Sun Country and Frontier Airlines. These airlines collectively lease (either directly from the Authority or through sublease arrangements with other carriers) 31 gates at the Airport. As mentioned under "AIRPORT PROPERTIES – Boston-Logan International Airport – Airline Passenger Services" herein, JetBlue has grown to become the largest carrier at the Airport with a market share of 27.9% in fiscal year 2018. In addition to these domestic LCCs, four foreign flag LCCs—Level, Norwegian (includes Air Shuttle and UK), Porter and WestJet—provide international service to six destinations. The foreign flag LCCs use the common use gates in Terminal E with the exception of WestJet, which subleases a gate in Terminal A from Delta. Low cost carriers account for 41.5% of Airport-wide scheduled departing seats in fiscal year 2019.

To some extent, the distinction between LCCs and the major network airlines has blurred in recent years. As the LCCs have started to serve airports in major metropolitan areas (such as JetBlue at Logan, New York-JFK and New York-LaGuardia and Southwest at Logan and New York-LaGuardia) in an effort to capture business travelers, and some LCCs have faced increases in labor costs (e.g., the JetBlue pilots unionized in April 2014), the cost base of the traditional LCC has trended upwards. In the twelve months ended September 30, 2018 (the most recent data available), Southwest and JetBlue had an average unit cost of 11.6 cents, which was just below that of Hawaiian Airlines (at 12.4 cents). At the same time, the major network carriers have been adopting some of the practices and operational norms of the LCCs, resulting in a general downtrend for major network airline costs. As a result, the fare differential between LCCs and network carriers has narrowed in recent years.

Structural Changes in the Travel Market

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

Effect of Bankruptcy of Air Carriers

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

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

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

Cost of Aviation Fuel

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

There has been no shortage of aviation fuel since the "fuel crisis" of 1974, but there have been significant price increases for fuel. From 2000 to 2008, the price of aviation fuel more than tripled. Oil prices reached an all-time record high of approximately $145 per barrel in July 2008, and while they have declined from this elevated level, they have fluctuated significantly since then. During the second half of calendar year 2014, an imbalance between worldwide supply and demand resulted in a significant drop in the price of oil and aviation fuel. As of May 1 2019, according to Bloomberg, oil prices were at $61 per barrel. According to Form 41 (US DOT), for calendar year 2017 fuel expenses were approximately 23.0% of U.S. passenger airline operating costs. Historically, significant fluctuations and prolonged increases in the cost of aviation fuel have adversely affected air transportation industry profitability, causing airlines to reduce capacity, fleet and personnel, to invest in new, more fuel efficient aircraft and equipment and to increase airfares and institute fuel, checked baggage, and other extra surcharges, all of which may reduce demand for air travel.

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

Aviation Security, Health and Safety Concerns

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

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

Public health and safety concerns have also affected air travel demand from time to time. In 2003, concerns about the spread of severe acute respiratory syndrome (SARS) led public health agencies to issue advisories against nonessential travel to certain regions of the world. In 2009, while the United States Centers for Disease Control and Prevention ("*CDC*") and the World Health Organization ("*WHO*") did not recommend that people avoid domestic or international travel, concerns about the spread of influenza caused by the H1N1 virus reduced international air travel, particularly to and from Mexico and Asia. In 2014, an outbreak of Ebola in West Africa and the discovery of a patient and health care workers infected with Ebola in the United States raised concerns about the spread of communicable disease through air travel. More recently, in January 2016, the CDC issued a travel alert warning pregnant women to avoid travel to areas where the Zika virus, which has been linked to a type of birth defect called microcephaly, is spreading, a list that currently includes over 90 countries and territories, primarily in Africa, Asia, the Caribbean, Central America, South America and certain Pacific Islands, but also including certain portions of the United States.

Following the fatal crashes of two Boeing 737 MAX aircraft that are suspected to have been caused by the malfunction of the aircraft's automated flight control system, all Boeing 737 MAX aircraft were grounded in March 2019. Among North American airlines, Air Canada, American, Southwest and United are being affected. At the time of the grounding, Boeing 737 MAX aircraft accounted for approximately 1.5% of U.S. airline seat capacity. It is expected that the grounding will last several months while the flight control system software is updated and approved by the FAA, and pilot training is completed. It is unclear what impact, if any, this grounding will have on passenger travel behavior and air travel demand.

Information Concerning the Airlines

Many of the principal domestic airlines serving the Airport, or their respective parent corporations, are subject to the information reporting requirements of the Securities Exchange Act of 1934, as amended, and in accordance therewith file reports and other information with the SEC. Likewise, foreign airlines serving the Airport that have American Depository Receipts ("*ADRs*") registered on a U.S. national exchange are subject to the same reporting requirements. Certain information, including financial information, concerning such domestic airlines, or their respective parent corporations, and such foreign airlines is disclosed in certain reports and statements filed with the SEC. Such reports and statements can be inspected and copied at the public reference facilities maintained by the SEC and on its website.

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

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

Forward-Looking Statements

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

As discussed in the Airport Market Analysis attached as APPENDIX C and the Review of Revenue Forecasts attached as APPENDIX D, the factors affecting aviation activity at the Airport include: the growth of population and of the economy in the Boston Primary and Secondary Market Service Area, airline service and route networks, the financial health and viability of the airline industry, national and international economic and political conditions, the availability and price of aviation fuel, levels of air fares, the capacity of the national air traffic control system and capacity at the Airport and elsewhere. See APPENDIX C – Boston Logan International Airport Market Analysis and APPENDIX D – Review of Airport Properties Net Revenues Forecasts. Each of these reports should be read in its entirety for an understanding of all of the assumptions used to prepare the respective forecasts made therein. No assurances can be given that these or any of the other assumptions contained in the Airport Market Analysis or the Review of Revenue Forecasts will materialize. Inevitably, some assumptions used to develop the forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, the actual results achieved during the forecast period will vary, and the variations may be material. See "MARKET ANALYSIS AND REVIEW OF AIRPORT NET REVENUES" and "MANAGEMENT'S DISCUSSION OF FORECAST ASSUMPTIONS" herein and APPENDIX C – Boston Logan International Airport Market Analysis hereto and APPENDIX D – Review of Airport Properties Net Revenues Forecasts to the Official Statement relating to the 2019 Bonds.

Federal Law Affecting Airport Rates and Charges

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

In 1997, the United States Court of Appeals for the District of Columbia Circuit vacated the Rates and Charges Policy in part, determined that a portion of the Rates and Charges Policy was arbitrary and capricious and remanded it to the USDOT. In 2008, USDOT amended the Rates and Charges Policy to permit "congested airports," as defined therein, to charge a two part landing fee that includes a per operation charge intended to help reduce congestion and operating delays. Congested airports are also permitted to include certain other costs in their rate base, including the cost of certain construction in progress and costs associated with reliever airports, if owned by the same airport operator. The Airport does not currently qualify as a "congested airport." The USDOT has not yet proposed any other revisions to the Rates and Charges Policy. If new guidelines are published, the costs that will be permitted to be included in determining an airport's rate base and the extent to which such future guidelines may limit the Authority's flexibility in negotiating new airline agreements or in setting rates and charges for use of the Airport's airfield and non-airfield facilities cannot be determined at this time. Any new FAA guidelines or any standards promulgated by a court in connection with a dispute could limit the amounts and allocation of costs payable by airlines serving the Airport. Until the USDOT promulgates a new policy regarding rates and charges, the guiding principle for determining whether rates and charges established for use of airport assets is the requirement of federal law that such charges be "reasonable."

The Authority is not aware of any formal dispute involving the Airport over any existing rates and charges, including the rates and charges for fiscal year 2019. The Authority believes that the rates and charges methodology utilized by the Authority and the rates and charges imposed by it upon air carriers, foreign air carriers and other aeronautical users operating at the Airport Properties are reasonable and consistent with applicable law. However, there can be no assurance that a complaint will not be brought against the Authority in the near-term with respect to the fiscal year 2019 rates and charges, or in the future, challenging such methodology and the rates and charges established by the Authority and, if a judgment is rendered against the Authority, there can be no assurance that rates and charges paid by aeronautical users of the Airport will not be reduced. See "AUTHORITY REVENUES – Airport Properties Revenues."

Considerations Regarding Other Sources of Revenue

Passenger Facility Charges. Under the PFC Act, the FAA may authorize a public agency to impose a PFC of up to \$4.50 on each eligible passenger of an air carrier enplaned at any commercial service airport controlled by the public agency, subject to certain limitations. PFCs are available to airports to finance certain projects that (i) preserve or enhance capacity, safety or security of the national air transportation system, (ii) reduce noise resulting from an airport, or (iii) furnish opportunities for enhanced competition among air carriers. Under certain circumstances, the FAA grants approval to commence collection of PFCs ("impose only" approval) before approval to spend the PFCs on approved projects ("use" approval) is granted. Approval to both collect and spend PFCs is referred to as an "impose and use" approval.

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

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

In fiscal years 2011 through 2015, the Authority was awarded TSA Other Transaction Agreement ("*OTA*") grant funding for the Checked Baggage Inspection System ("*CBIS*") in the amount of \$120.9 million, and through fiscal year 2018, the Authority collected the \$120.9 million for the CBIS and the OTA was closed in August 2017. No assurance can be given that federal grants-in-aid will actually be received in the amount or at the time contemplated by the Authority.

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

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

FAA Reauthorization and Level of Federal Airport Grant Funding. On October 5, 2018, the President signed into law a five-year reauthorization bill for the FAA—the FAA Reauthorization Act of 2018. The 2018 FAA reauthorization retains the federal cap on PFCs at $4.50 and authorizes $3.35 billion per year for AIP through federal fiscal year 2023, which is the same funding level as was in place for the preceding five years. The AIP provides federal capital grants to support airport infrastructure through entitlement grants (determined by formulas based on passenger, cargo and general aviation activity levels) and discretionary grants (allocated on the basis of specific set-asides and the national priority ranking system). The Authority is unable to predict the level of AIP funding at this time, since authorization is subject to Congressional appropriation. If there is a reduction in the amount of AIP grants awarded to the Authority for the Airport, it could: (1) increase by a corresponding amount the capital expenditures that the Authority would need to fund from other sources (including operating revenues, and Bond proceeds), (2) extend the timing to complete certain projects, or (3) reduce the scope of individual proposed projects or the overall program, or both. See "CAPITAL PROGRAM – Funding Sources – Federal Grants" for more information regarding federal grant funding received by the Authority.

Cybersecurity

The Authority, like many other large public and private entities, relies on a large and complex technology environment to conduct its operations, and faces multiple cybersecurity threats including, but not limited to, hacking, phishing, viruses, malware, ransomware and other attacks to its computing and other digital networks and systems (collectively, "*Systems Technology*"). As a recipient and provider of personal, private or sensitive information, the Authority may be the target of cybersecurity incidents that could result in adverse consequences to the Authority's Systems Technology, requiring a response action to mitigate the consequences.

Cybersecurity incidents could result from unintentional events, or from deliberate attacks by unauthorized entities or individuals attempting to gain access to the Authority's Systems Technology for the purposes of misappropriating assets or information or causing operational disruption or damage. To mitigate the risk of business operations impact and/or damage by cybersecurity incidents or cyber-attacks, the Authority invests in multiple forms of cybersecurity and operational safeguards.

While the Authority's cybersecurity and operational safeguards are periodically tested, no assurance can be given by the Authority that such measures will ensure against other cybersecurity threats and attacks. Cybersecurity breaches could damage the Authority's Systems Technology and cause material disruptions to the Authority's finances or operations. The costs of remedying any such damage or protecting against future attacks could be substantial.

The airlines serving the Airport and other Airport tenants, as well as the FAA and TSA, also face cybersecurity threats that could affect their operations or finances.

Environmental Regulations

The FAA has jurisdiction over certain environmental matters, including soundproofing. Airport noise is a significant federal and local issue, which may require substantial capital investments by the industry and/or airport operators, including the Authority, from time to time to meet applicable standards. The Authority implemented an extensive soundproofing program in 1984, which remains ongoing. As of May 2019, the Authority has invested over $172.0 million through this program to treat 36 local schools and more than 11,500 dwelling units. See "GENERAL OPERATIONAL FACTORS – Local Impact Considerations."

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

Climate Change

Numerous scientific studies on global climate change show that, among other effects on the global ecosystem, sea levels will rise, extreme temperatures will become more common and extreme weather events will become more frequent as a result of increasing global temperatures attributable to atmospheric pollution.

The Fourth National Climate Assessment, published by the U.S. Global Change Research Program in November 2018 ("*NCA4*"), finds that more frequent and intense extreme weather and climate-related events, as well as changes in average climate conditions, are expected to continue to damage infrastructure, ecosystems and social systems over the next 25 to 100 years. NCA4 states that rising temperatures, sea level rise, and changes in extreme events are expected to increasingly disrupt and damage critical infrastructure and property and regional economies and industries that depend on natural resources and favorable climate conditions. Disruptions could include more frequent and longer-lasting power outages, fuel shortages and service disruptions. NCA4 states that the continued increase in the frequency and extent of high-tide flooding due to sea level rise threatens coastal public infrastructure. NCA4 also states that expected increases in the severity and frequency of heavy precipitation events will affect inland infrastructure, including access to roads, the viability of bridges and the safety of pipelines. NCA4 finds that coastal airports are vulnerable to effects of sea level rise, with flooding potentially exacerbated by storm surges and high tides.

Adapting to sea level rise and planning for potential flooding due to the Airport's coastal location is a key component of the Authority's policies. See "GENERAL OPERATIONAL FACTORS – Massport Resiliency Program" for a discussion of the Authority's resiliency program, which was one of the first in the nation for airports.

Projections of the effects of global climate change on the City of Boston, Logan Airport, airline users of the Airport, the Port of Boston, and on operations at the Airport and the Port are complex and depend on many factors that are outside the Authority's control. Climate change may affect Logan operations directly, as discussed above, or indirectly, such as by disrupting operations at other airports that have ripple effects in the air transportation system. The various scientific studies that forecast climate change and its adverse effects, including sea level rise and flooding risk, are based on assumptions contained in such studies, but actual events may vary materially. Also, the scientific understanding of climate change and its effects continues to evolve. Accordingly, the Authority is unable to forecast when sea level rise or other adverse effects of climate change will occur. In particular, the Authority cannot predict the timing or precise magnitude of adverse economic effects, including, without limitation, material adverse effects on the business operations or financial condition of the Airport, the Port and the local economy during the term of the 2019 Bonds. While the effects of climate change may be mitigated by the Authority's past and future investment in adaptation strategies, the Authority cannot give any assurance about the net effects of those strategies and whether the Authority will be required to take additional adaptive mitigation measures. If necessary, such additional measures could require significant capital resources.

Technological Innovations in Ground Transportation

One significant source of non-airline revenues is generated from ground transportation activity, including use of on-Airport parking facilities; trip fees paid by taxis, limousines and TNCs; and rental car transactions by Airport passengers. While passenger levels are increasing, the relative market share of these sources of revenue is shifting. As one example, the popularity of TNCs has increased because of the increasing number of cities where TNCs operate, the convenience of requesting a ride through a mobile application, the ability to pay for this service without providing cash or other payment to the hired driver, and competitive pricing. In accordance with state law, the Authority entered into operating agreements with TNCs Uber USA and Raiser LLC, both part of Uber Technologies, Inc. ("*Uber*"), and Lyft, Inc. ("*Lyft*"), in February 2017. Pursuant to their respective operating agreements, TNCs are now permitted to pick up passengers at the Airport, with a per-pick up fee being paid to the Authority.

In fiscal year 2018 (the first full year of authorized TNC operations at the Airport), TNCs recorded almost 2.5 million pickups. The Authority actively monitors all modes of ground transportation to assess trends, which include potential impacts from TNCs. Based on activity to date, the Authority believes TNCs are impacting three primary ground transportation modes to varying degrees:

- **Taxi/Limo/Livery.** The TNCs have had the most significant impact on similar, commercial for-hire modes such as Taxi/Limo/Livery. Historically, the mode share of Taxi/Limo/Livery represented approximately 35% of total ground access to the Airport. Since the introduction of TNCs to the Airport, the total mode share of similar, commercial for-hire modes has reached 38%, with TNCs accounting for 25% of total mode share.

- **Commercial Parking operation.** TNC activity to date may be adversely impacting the Airport's parking operation, where the Authority has seen a reduction of exits, primarily limited to short-term parking, over the past year that could be attributed to the introduction of TNCs at Logan.

- **Non-commercial pick-up/drop-offs.** This mode is defined as the pick-up and or drop-off of passengers by a family member or friend at Logan Airport. The Authority's tracks this mode of transportation indirectly through its roadway traffic counting system. Over the past year, the Authority has seen a slight reduction in this mode of transportation, which could be attributed to the introduction of TNCs.

Despite these shifts, the Airport's ground transportation revenue has continued to increase in fiscal year 2018 compared to fiscal year 2017.

The popularity of TNCs has increased because of convenience of requesting a ride and competitive pricing. TNCs conducted over 2.4 million pickups at the Airport in fiscal year 2019 (through March 31, 2019), and now account for approximately 26% of the trips on-Airport. To address the significant increase in TNC volume, the Authority expects to invest approximately $15.0 million to retrofit an area of the Central Garage that will create a new, dedicated TNC curb and co-locate pick-up and drop-off operations. The Authority actively monitors all modes of ground transportation to assess trends, which include potential impacts from TNCs. While many airports nationwide initially expressed concerns regarding the impacts of TNCs on other revenues, such as parking, the Authority has found the impact of TNCs since they began pick-up operations at the Airport in February 2017 to be generally positive in terms of ground transportation revenues.

The TNC fee is greater than that for most modes that their operations have displaced, resulting in strong overall revenue collections with an increase over those in fiscal year 2018. In addition to the $3.25 pick-up fee the Authority currently levies on TNCs picking up passengers at the Airport, the Authority plans to add a drop-off fee of $3.25 starting no earlier than October 1, 2019. Compared to total Revenue collected from TNCs through March 31, 2019 and budgeted collections for the remaining three months of fiscal year 2019, the planned additional fee is expected to produce an additional $6.6 million in Revenue in fiscal year 2020 (reflecting partial year impact) and $10.3 million in Revenue in fiscal year 2021 (reflecting full year impact), which the Authority expects will be used to fund the new TNC operation and HOV initiatives.

In addition to TNCs, new technologies (such as autonomous vehicles and connected vehicles) and innovative business strategies in established markets such as commercial ground transportation and car rental may continue to occur and may result in further changes in Airport passengers' choice of ground transportation mode. While the Authority makes every effort to anticipate demand shifts, there may be times when the Authority's expectations differ from actual outcomes. In such event, revenue from one of more ground transportation modes may be lower than expected. The Authority cannot predict with certainty what impact these innovations in ground transportation will have over time on revenues from parking, other ground transportation services or rental cars. The Authority also cannot predict with certainty whether or to what extent it will collect non-airline revenues in connection with such new technologies or innovative business strategies.

GENERAL OPERATIONAL FACTORS

Personnel Considerations

Labor. As of March 31, 2019, the Authority had 1,288 full-time employees. In addition, the Authority had 23 regular part-time and job share employees. There are nine bargaining units, each with separate collective bargaining agreements between the Authority and the eight unions representing these units, which represent a total of

703 of these full-time employees and 11 of these part-time employees. Of these nine collective bargaining agreements, one expired on January 31, 2019, one expired on May 5, 2019, four expire on June 30, 2019, two expire on June 30, 2021, and one expires on October 5, 2021. The Authority is currently in negotiations for the two agreements that expired on January 31, 2019 and the agreement that expired on May 5, 2019. The Authority anticipates being in negotiations for successor agreements for the other contracts that expire in 2019 between the spring and summer of 2019. In general, upon the expiration of a collective bargaining agreement, the Authority's practice is to continue honoring the terms of such agreement until a new agreement takes effect. The Authority seeks to control its labor costs to the most prudent extent possible and, accordingly, none of its labor agreements provides for an automatic cost-of-living escalator. The Authority considers its relations with its employees and their union representatives to be good.

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

Approximately 326 members of the International Longshoremen's Association Locals 799, 800, 805, 1604 and 1066 (the "*ILA*"), the members of which are not Authority employees, work at Conley Terminal and Flynn Cruiseport Boston on either a full time or casual basis. The Authority, along with various stevedoring companies, shipping lines and terminal operators, constitute the Boston Shipping Association ("*BSA*"), which is a multi-employer association responsible for the negotiation and administration of collective bargaining agreements with the ILA. Decisions by the BSA on matters concerning negotiations and administration of collective bargaining agreements are binding on member employers. The current collective bargaining agreements between the BSA and the ILA will expire on September 30, 2024.

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

Non-Discrimination, Equal Opportunity and Affirmative Action. The Authority does not discriminate against any person, employee or applicant for employment because of the person's membership in any legally protected class, including, but not limited to, that person's race, color, gender, religion, creed, national origin, ancestry, age (40 years and over), sexual orientation, pregnancy, citizenship, gender identity, handicap, disability, genetic information, or veteran status. The Authority does not discriminate against any person, employee, or applicant for employment who is a member of, or applies to perform service in, or has an obligation to perform service in, a uniformed military service of the United States, including the National Guard, on the basis of that membership, application, or obligation. The Authority is committed, in accordance with applicable law, to affirmative action in its hiring of minorities, women, persons with disabilities and veterans in order to attract and retain a diverse workforce.

The Authority is committed to equality of economic opportunity and, in accordance with applicable law, encourages and supports the inclusion of minority-owned business enterprises ("*MBEs*"), women-owned business enterprises ("*WBEs*"), disadvantaged business enterprises ("*DBEs*"), and airport concessions disadvantaged business enterprises ("*ACDBEs*") in its contracting and procurement opportunities including concessions, construction and design, and goods and services.

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

Environmental and Regulatory Considerations

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

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

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

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

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

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

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

Local Impact Considerations

The location of the Airport, bounded by residential neighborhoods and mixed residential and commercial areas, as well as wetland and open water habitats, necessitates that Airport development and operations be undertaken with sensitivity to environmental factors. The FAA's implementation of next generation flight procedures and technology has concentrated aircraft noise over a narrower band of properties. This has resulted in increased complaints from communities under these concentrated paths near Logan Airport and at other communities nationwide. To address this issue, the Authority has entered into a Memorandum of Understanding (the "*MOU*") with the FAA. The MOU provides for the establishment of a technical team led by the Massachusetts Institute of Technology to study and offer potential solutions to the aircraft noise concentration issue. This work is underway and expected to be completed in summer 2019.

Logan's location as an urban airport and the impact of aircraft operations on nearby communities has led to the development of noise abatement programs by the Authority consistent with maintaining high quality air service for the New England area. The programs include soundproofing of eligible homes, a computer-based program to monitor overall noise impact, noise abatement ground procedures, noise restrictions on certain runway ends, noise abatement turns on certain departure procedures, late night runway preference, and advocating for single engine taxiing when appropriate. The Authority does not believe these programs have had, or are likely to have, a material effect on Airport Revenues.

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

Massport Resiliency Program

The Airport's location directly adjacent to Boston Harbor also requires that the Authority carefully review and prepare for future changes in climate and its potential impact on Airport operations. To that end, in 2014, the Authority began the Massport Resiliency Program (the "*MRP*")—one of the first in the nation for airports—to protect the Authority's transportation facilities from flooding hazards caused by extreme storms and rising sea levels as a result of climate change. This comprehensive resiliency program is not only designed to protect the Authority's most important critical facilities, but also enables the Authority to serve the greater community by helping to ensure such facilities remain operational to serve as a resource for relief, transit and communication efforts, as necessary, in the case of a major storm or weather incident. Resiliency is the ability of a system to withstand a major disruption within acceptable degradation parameters, to recover within an acceptable time, and to prioritize projects by considering the likelihood of damage versus hardening costs. The Authority reviews and updates the MRP regularly.

Recent examples of the Authority's resiliency efforts include: creating a flood proofing Design Guide to assist designers, architects and planners engaged in building new or retrofitting existing infrastructure at Authority facilities to ensure such infrastructure is flood proof; developing Flood Operations Plans for the Airport and maritime facilities that detail the steps to help prevent and recover from any flood-related event; sealing and installing flood doors and fencing for electrical infrastructure like substations and transformers to prevent flooding; and establishing temporary flood barriers that can be deployed in the event of a flood-related emergency for the State Police building at Logan Airport, in addition to other locations.

Financial Considerations

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

As of December 31, 2017, the Authority's actuarial accrued liability ("*AAL*") totaled approximately \$671.4 million, and the actuarial value of Plan assets available for Plan benefits was approximately \$623.4 million. In accordance with GASB 68, as of December 31, 2017, the Authority's total pension liability was approximately \$683.5 million and the Plan's fiduciary net position was approximately \$648.6 million, resulting in a net pension liability of \$34.9 million, as compared to \$88.3 million as of December 31, 2016. The Authority's pension expense in fiscal year 2018 was approximately \$8.8 million, as compared to approximately \$19.7 million for fiscal year 2017. The decrease was primarily due to favorable investment returns. See Note 6 and the Required Supplementary Information to the Financial Statements in APPENDIX B to the Official Statement for additional information regarding the Plan.

Other Post-Retirement Employee Benefits. The Authority extends other post-employment benefits ("*OPEB*") to its employees as provided under the Enabling Act and Chapter 32A of the Massachusetts General Laws. In June 2008, the Authority established an irrevocable trust (an "*OPEB Trust*") to partially fund the projected accrued liability for other post-employment benefits. Prior to the establishment of the OPEB Trust, the Authority funded other post-employment benefits exclusively on a pay-as-you-go basis. As of the January 1, 2018 valuation (the most recent one available), the Authority's AAL for OPEB was approximately $308.3 million, and the actuarial value of assets held by the OPEB Trust was $202.7 million or 65.7% of this AAL, resulting in an unfunded AAL of approximately $105.6 million, as compared to approximately $142.7 million as of the prior year.

In June 2015, GASB issued Statement No. 75, Accounting and Financial Reporting for Postemployment Benefit Other Than Pensions ("*GASB 75*") which sets forth new standards that modify the accounting and financial reporting of the Authority's OPEB obligations, effective June 30, 2018. The Authority adopted GASB 75 on June 30, 2018. This Statement requires governments, similar to the Authority, that participate in defined benefit OPEB plans to report a net OPEB liability or asset in their statement of net position. The net OPEB liability or asset is the difference between the total OPEB liability (the present value of projected benefit payments) and the assets (mostly investments reported at fair value) set aside in a trust and restricted to paying OPEB benefits to current employees, retirees and their beneficiaries. Additionally, the standard requires immediate recognition of annual service cost and interest on the OPEB liability and immediate recognition of the effect on the net OPEB liability of changes in benefit terms. Other components of OPEB expense will be recognized over a closed period that is determined by the average remaining service period of the plan members (both current and former employees, including retirees). These other components include the effects on the net OPEB liability of (a) changes in the economic and demographic assumptions used to project benefits and (b) differences between those assumptions and actual experience. Lastly, the effects on the net OPEB liability of differences between expected and actual investment returns will be recognized in OPEB expense over a closed five year period.

The Authority's OPEB Funding Policy, which establishes a methodology for funding benefits obligations accruing under the Massport Retiree Benefits Trust, was approved by the Retirement Board in June 2018. It is anticipated that current assets plus future assets from employer contributions and investment application and earnings should be sufficient to fund Massport Retiree Benefits Trust benefits. The OPEB Funding Policy is intended to reflect a reasonable, conservative approach for Authority financing, to the greatest extent possible, the cost of post-employment benefits earned and being accrued. This OPEB Funding Policy recognizes that there will be investment marketplace volatility and that actual economic and demographic experience will differ from assumed experience. Accordingly, the OPEB Funding Policy is intended to provide flexibility to address such volatility and experience in a reasonable, systematic, and actuarially and financially sound manner.

The Authority's OPEB expense in fiscal year 2018 is approximately $20.2 million, as compared to approximately $19.2 million for fiscal year 2017. See Note 7 and the Required Supplementary Information to the Financial Statements in APPENDIX B to the Official Statement for additional information regarding the Authority's OPEB obligations.

Payments in Lieu of Taxes. The Enabling Act and the 1978 Trust Agreement authorize and direct the Authority, subject to certain standards and limitations, to enter into agreements to make annual payments in lieu of taxes to the City of Boston and the Town of Winthrop. The Enabling Act, the 1978 Trust Agreement and the payment in lieu of tax agreements provide that the payments under these agreements for any fiscal year may not exceed the balance of revenues remaining for such fiscal year after payment of debt service and required reserve account deposits on outstanding Bonds, payment of operating expenses and payment of required deposits to the Maintenance Reserve Fund. See Note 10 to the Financial Statements in APPENDIX B to the Official Statement.

Pursuant to the terms of the amended payment in-lieu-of-taxes agreement between the Authority and the City of Boston (the "*Boston PILOT Agreement*"), the Boston PILOT Agreement terminates on June 30, 2022; provided, however, that absent an annual election by either party to terminate the Boston PILOT Agreement, the term is subject to automatic one-year extensions of the term on each July 1. In November 2016, the City of Boston notified the Authority of its election to terminate the Boston PILOT Agreement on June 30, 2022, and the parties expect to commence negotiations on a successor agreement or an amendment to the existing agreement. The Boston PILOT Agreement provides for the Authority to pay an annual base amount that increases annually by the annual percentage change in the consumer price index, provided that such increase shall be no less than 2.0%, nor greater than 8.0%, per year. Pursuant to the Boston PILOT Agreement, the Authority made annual payments of $17.9 million and $18.2 million in fiscal years 2017 and 2018, respectively, and expects to make an annual payment of $18.6 million in fiscal year 2019.

In fiscal year 2006, the Authority and the Town of Winthrop entered into an Amended and Restated Payment-In-Lieu-Of-Taxes Agreement (the "*Winthrop PILOT Agreement*"), which extended the base in-lieu-of-tax payments through fiscal year 2025. Pursuant to the Winthrop PILOT Agreement, the Authority made annual payments of $900,000 in fiscal years 2017 and 2018, respectively. The Winthrop PILOT Agreement was amended in November 2018, and pursuant thereto the Authority expects to make adjusted annual payments for the remainder of the term, commencing with a payment of $1.35 million in fiscal year 2019 and increasing annually to $2.0 million by fiscal year 2025.

Risk Management

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

The Authority's risk management program is designed to provide an appropriate level of protection against catastrophic loss, including direct damage to its projects, loss of revenue and third party legal liability obligations. The program utilizes a combination of purchased insurance and the Self-Insurance Account to provide this level of protection. The principal areas of risk exposure covered by self-insurance are insurance policy deductibles, environmental pollution, directors' and officers' liability, cyber liability and unknown risks.

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

The Authority maintains a Self-Insurance Account to cover all areas of self- insurance. See APPENDIX D to the Official Statement – Summary of Certain Provisions of the 1978 Trust Agreement – Insurance. As of March 31, 2019, the balance in the Self-Insurance Account was $32.5 million. Annual contributions, consistent with the recommendations of the Authority's Risk Management Consultant, are made to this account as part of the Authority's annual budget process. Losses within the self-insurance area are administered by Authority personnel, use of outside adjusters on a case specific basis and a third-party administrator for workers' compensation losses. The Authority's most recent annual Risk Management Assessment Report states that the extent of the Authority's funding of future liabilities within the Self Insurance Account represents what the Authority's Insurance Consultant considers to be a "best practice" among complex public agencies. Workers' compensation losses and losses within the retained layer are predictable and level over time which makes this an appropriate area for risk retention. The report also notes that the combination of internal administration and third-party administration of self-insured claims is sound and cites a demonstrated reduction in loss adjustment expenses, particularly, in the general liability and workers' compensation areas.

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

Investment Policy

All investments of Authority funds are made in accordance with the provisions of the 1978 Trust Agreement, the PFC Depositary Agreement or the CFC Trust Agreement and the investment policy adopted in 2000 (and most recently updated in June 2018) by the Authority (the "*Investment Policy*"). The goals of the Investment Policy, in order of importance, are: (1) to preserve capital, (2) to provide liquidity to meet payment obligations, and (3) to generate investment income. As authorized by the Investment Policy, the Investment Oversight Committee, chaired by the Director of Administration and Finance of the Authority, oversees the Authority's investments. The Investment Oversight Committee has established diversification requirements for its investments. The Investment Oversight Committee meets quarterly and determines the general strategies for investment activities and monitors investment results against external benchmarks.

Financial Hedge Policy

In October 2004, the Members of the Authority approved a formal Financial Hedging Policy, which provides general guidelines regarding the use, procurement and execution of all interest rate swaps, options, caps, collars and related financial transactions ("*Financial Hedges*") by the Authority. The Financial Hedging Policy was most recently revised and reauthorized by the Members of the Authority in June 2018. No Financial Hedge may be executed without the approval of the Members of the Authority and review by the State Finance and Governance Board. Prior to seeking the approval of the Authority of any proposed Financial Hedge, the Investment Oversight Committee must undertake an identification and evaluation of the financial benefits and risks involved in the Financial Hedge transaction, including certain enumerated risks, and summarize them for the Members of the Authority. Financial Hedges may not be entered into for speculative purposes, where the Authority does not have sufficient liquidity to terminate an existing Financial Hedge at current market values, or where there is insufficient price transparency to permit reasonable valuation of the Financial Hedge. Counterparty exposure may not exceed prudent limits, and only entities rated "A" or better (or guarantors of such entities) may be counterparties. Financial Hedges are to be used only to lower the cost of the Authority's borrowing; to reduce exposure to changes in interest rates; or to manage the Authority's credit exposure to existing Financial Hedge counterparties. Currently, the Authority has no outstanding Financial Hedges.

LEGISLATIVE DEVELOPMENTS

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

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

LITIGATION

No litigation is pending or, to the knowledge of the Authority, threatened against or affecting the Authority seeking to restrain or enjoin the issuance, sale or delivery of the 2019 Bonds or in any way contesting or affecting the validity of the 2019 Bonds.

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

[End of Information Statement of the Authority.]

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MASSACHUSETTS PORT AUTHORITY

Financial Statements, Required Supplementary Information, and Supplementary Schedules

Years Ended June 30, 2018 and 2017

(With Report of Independent Auditors)

MASSACHUSETTS PORT AUTHORITY

Table of Contents

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Report of Independent Auditors

To the Members of the Massachusetts Port Authority

Report on the Financial Statements

We have audited the accompanying financial statements of the Massachusetts Port Authority (the Authority), as of and for the years ended June 30, 2018 and 2017, and the related notes to the financial statements, which collectively comprise the Authority's basic financial statements as listed in the table of contents.

Management's Responsibility for the Financial Statements

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

Auditor's Responsibility

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

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

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

Opinion

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of the Massachusetts Port Authority as of June 30, 2018 and 2017, and the changes in its financial position and its cash flows for the years then ended in conformity with U.S. generally accepted accounting principles.

Adoption of New Accounting Pronouncement

As discussed in Note 1 to the financial statements, as of July 1, 2016, the Authority adopted Governmental Accounting Standards Board Statement No. 75, *Accounting and Financial Reporting for Postemployment Plans Other Than Pension Plans*. Our opinion is not modified with respect to this matter.

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

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

Ernst + Young LLP

September 28, 2018

MANAGEMENT’S DISCUSSION AND ANALYSIS

The following Management’s Discussion and Analysis (MD&A) of the activities and financial performance of the Massachusetts Port Authority (the Authority) provides an introduction to the financial statements of the Authority for the fiscal years ended June 30, 2018 and 2017. This discussion was prepared by management, and it should be read in conjunction with the audited financial statements and notes that follow this section.

Overview of the Financial Statements

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

The comparative Statements of Net Position depict the Authority’s financial position as of a point in time, specifically June 30, 2018, 2017 and 2016, and include all assets, deferred outflows of resources, liabilities and deferred inflows of resources of the Authority. Net position represents the residual interest in the Authority’s assets and deferred outflows of resources after liabilities and deferred inflows of resources are deducted. The Authority’s net position is divided into three components: 1) net investment in capital assets, 2) restricted, and 3) unrestricted. Please see Note 1 in the financial statements attached hereto for a discussion on the Authority’s net position.

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

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

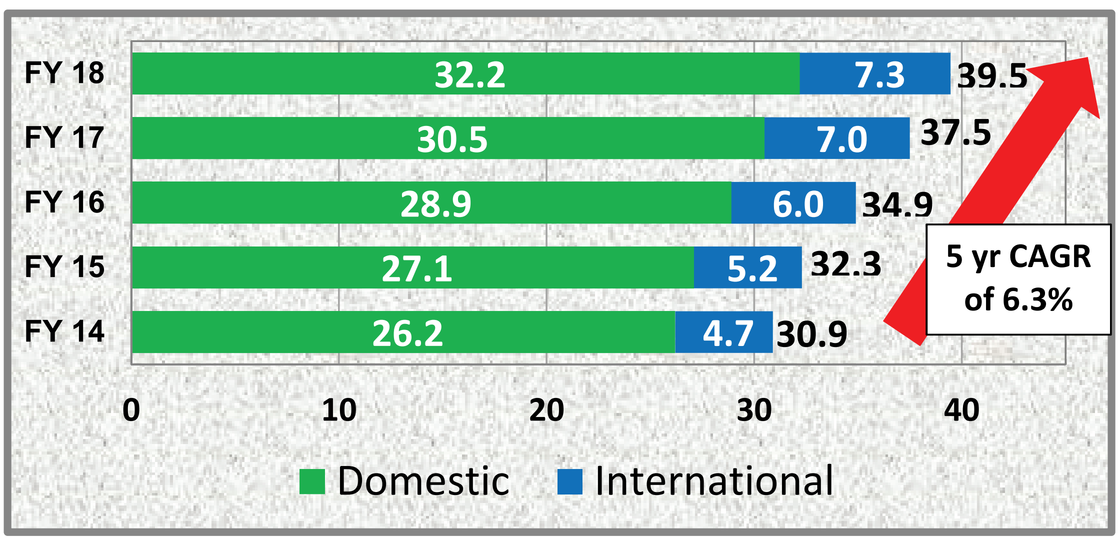
Business Activity Highlights for Fiscal Year 2018

Logan Airport sets new record by serving 39.5 million passengers, 2.0 million more passengers than prior year

- **Passengers** ↑ **5.4%** versus prior year.
- Domestic passengers of 32.2 million were up 1.7 million or 5.8%. Major contributors to growth were JetBlue Airways (+0.8 million passengers), Delta Air Lines (+0.4 million passengers) and Spirit Airlines (+0.2 million passengers).
- International passengers of 7.3 million were up 0.3 million or 3.7%. Factors contributing to the increase included new services by low cost carriers Norwegian Airlines and WestJet Airlines, the full year impact of Avianca's Bogota service initiated in late FY 2017, growth by Cathay Pacific to Hong Kong and the addition of service by Delta Air Lines to Dublin.
- Record number of 132 nonstop destinations served; 75 domestic and 57 international.
- Logan Express High Occupancy Vehicle (HOV) bus ridership between Logan Airport and Braintree, Framingham, Peabody and Woburn grew by 5.7%, in line with Logan Airport passenger growth.

LOGAN INTERNATIONAL AIRPORT

Passengers Served (Millions)

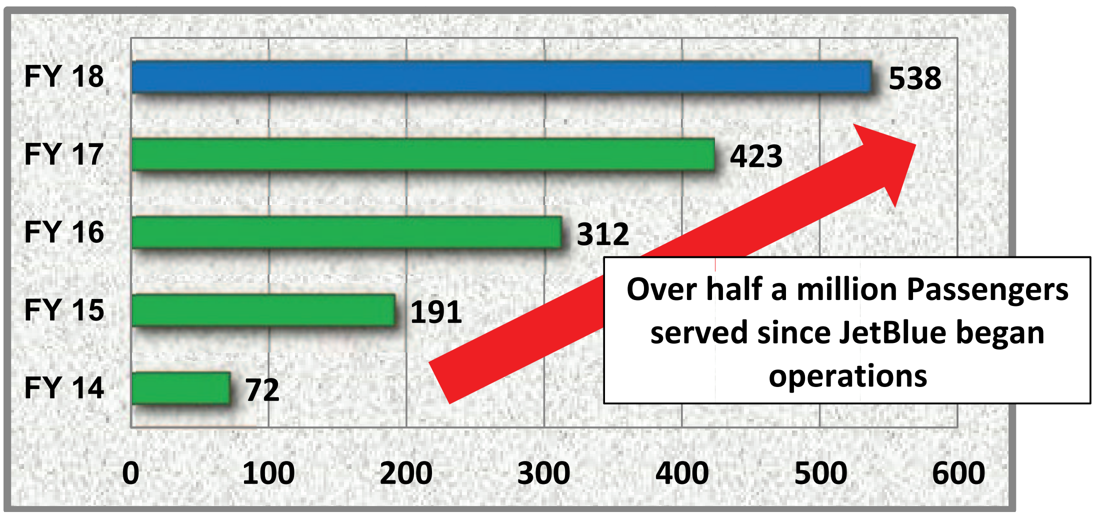


Worcester Regional Airport welcomes new JetBlue service to New York – JFK and American Airlines announces service

- **New airlines to serve Worcester ⬆ by 1** as American Airlines announced plans to introduce service between Worcester and its Philadelphia hub beginning in October 2018.
- Load Factors on Orlando and Ft. Lauderdale flights remained above 80%.
- Completed installation of CAT III Instrument Landing System to allow aircraft to use the airport during periods of poor visibility.

WORCESTER REGIONAL AIRPORT

Cumulative JetBlue Passengers (thousands)



Conley Terminal continued record-setting growth by handling 283,720 TEUs (Twenty-foot Equivalent Units)

- **TEU volume ⬆ 10.4%** versus prior year.
- Higher volume driven by strong New England economy, the efficiency of the terminal as demonstrated by minimal congestion for truckers accessing the terminal, highly productive workforce as evidenced by an average of 33 container lifts per hour per crane, and a strong focus on customer service.

- The trend toward larger container ships continued in FY18 as Conley was visited on May 23 by the largest ship ever to call on the terminal, the *Seaspan Elbe*, with a capacity of 10,000 TEUs.

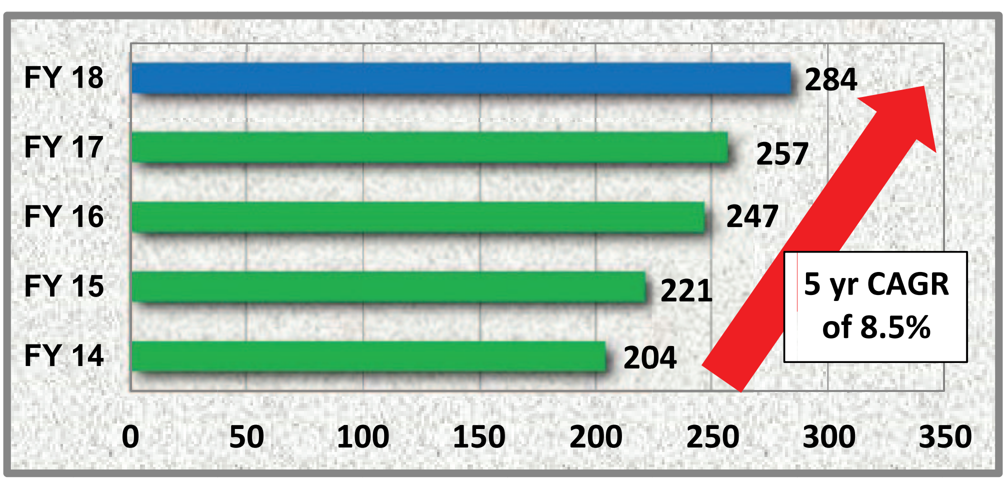
- Significant progress was made to accommodate the larger container ships during FY18. The Boston Harbor Dredging project advanced with the completion of the maintenance dredging component, which increased the depth of the inner portion of the harbor. The improvement dredging component to deepen the outer portion of the harbor leading into Conley Terminal was bid in FY18 and actual dredging began in July 2018. It is expected to be completed by the Army Corp of Engineers in FY22. When finished, the South North channel depth will be increased to 51 feet, and the Main Shipping Channel (MSC) and turning basin will be deepened and widened to 47 feet.

- The Conley Terminal modernization initiative, funded in part with a $42 million FASTLANE grant from the federal government, also advanced during FY18. At Berth 12, 20 new fenders capable of accommodating the larger cargo vessels were installed to replace the older obsolete ones. At Berth 11, structural improvements began and a contract to deepen that berth was awarded. Finally, the procurement process to replace all 14 of the yard tractors began, with the first seven scheduled for delivery in November 2018.

- Construction of the new deep-water Berth 10 began in June 2018, and the Authority is in the process of acquiring three new cranes capable of servicing the larger container ships. This work is being partially funded with $107.5 million of state funds.

CONLEY CONTAINER TERMINAL

TEUs PROCESSED (thousands)



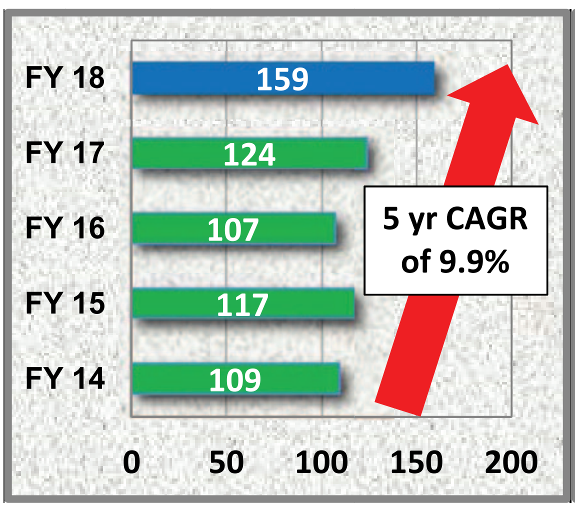
Flynn Cruiseport sets new record by serving 159 Cruise Ships and 406,369 Passengers

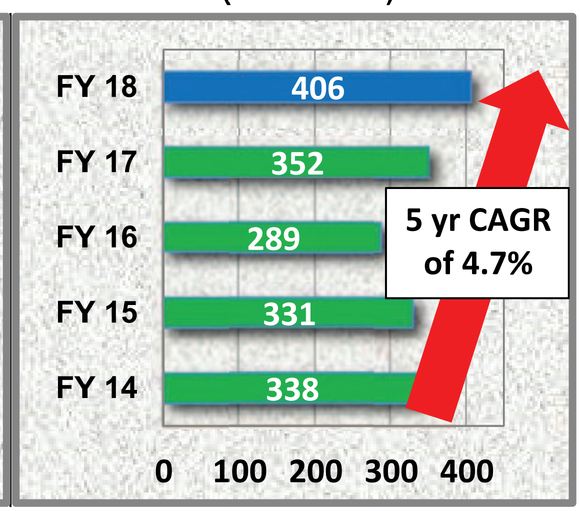
- Number of **ship calls** ⬆ **28.2%** or 35 ships versus prior year.
- **Cruise passengers** ⬆ **15.5%** or 54,455 passengers versus prior year.
- Ship and Passenger volume increased due to an earlier start to cruise season 2018 and more ship calls early and late in the season as well as introduction of new itineraries such as Cuba.
- Flynn Cruiseport Boston welcomed three new cruise lines during FY18, including TUI with Mein Schiff 6, Hurtigruten with the MS Fram, and Noble Caledonia with the Hebridean Sky.

FLYNN CRUISEPORT BOSTON

SHIP CALLS

PASSENGERS (thousands)





Real Estate opens South Boston Waterfront Transportation Center (SBWTC); Construction begins on other parcels

- The South Boston Waterfront Transportation Center opened for business in May 2018. This facility includes a 1,550-space garage to support the rapid growth in the Seaport District, and also serves as a mobility hub for the community with a connection to the MBTA and other transportation modes. It is located near the Boston Convention and Exhibition Center and next to the new Omni Hotel that is under construction.

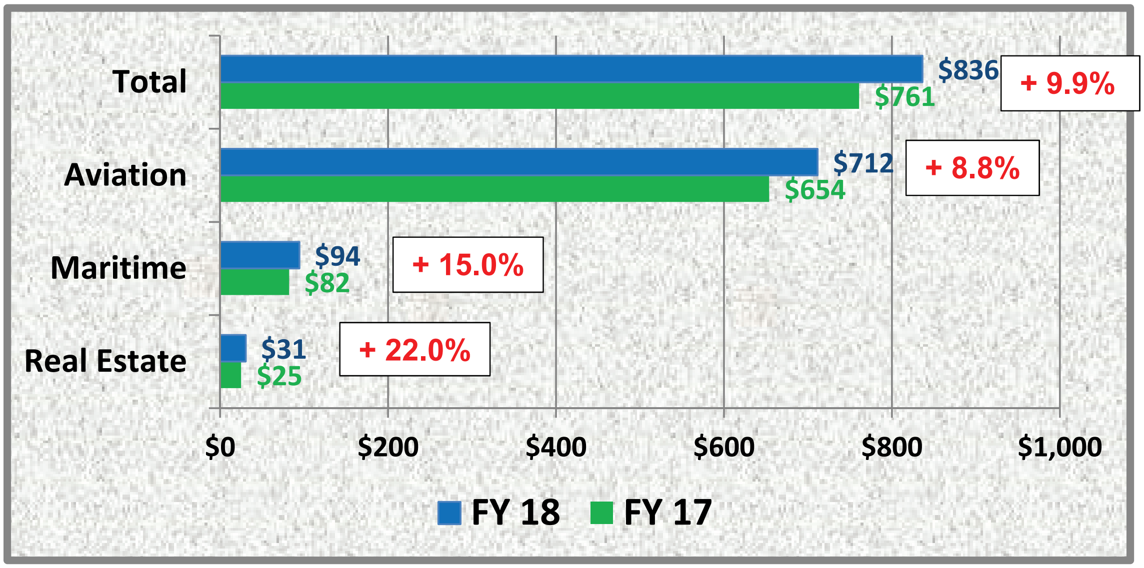
- Held groundbreaking ceremony for the 1,000+ room Omni Hotel being constructed on land owned by the Authority across from the Boston Convention and Exhibition Center. In addition to providing hotel capacity to support convention center demand, the Authority's decision to select Omni was based in part on first of its kind diversity and inclusion criteria to have minority-owned businesses participate in the equity, design, construction, development and hotel operations.
- Developers began construction on two properties in South Boston, a mixed-use development on land owned by the Authority known as Parcel K that will have a Hyatt Place hotel as well as an apartment complex, and on Gables Seaport, which is the next phase of the Waterside Place apartment complex.

Financial Highlights for Fiscal Year 2018

Operating Revenue increased $75 million to $836 million

- **Total Operating Revenue** ↑ **9.9%** versus prior year.
- Aviation revenue up $57.7 million or 8.8% due to recovery of operating and capital costs from airlines, $11 million in additional parking revenue due mainly to a $3.00 rate increase, and volume-related revenues such as concessions driven by the 5.4% increase in passengers. This revenue is being used to fund Massport's strategic initiatives and its FY18 – FY22 capital program of $2.4 billion that was approved by the board of directors.
- Maritime revenue up $12.3 million or 14.9% due to a 10% increase in container volume, 15% increase in cruise passengers, and 3%-8% increases in demurrage, usage, wharfage and dockage rates effective January 1, 2018. This revenue is being used to fund Boston Harbor dredging, new cranes, new berths and other improvements for Conley Terminal with an estimated total cost of $850 million.
- Real Estate revenue up $5.5 million or 22.0% due to a one-time closing payment by a developer and higher ground rents, which will be used to support the Conley Terminal strategic plan.

OPERATING REVENUES
($ Millions)



Expenses increased $30 million to $757 million

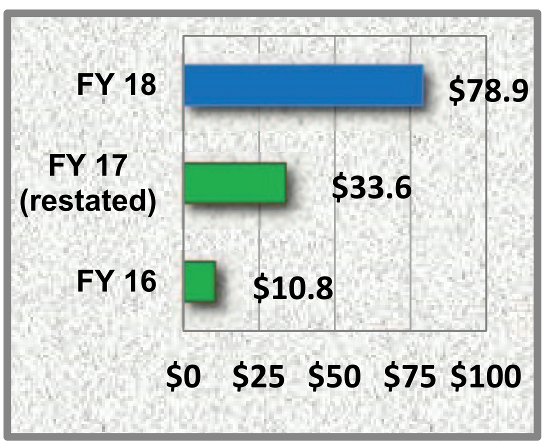
- Higher business activity caused expenses to increase by $5.9 million for items including stevedoring, shuttle bus operation, overtime for container handling, cruise terminal operations and Logan Airport traffic control, credit card processing fees and airport terminal cleaning.
- Payroll expense increased by $5.5 million or 3.0% due primarily to the annual merit and collectively bargained wage increases.
- Utilities expenses were higher by $5.3 million or 16.8% due to a 23% increase in electricity rates.
- Weather-related expenses were up $3.2 million due to 60 inches of snow in fiscal year 2018 versus 48 inches in fiscal year 2017.
- Supplies, Materials, Repairs and Services expenses increased by $3.6 million to enable the airports and port to operate safely and efficiently.
- Miscellaneous expenses were up $5.2 million due primarily to Logan Terminal B and C roadway work, training of a new State Police class, and asset write down for Logan Airport Hangar 16.
- Pension and Other Post-Employment Benefits (OPEB) expense decreased by $9.9 million or 25.4% due to favorable net investment returns of 16.51% (Pension) and 7.59% (OPEB).

- PILOT (Payment in Lieu-of-Taxes) expense was higher by $1.1 million due to the annual increase attributed to growth in the Consumer Price Index and community mitigation payments.
- Depreciation and Amortization expense increased $9.3 million or 3.7% due to $294.3 million of new investment in the Authority's assets.

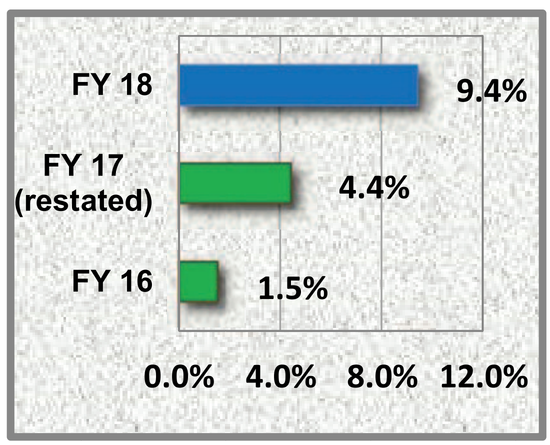
Operating income was $78.9 million, up from $33.6 million in prior year

- In order to fund Massport's $2.4 billion capital program, management's plan called for revenue growth from airline cost recovery, a Logan Airport parking fee increase, and higher business volume revenues to exceed expense growth of 4% resulting in operating income margin expansion.
- FY2018 operating income margin of 9.4% higher than the restated FY2017 margin of 4.4%, but still well below peer airport levels.

OPERATING INCOME
($ Millions)



OPERATING MARGIN



Net Position increased by 7.8%

- Net position is a key indicator of the financial health of the Authority and is comprised primarily of capital assets owned by the Authority. Growth in these capital assets as the Authority invests more in its businesses has resulted in a steady increase in net position over the last several years.
- The fiscal year 2018 increase in net position of $156.2 million was due to $78.9 million of operating income, $51.9 million of non-operating income, and $25.4 million of capital grant revenue.

- Expansion of the Authority's net income will be used to fund the $2.4 billion of capital programs. It will fund critical strategic initiatives such as adding parking capacity and reducing roadway congestion at Logan Airport, the expansion of Terminal E to accommodate more international flights, and the dredging of Boston Harbor and modernization of Conley Terminal to support the industry trend toward larger 10,000+ TEU container ships.
- The impact of GASB 75, which required the Authority to restate fiscal year 2017 results to include the OPEB liability, was a reduction to net position by $165.1 million.

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

	FY 2018	FY 2017 *(Restated)*	$ Change	% Change
Operating revenues	$ 836.4	$ 760.9	$ 75.5	9.9%
Operating expenses including depreciation and amortization	757.5	727.3	30.2	4.2%
Operating income	**78.9**	**33.6**	**45.3**	**134.8%**
Total non-operating revenues (expenses), net	51.9	43.1	8.8	20.4%
Capital grant revenues	25.4	12.6	12.8	101.6%
Increase (decrease) in net position	**156.2**	**89.3**	66.9	74.9%
Net position, beginning of year	2,008.1	1,918.8	89.3	4.7%
Net position, end of year	**$ 2,164.3**	**$ 2,008.1**	**$ 156.2**	**7.8%**

Note: Fiscal year 2017 results were restated to conform to GASB No. 75 standards for reporting OPEB costs.

	FY 2017 *(Restated)*	FY 2016	$ Change	% Change
Operating revenues	$ 760.9	$ 699.5	$ 61.4	8.8%
Operating expenses including depreciation and amortization	727.3	688.7	38.6	5.6%
Operating income	**33.6**	**10.8**	**22.8**	**211.1%**
Total non-operating revenues (expenses), net	43.1	38.5	4.6	11.9%
Capital grant revenues	12.6	56.0	(43.4)	-77.5%
Increase (decrease) in net position	**89.3**	**105.3**	(16.0)	-15.2%
Net position, beginning of year	2,083.9	1,978.6	105.3	5.3%
Cumulative effect of implementing GASB no. 75	(165.1)	0.0	0.0	0.0%
Net position, beginning of year	1,918.8	0.0	0.0	0.0%
Net position, end of year	**$ 2,008.1**	**$ 2,083.9**	**($ 75.8)**	**-3.6%**

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

OPERATING REVENUES

The Authority's operating revenues for fiscal year 2018 were $836.4 million, an increase of $75.5 million or 9.9% over fiscal year 2017. This growth was primarily the result of additional concession revenue driven by the 5.4% increase in passengers at Logan Airport, higher parking revenue due to a fee increase to fund strategic initiatives, higher container volume at Conley Terminal, and the recovery of operating and capital investment expenses from the airlines in the form of higher Landing Fees and Terminal Rent. This revenue increase will help fund the Authority's $2.4 billion capital program.

Operating Revenues
($ millions)

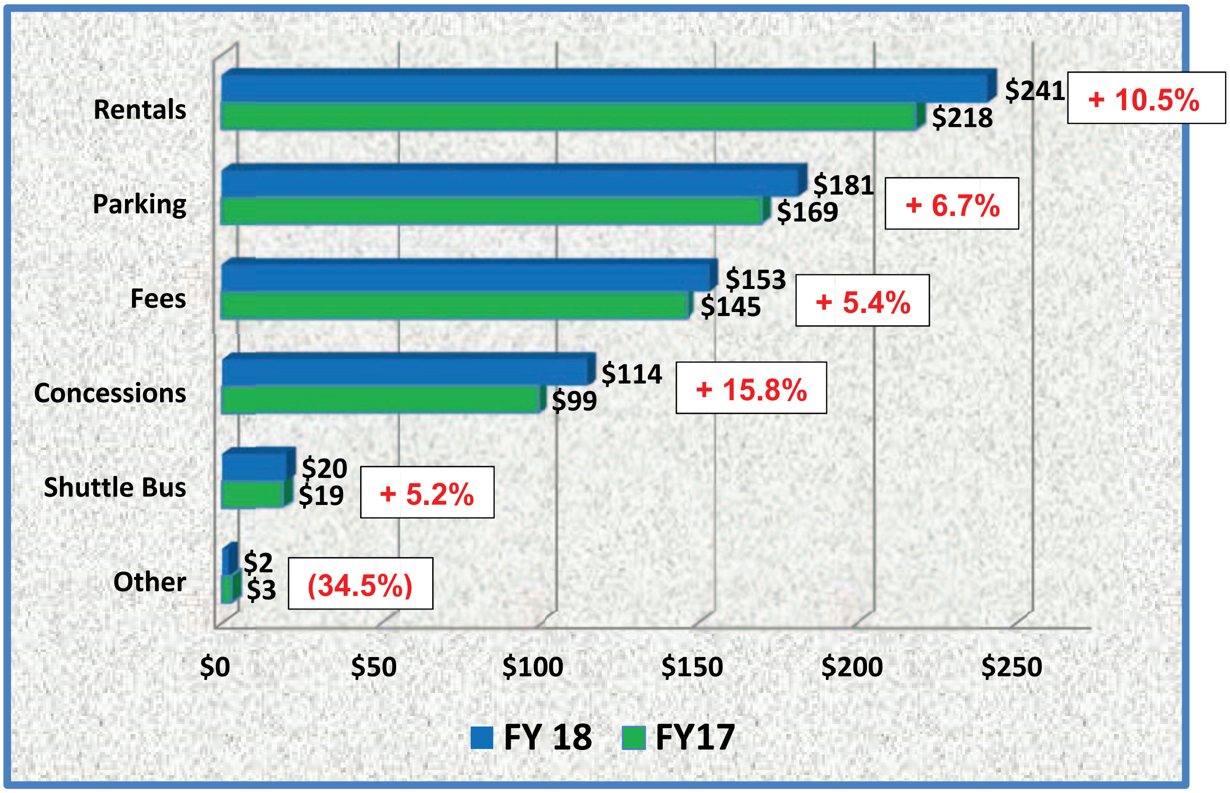
	FY 2018	FY 2017	$ Change	% Change
Aviation Rentals	$ 240.8	$ 217.9	$ 22.9	10.5%
Aviation Parking	180.8	169.4	11.4	6.7%
Aviation Fees	153.2	145.4	7.8	5.4%
Aviation Concessions	114.5	98.9	15.6	15.8%
Shuttle Bus	20.3	19.3	1.0	5.2%
Aviation Operating Grants and Other	1.9	2.9	(1.0)	-34.5%
Total Aviation Revenues	**$ 711.5**	**$ 653.8**	**$ 57.7**	**8.8%**
Maritime Fees, Rentals and Other	94.4	82.1	12.3	15.0%
Real Estate Fees, Rentals and Other	30.5	25.0	5.5	22.0%
Total	**$ 836.4**	**$ 760.9**	**$ 75.5**	**9.9%**

	FY 2017	FY 2016	$ Change	% Change
Aviation Rentals	$ 217.9	$ 198.1	$ 19.8	10.0%
Aviation Parking	169.4	154.6	14.8	9.6%
Aviation Fees	145.4	139.4	6.0	4.3%
Aviation Concessions	98.9	87.4	11.5	13.2%
Shuttle Bus	19.3	18.0	1.3	7.2%
Aviation Operating Grants and Other	2.9	2.8	0.1	3.6%
Total Aviation Revenues	**$ 653.8**	**$ 600.3**	**$ 53.5**	**8.9%**
Maritime Fees, Rentals and Other	82.1	74.7	7.4	9.9%
Real Estate Fees, Rentals and Other	25.0	24.5	0.5	2.0%
Total	**$ 760.9**	**$ 699.5**	**$ 61.4**	**8.8%**

AVIATION REVENUES

Aviation Revenues by Category

($ Millions)



Fiscal Year 2018 Compared to 2017

The Authority's aviation revenues are derived from its three airport facilities: Logan Airport, Hanscom Field and Worcester Regional Airport. The Authority earned $711.5 million in revenues from its aviation operations in fiscal year 2018.

Aviation Revenues

($ millions)

	FY 2018	FY 2017
Logan	$ 695.4	$ 639.3
Hanscom	14.3	12.9
Worcester	1.8	1.6
Total	$ 711.5	$ 653.8

Logan Airport Revenues

Logan Airport generated $695.4 million in revenues in fiscal year 2018, a $56.1 million, or 8.8% increase over last year due to another record-breaking year of 39.5 million passengers that favorably impacted concessions and other passenger volume driven revenues. Other major contributors to the increase were a $3.00 parking rate increase and the recovery of terminal operating and capital costs from the airlines using the airport.

Logan Airport Revenues
($ millions)

	FY 2018	FY 2017
Logan Rentals	$ 233.3	$ 211.3
Logan Parking	180.3	168.9
Logan Fees	146.0	138.9
Logan Concessions	113.6	98.0
Shuttle Bus	20.3	19.3
Logan Operating Grants and Other	1.9	2.9
Total	$ 695.4	$ 639.3

Aviation rentals revenues are earned through terminal building, non-terminal building and ground lease agreements. Revenue from Logan Airport rentals was $233.3 million, a $22.0 million or 10.4% increase over prior year. Terminal rent accounts for 77.4% of this revenue, and increased by $18.9 million. This was driven primarily by the recovery of terminal operating and capital costs from the airlines in the form of higher terminal rental rates. Some of the capital projects responsible for the cost and associated recovery increase include the Terminal E Renovation and Enhancement project, the Terminal B, C and E Heating, Ventilation and Air Conditioning (HVAC) system upgrade, and Improvements to the Customs and Border Patrol (CBP) area in Terminal E. The other contributor was the 3.7% increase in international passengers as the airlines pay an arrival and departure fee per international passenger to use Terminal E.

Aviation parking revenues are primarily generated from the Authority's on-airport and off-airport parking facilities. This revenue is essential to fund the Authority's $2.4 billion capital investment program. In fiscal year 2018, Logan parking revenue was $180.3 million, up $11.4 million or 6.7% versus prior year due primarily to a $3.00 rate increase at all Logan parking facilities that was introduced at the beginning of fiscal year 2018. Commercial parking on-site at Logan Airport accounted for $9.6 million of the increase and grew by 6.2%, while employee parking increased by $1.2 million. Parking revenue from the three off-airport Logan Express parking locations was $6.2 million, up $0.7 million or 12.7% due to a 6% increase in passengers and an increase in the average number of days parked to 5.5.

Revenues from aviation fees consist of revenues earned from aircraft landing fees, utility reimbursements, and other aviation related fees such as aircraft parking and fueling. During fiscal year 2018, Logan Airport aviation fees were $146.0 million, a $7.1 million or 5.1% increase over prior year. Logan Airport aircraft landing fees, which account for 81.6% of Logan aviation fees, were higher by $6.0 million or 5.3% versus fiscal year 2017. These landing fees are collected from scheduled and non-scheduled airlines based on the landed weight of aircraft serving Logan Airport. The landing fee rate is determined annually based on full cost recovery of landing field operating and capital costs required to operate and maintain the airfield at Logan Airport in a safe and efficient manner for the Authority's airline customers. The increase in costs recovered in fiscal year 2018 was driven by higher operating costs for items including repairs, maintenance, snow removal and utilities, as well as an increase in capital costs for items including Logan Airport Terminal E ramp area renovations and enhancements, new in-ground snow melters and the rehabilitation of two taxiways.

Logan Airport Aviation Fees

($ millions)

	FY 2018	FY 2017
Landing Fees	$ 119.2	$ 113.2
Utilities	15.7	15.3
Other	11.1	10.4
Total	$ 146.0	$ 138.9

Aviation concessions revenues are earned from airport terminal retail operations, on-airport car rental transactions, and the activities of ground transportation and other service providers including taxis, bus, limousine, Transportation Network Companies (TNCs), aircraft ground handling, and in-flight catering. In fiscal year 2018, Logan Airport earned $113.6 million from concessions compared to $98.0 million in fiscal year 2017, an increase of $15.6 million or 15.9%. Revenues from in-terminal concessions totaled $48.5 million, an increase of $8.5 million or 21.2% compared to the prior year. This increase was mainly due to a $5.5 million increase in food and beverage and retail revenues due to the 5.4% increase in passengers coupled with a new concessions management agreement with MarketPlace Logan LLC that went into effect in FY18. This agreement is providing new restaurant and retail offerings for Logan Airport customers while also allowing the Authority to enjoy a larger share of the revenue versus prior management agreements. Duty Free revenues increased by $1.4 million and foreign exchange revenues increased by $0.7 million in FY18 due in part to more international passengers, and advertising revenue was up by $0.9 million due to a higher volume of ads at Logan Airport.

During fiscal year 2018, Logan Airport earned $34.0 million from rental car companies, an increase of $0.7 million or 2.0% primarily due to a 5.3% growth in revenue per transaction versus the prior year partially offset by fewer transactions. Ground transportation fees collected from Taxis, Limos, and TNCs totaled $15.2 million, an increase of $3.7 million or 31.8% driven by a 23% increase in pick-ups. This increase in revenue is being used to fund modifications to Logan Airport's roadways as the increase in vehicle volume is significantly increasing roadway congestion. Other concession revenues from commercial services and ground servicing increased by $2.7 million or 20.7% due to higher levels of passengers and aircraft operations.

Logan Airport Concession Fees
($ millions)

	FY 2018	FY 2017
In-Terminal	$ 48.5	$ 40.0
Rental Car	34.0	33.3
Ground Transportation & Other	31.1	24.7
Total	$ 113.6	$ 98.0

The Authority earned $20.3 million of revenue in fiscal year 2018 for the Logan Airport shuttle bus operations, an increase of $1.1 million over last year. Shuttle bus operations are comprised of an on-airport shuttle that links the terminal buildings, rental car center, and MBTA station, as well as the bus operations from four off-airport Logan Express sites in the Boston metropolitan region and Boston's Back Bay area. Revenue from the on-airport shuttle bus increased by $0.7 million or 11.7% due to the recovery of operating expenses required to maintain the Rental Car Facility. Logan Express revenue from the four sites at Braintree, Framingham, Peabody and Woburn increased by $0.2 million due to a 5.7% increase in ridership.

During fiscal year 2018, Logan Airport received $1.9 million in revenues from federal operating grants compared to $2.9 million in the prior year. The $1.0 million decline was due to $1.1 million in reimbursements received in fiscal year 2017 from FEMA for Blizzard Juno in fiscal year 2015.

Logan Airport Shuttle Bus and Other Revenues
($ millions)

	FY 2018	FY 2017
Shuttle Bus	$ 20.3	$ 19.2
Other	1.9	2.9
Total	$ 22.2	$ 22.1

Hanscom Field and Worcester Regional Airport Revenues

Hanscom Field revenues were $14.3 million in fiscal year 2018, up $1.4 million or 10.9% from the prior year. The increase was due to higher ground rent of $0.9 million primarily from the new Jet Aviation Hangar and FBO Terminal, which opened in June 2017. Aircraft fuel flowage and landing fees at the airport also contributed to the revenue increase. Worcester Regional Airport had $1.8 million in operating revenues in fiscal year 2018, up $0.2 million due to higher aircraft fuel flowage, utility reimbursement, parking and other miscellaneous items.

Hanscom and Worcester Revenues
($ millions)

	FY 2018	FY 2017
Hanscom	$ 14.3	$ 12.9
Worcester	1.8	1.6
Total	$ 16.1	$ 14.5

Fiscal Year 2017 Compared to 2016

The Authority earned $653.8 million in revenues from its aviation operations in fiscal year 2017, up $53.5 million or 8.9% compared to prior year.

Revenue from Logan Airport rentals was $211.3 million, a $19.8 million or 10.3% increase over prior year. Terminal rent accounts for 76.5% of this revenue, and increased by $19.5 million. This was driven primarily by the recovery of terminal operating and capital costs from the airlines in the form of higher terminal rental rates. The other major contributor was the 15.9% increase in international passengers as the airlines pay an arrival and departure fee per international passenger to use Terminal E.

Aviation parking revenues are primarily generated from the Authority's on-airport and off-airport parking facilities. Logan parking revenue was $168.9 million, up $14.8 million or 9.6% versus prior year due primarily to a rate increase at all Logan parking facilities. Parking revenue from the three off-airport Logan Express locations was $5.5 million, up $0.7 million or 14.1% due to a 6% increase in passenger use and a longer duration in the average number of days parked.

During fiscal year 2017, Logan Airport aviation fees were $138.9 million, a $5.2 million or 3.9% increase over prior year. Logan Airport aircraft landing fees, which account for more than 80% of Logan aviation fees, were higher by $8.7 million or 8.3% in fiscal year 2017 and reflect operating and capital cost recovery.

Logan concessions revenues earned from airport terminal food, beverage and retail operations, on-airport car rental transactions, the activities of ground transportation and other service providers including taxis, bus, limousine, TNCs, aircraft ground handling, advertising and in-flight catering totaled $98.0 million in fiscal year 2017. This was $11.4 million or 13.2% higher than the $86.6 million in fiscal 2016 due to the 7.4% increase in passengers, stronger advertising sales, and higher rental car revenues per transaction.

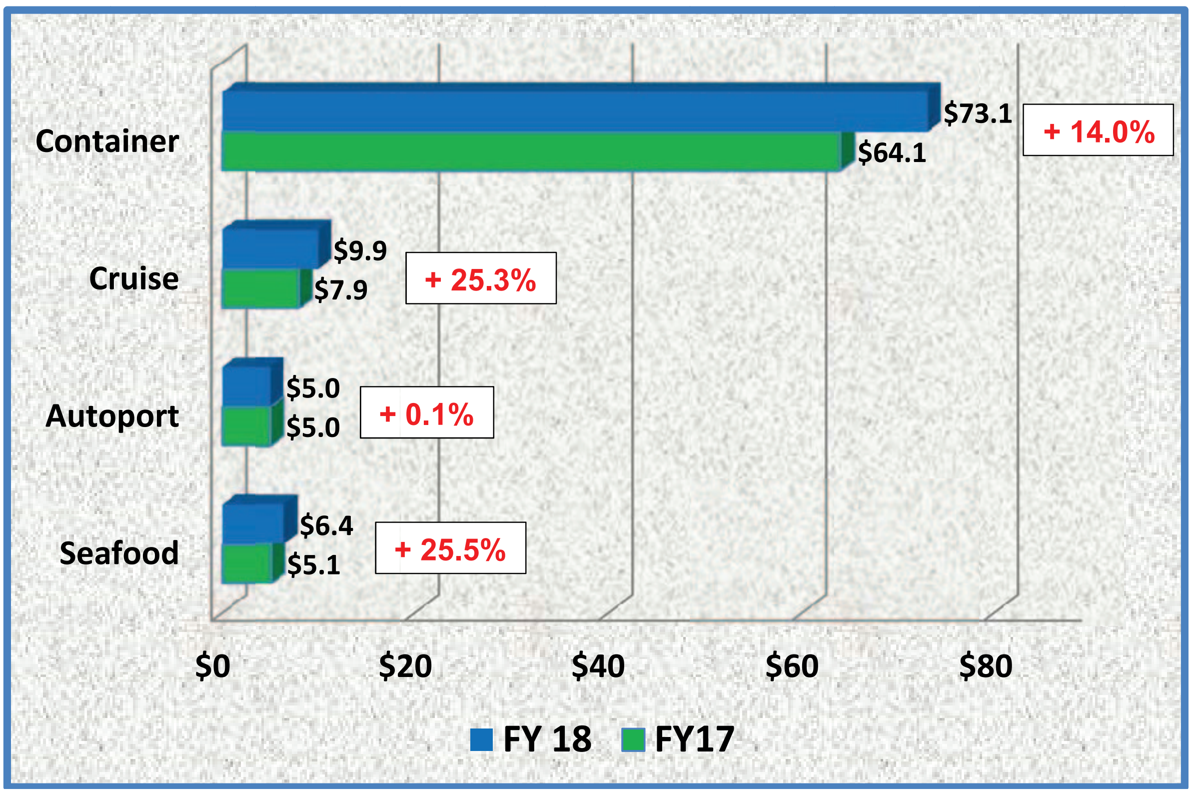
Logan Airport shuttle bus operations generated $1.2 million over prior year due to an increase in Logan Express ridership. Federal operating grant revenue was $0.3 million higher.

Hanscom Field revenues were up $0.7M or 5.7% from prior year due to higher aircraft fuel flowage and landing fees at the airport, while Worcester Regional Airport revenues were comparable to prior year.

MARITIME REVENUES

Maritime Revenues by Category

($ Millions)



Fiscal Year 2018 Compared to 2017

Maritime fees, rentals and other revenues are collected primarily from container shipping lines, cruise ship lines and other customers that use the Authority's Port facilities. The Authority's maritime business includes cargo container ship operations at Conley Terminal, cruise activity at the Flynn Cruiseport, rental facilities for seafood processors and commercial parking at the Boston Fish Pier in South Boston, and the Moran Terminal, which houses an automobile import/export facility and other port properties in Charlestown. The Authority collected $94.4 million in fees, rentals and other income from its maritime operations in fiscal year 2018.

Maritime Revenues
($ millions)

	FY 2018	FY 2017
Containers	$ 73.1	$ 64.1
Cruise	9.9	7.9
Seafood	6.4	5.1
Autoport	5.0	5.0
Total	$ 94.4	$ 82.1

During fiscal year 2018, the container business at Conley Terminal earned $73.1 million in revenues, which was $9.0 million or 14.0% higher than the prior year. Revenue is generated through the collection of fees from ocean shipping lines for the loading and unloading of containers at Conley Terminal and for related services through tariffs and contracts with the shipping lines and shippers using the Port. Conley Terminal processed a record 283,720 TEUs, a 10.4% increase over the prior year.

Revenues from operations at the Flynn Cruiseport were $9.9 million in fiscal year 2018, up $2.0 million or 25.3% versus prior year. The Authority collects per passenger fees as well as dockage, water and equipment rental charges from home-port and port-of-call cruise ships that dock at the Cruiseport. Fiscal year 2018 cruise passengers increased by 15.5% over prior year as the benefits from marketing incentive programs to reward cruise lines for meeting certain targets and expanding itineraries continued to have a positive impact. Ship calls increased by 28% as the length of the cruise season increased and there were more sailings in the shoulder seasons.

Seafood revenues grew to $6.4 million in fiscal year 2018, up 25.5% from the prior year. Revenues are earned through space and ground rents from seafood processing and office tenants, commissions, utility charges, fees and parking lots at the Fish Pier. The $1.3 million increase in seafood revenues in fiscal year 2018 is due to a $0.5 million increase in rental income, contractual increases in ground lease revenues of $0.4 million, higher parking revenue of $0.2 million and utility fee reimbursements of $0.2 million.

The Autoport earned $5.0 million in fiscal year 2018, which was comparable to the fiscal year 2017 amount. Revenue increases from ground leases, commissions on fuel sales and utility reimbursement fees were offset by a reduction in supplemental revenue due to the payment of property taxes to the City of Boston.

Fiscal Year 2017 Compared to 2016

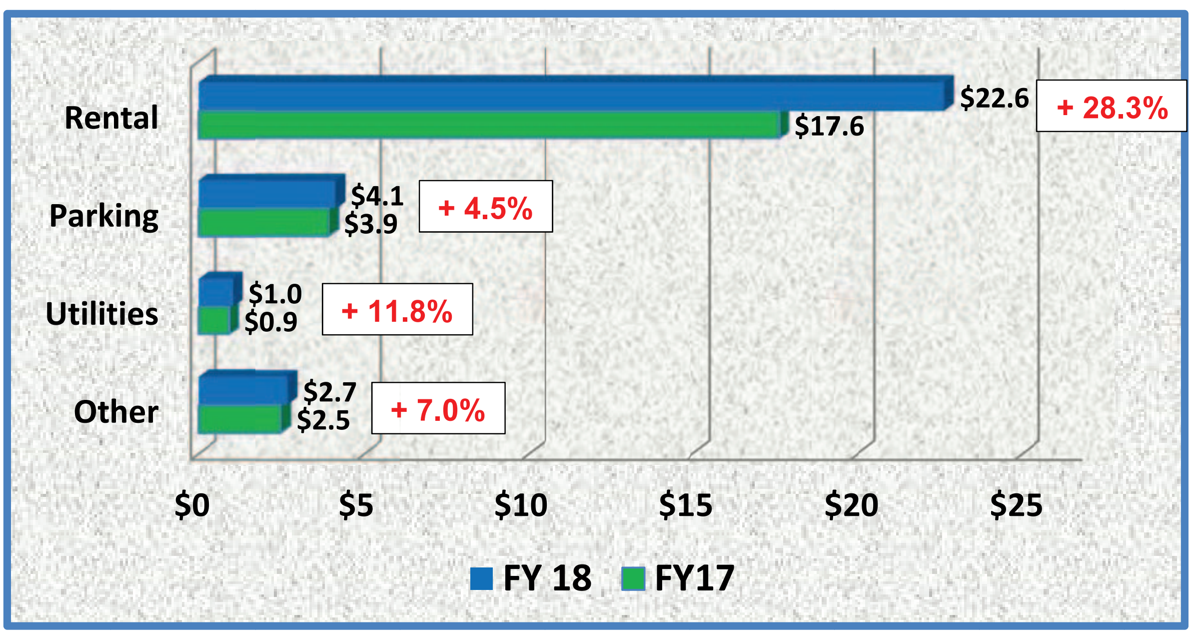
The Authority collected $82.1 million in fees, rentals and other income from its maritime operations in fiscal year 2017. This was $7.4 million or 9.9% higher than the prior year.

Container revenues were higher by $4.8 million or 8.1% as Conley Terminal set a new record by processing 256,951 TEUs, a 3.9% increase over prior year. Cruiseport revenues increased by $2.1 million or 36.1% due to 21.7% more passengers as the result of a new marketing incentive program and a full season of sailings by Norwegian Cruise Lines' Norwegian Dawn. Seafood and Autoport revenues increased by a combined $0.5 million primarily due to higher ground lease and utility reimbursement revenues.

REAL ESTATE REVENUES

Real Estate Revenues by Category

($ Millions)



Fiscal Year 2018 Compared to 2017

The Authority's commercial real estate line of business earns revenues from ground leases, district service fees and parking on properties owned by the Authority in South Boston, East Boston and Charlestown. Revenues from the Authority's real estate activities totaled $30.5 million in fiscal year 2018, up $5.5 million or 22.0% versus prior year.

Real Estate Revenues
($ millions)

	FY 2018	FY 2017
Real Estate	$ 30.5	$ 25.0

The increase in revenue was primarily due to a $5.0 million increase in ground rent income due to a one-time closing payment on a parcel in South Boston from a developer, along with annual escalations to existing leases. Parking revenue increased by $0.2 million due in part to the opening of the South Boston Waterfront Transportation Center in May 2018. This new facility has 1,550 spaces, and will be supplemented during FY2019 with branding, public realm, and other enhancements. Other revenue increases included higher utility fee reimbursements of $0.1 million and other miscellaneous increases of $0.2 million.

Fiscal Year 2017 Compared to 2016

Revenues from the Authority's real estate activities in fiscal year 2017 totaled $25.0 million and reflected an increase of $0.5 million versus fiscal year 2016. The increase was primarily due to a $0.3 million increase in ground rent income due to annual adjustments to leases, higher utility fee reimbursements of $0.1 million and other miscellaneous increases of $0.1 million.

OPERATING EXPENSES

The Authority's total operating expenses in fiscal year 2018 were $757.5 million, an increase of $30.2 million or 4.2% over the prior year. The increase was due primarily to a $27.8 million or 8.0% increase in operations and maintenance expenses to support higher business activity. Pension and other post-employment benefits expense declined by a combined $9.9 million or 25.4% due to favorable net investment returns of 16.51% (Pension) and 7.59% (OPEB). Depreciation and amortization expense increased by $9.3 million or 3.7% as $294.3 million of assets were placed into service.

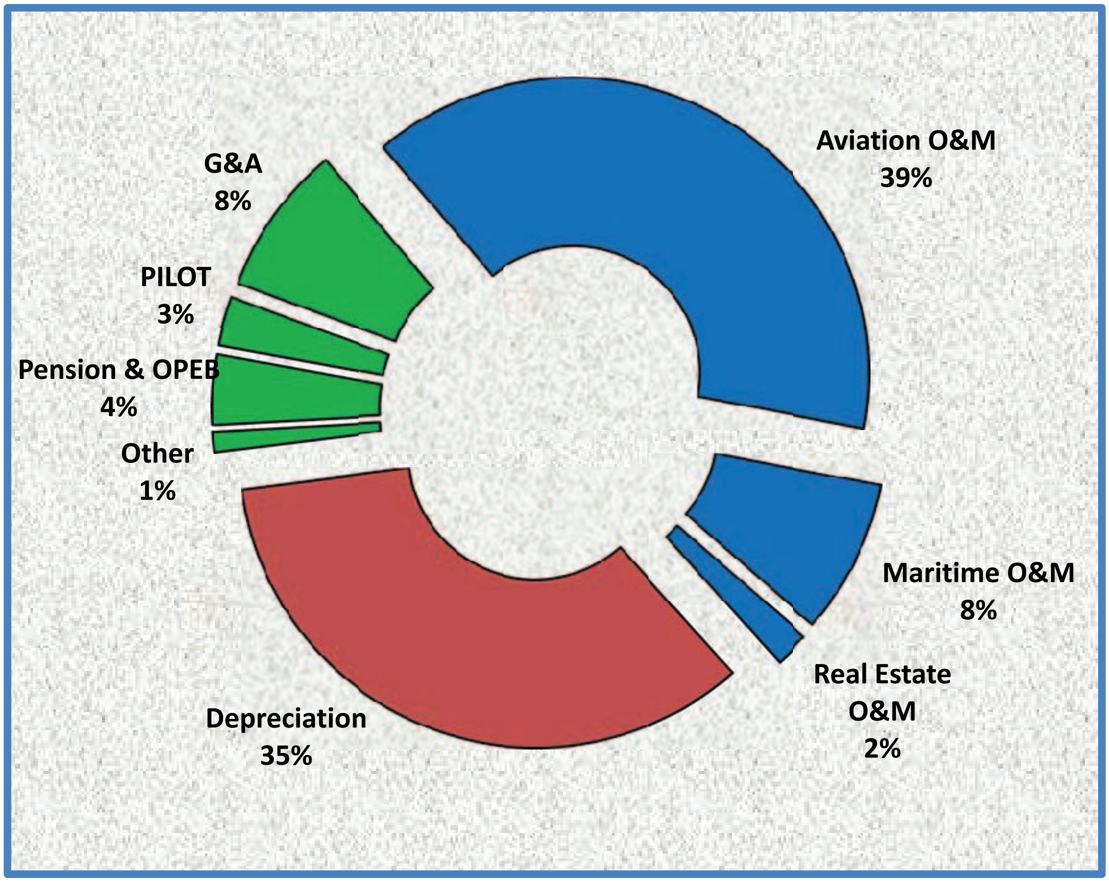
Operating Expenses
($ millions)

	FY 2018	FY 2017 (Restated)	$ Change	% Change
Aviation Operations and Maintenance	$ 296.2	$ 274.5	$ 21.7	7.9%
Maritime Operations and Maintenance	64.0	59.6	4.4	7.4%
Real Estate Operations and Maintenance	14.9	13.2	1.7	12.9%
General and Administrative	62.5	59.4	3.1	5.2%
Payments in Lieu of Taxes	20.4	19.3	1.1	5.7%
Pension and Other Post-employment Benefits	29.0	38.9	(9.9)	-25.4%
Other	8.4	9.6	(1.2)	-12.5%
Depreciation and Amortization	262.1	252.8	9.3	3.7%
Total Operating Expenses	**$ 757.5**	**$ 727.3**	**$ 30.2**	**4.2%**

	FY 2017 (Restated)	FY 2016	$ Change	% Change
Aviation Operations and Maintenance	$ 274.5	$ 261.1	$ 13.4	5.1%
Maritime Operations and Maintenance	59.6	53.4	6.2	11.6%
Real Estate Operations and Maintenance	13.2	11.9	1.3	10.9%
General and Administrative	59.4	58.2	1.2	2.1%
Payments in Lieu of Taxes	19.3	19.4	(0.1)	-0.5%
Pension and Other Post-employment Benefits	38.9	29.7	9.2	31.0%
Other	9.6	7.6	2.0	26.3%
Depreciation and Amortization	252.8	247.5	5.3	2.1%
Total Operating Expenses	**$ 727.3**	**$ 688.7**	**$ 38.6**	**5.6%**

Note: Fiscal Year 2016 Pension and Other Post-employment Benefits expense does not reflect the changes in accounting for OPEB costs proscribed by GASB No. 75.

FY18 Operating Expenses by Category
(% of Total Expenses)



Aviation Operations and Maintenance Expenses – FY 2018

In fiscal year 2018, aviation operations and maintenance expenses were $296.2 million, an increase of $21.7 million or 7.9% over the previous year. The breakdown of aviation operations and maintenance expenses by each of Massport's aviation facilities is provided below:

Aviation Operating and Maintenance Expenses
($ millions)

	FY 2018	FY 2017	FY 2016
Logan	$ 277.4	$ 257.8	$ 245.1
Hanscom	11.8	10.2	9.3
Worcester	7.0	6.5	6.7
Total	$ 296.2	$ 274.5	$ 261.1

Logan Airport Operations and Maintenance Expenses – FY 2018

Operations and maintenance expenses for Logan Airport in fiscal year 2018 were $277.4 million and accounted for approximately 93.7% of all aviation operations and maintenance expenses and 74.0% of the Authority's total operations and maintenance expenses. In fiscal year 2018, operations and maintenance expenses for Logan Airport increased by $19.6 million, or 7.6% over the prior year.

Increased business activity resulted in a $2.7 million cost increase for items including shuttle bus operations, terminal building cleaning, overtime for Logan Airport ground traffic control and credit card processing fees for parking operations. Utility expenses increased by $3.5 million due to a 23% increase in the cost of electricity. Payroll expense was higher by $4.3 million due to merit increases and collectively bargained wage adjustments. Weather-related costs increased by $2.5 million as the Authority required more overtime, materials and services to keep the airport open and safe due to 60 inches of snowfall in FY18 versus 48 inches in FY17. Expenses were also higher by $2.8 million for remediation work required on the old Air Traffic Control tower and other assets at Logan Airport slated for demolition or renovation. Miscellaneous expenses were up $4.6 million due primarily to Logan Terminal B and C roadway work, training of a new State Police class, and a one-time asset write down of $0.7 million for Logan Airport Hangar 16.

Logan Airport Operations and Maintenance Expenses – FY 2017

Operations and maintenance expenses for Logan Airport in fiscal year 2017 were $257.8 million and accounted for approximately 94% of all aviation operations and maintenance expenses and 74% of the Authority's total operations and maintenance expenses. They increased by $12.7 million, or 5.2% over the prior year.

Increased business activity resulted in a $2.6 million cost increase for items including shuttle bus operations, ground transportation staff, terminal building cleaning and credit card processing fees. Airfield and structural repairs and maintenance resulted in a $2.8 million increase, and utility expenses increased by $2.6 million. Payroll expense was higher by $2.5 million and security-related costs increased by $2.1 million.

Hanscom Field and Worcester Airport Operations and Maintenance Expenses – FY 2018

In fiscal year 2018, operations and maintenance expenses for Hanscom Field were $11.8 million, an increase of $1.6 million or 15.7% over the prior year. The majority of the increase was due to $1.0 million for property repairs related to flooding from the July 13, 2017 rain storm, and most of this expense is being recovered through an insurance claim. The remaining $0.5 million increase was attributable to higher payroll and benefits expense.

Operations and maintenance expenses for Worcester Regional Airport were $7.0 million, a $0.5 million or 7.7% increase. Contributors to the expense increase included $0.2 million for higher payroll and benefits expense, $0.1 million for higher utility costs, and $0.2 million for additional materials, supplies and other miscellaneous expenses.

Hanscom Field and Worcester Airport Operations and Maintenance Expenses – FY 2017

In fiscal year 2017, operations and maintenance expenses for Hanscom Field were $10.2 million, an increase of $0.9 million or 10.7% over the prior year. The increase was due to $1.0 million for environmental remediation expenses related to the demolition of a hangar.

Operations and maintenance expenses for Worcester Regional Airport were $6.5 million, a decrease of $0.2 million or 4.2% due primarily to lower equipment rental expense of $0.2 million as fire rescue equipment that was rented in fiscal year 2016 was replaced with purchased equipment in fiscal year 2017.

Maritime Operations and Maintenance Expenses – FY 2018

Maritime operations and maintenance expenses were $64.0 million, $4.4 million or 7.4% higher than the prior year. Higher business activity resulted in a $3.2 million increase in expenses, $2.9 million of which was for stevedoring container handling costs to support the 10.4% increase in container volume while the remainder was for overtime required to support record container and cruise activity. Other increases included $0.6 million for higher weather-related expenses due to 60 inches of snow in FY18 versus 48 inches in FY17, an increase of $0.5 million for utility expenses due to higher electricity costs, and payroll and benefits expense of $0.3 million.

Maritime Operations and Maintenance Expenses – FY 2017

Maritime operations and maintenance expenses in FY2017 were $59.6 million, $6.2 million or 11.6% higher than the prior year. Maritime incurred an additional $2.5 million of stevedoring expense driven by the 3.9% increase in TEUs coupled with additional weekend container ship visits causing higher stevedoring pay. Other increases included $1.5 million for the Sail Boston event for overtime, security screening, equipment rental and other expenses, $0.9 million for maintenance improvements to the Flynn Cruiseport, $0.7 million for additional services related to equipment maintenance and snow removal, and higher payroll and benefits expense of $0.4 million.

Real Estate Operations and Maintenance Expenses – FY 2018

Real Estate operations and maintenance costs in fiscal year 2018 were $14.9 million, up by $1.7 million or 12.9% versus the prior year. Repair expenses were up by $0.6 million due to damages to the pier at 88 Black Falcon caused by a container ship that broke free from Conley Terminal in a storm. The Authority has filed an insurance claim to recoup these costs. Professional fees increased by $0.4 million for engineering and legal resources to help advance the development of several parcels of land. The Authority incurred a $0.3 million asset write off as part of a parcel development, and payroll and benefits expenses were higher by $0.3 million.

Real Estate Operations and Maintenance Expenses – FY 2017

Real Estate operations and maintenance costs in fiscal year 2017 were $13.2 million, up by $1.3 million or 10.9% versus the prior year. The increase was due to higher security costs of $0.3 million for state police growth in the Seaport District, higher payroll and benefits expense of $0.2 million, $0.4 million for repairs related to roadway surfaces and higher public affairs expense for special events, and $0.1 million for increased utilities costs.

General and Administrative Expenses – FY 2018

The Authority's general and administrative costs were $62.5 million in fiscal year 2018, $3.1 million or 5.2% higher than fiscal year 2017. The drivers of the increase include additional payroll costs for administrative employees of $1.7 million primarily for merit based pay increases as new hiring was minimal, and a $0.4 million increase in materials and supplies expense mainly related to computers and copy machines.

The following table shows the allocation of the Authority's general and administrative expenses by business line for fiscal years 2018, 2017 and 2016.

General and Administrative Expenses
($ millions)

	FY 2018	FY 2017 (Restated)	FY 2016
Logan	$ 43.6	$ 42.5	$ 42.3
Hanscom	2.3	2.1	1.9
Worcester	2.8	2.3	2.0
Maritime	8.5	8.1	8.2
Real Estate	5.3	4.4	3.8
Total	**$ 62.5**	**$ 59.4**	**$ 58.2**

General and Administrative Expenses – FY 2017

The Authority's restated FY2017 general and administrative costs were $59.4 million, $1.2 million or 2.1% higher than fiscal year 2016. The GASB 75 restatement related to health care benefits resulted in an expense increase of $0.3 million over FY2016. Payroll costs for administrative employees were higher by $1.6 million for merit based pay increases, and benefits expense was up by $0.5 million. These increases were partially offset by a $1.3 million decrease in Airline Business Incentive Program expenses due primarily to the completion of incentive programs for Turkish Airlines and Emirates Airlines in fiscal year 2016.

PILOT, Pension & OPEB and Other Expenses – FY 2018

In fiscal year 2018, the Authority's PILOT payments to the City of Boston and the Town of Winthrop totaled $20.4 million and reflect a $1.1 million or 5.7% increase versus fiscal year 2017. The City of Boston's PILOT payments are contractually linked to the annual rise in the Consumer Price Index (CPI), which added $0.4 million of new costs. The remainder of the increase is related to community mitigation payments to organizations such as the East Boston Foundation for new facilities being constructed at Logan Airport.

The Authority's expenses for pension and OPEB were $29.0 million, a decrease of $9.9 million or 25.4% compared to fiscal year 2017. The Authority's pension expense decreased by $10.9 million, primarily due to a 16.51% favorable net return on pension plan assets versus the 7.25% rate used to project the pension liability. The Authority's OPEB expense increased by $1.0 million due to a 7.59% favorable net return on the OPEB assets versus the 7.25% rate used to project the OPEB liability net of amortization of prior year losses. The investment return on the pension assets was higher than the return for the OPEB assets as the measurement period for the pension assets was calendar year ended December 31, 2017, while the measurement period for OPEB was fiscal year ended June 30, 2017.

The following table shows the allocation of PILOT, Pension, OPEB, and other expenses by business line for fiscal years 2018 and 2017.

FY18 - PILOT, Pension, OPEB, and Other Expenses
($ millions)

	PILOT	PENSION	OPEB	OTHER	TOTAL
Logan	$ 18.2	$ 7.0	$ 15.9	$ 5.8	$ 46.9
Hanscom	0.0	0.3	0.6	0.3	1.2
Worcester	0.0	0.3	0.4	0.2	0.9
Maritime	1.3	0.8	2.4	1.8	6.3
Real Estate	0.9	0.4	0.9	0.3	2.5
Total	**$ 20.4**	**$ 8.8**	**$ 20.2**	**$ 8.4**	**$ 57.8**

FY17 - PILOT, Pension, OPEB, and Other Expenses
($ millions)

	PILOT	PENSION	OPEB (Restated)	OTHER	TOTAL
Logan	$ 17.2	$ 15.6	$ 15.1	$ 7.4	$ 55.3
Hanscom	0.0	0.6	0.6	0.2	1.4
Worcester	0.0	0.7	0.3	0.2	1.2
Maritime	1.3	1.9	2.4	1.6	7.2
Real Estate	0.8	0.9	0.8	0.2	2.7
Total	**$ 19.3**	**$ 19.7**	**$ 19.2**	**$ 9.6**	**$ 67.8**

PILOT, Pension & OPEB and Other Expenses – FY 2017

In fiscal year 2017, the Authority's PILOT payments to the City of Boston and the Town of Winthrop totaled $19.3 million and reflect a 0.5% or $0.1 million decrease versus fiscal year 2016. The decrease reflects the end of a 10-year agreement that required the Authority to pay a $0.7 million per year supplemental payment to the City of Boston from FY07 through FY16. The City of Boston's PILOT payments are contractually linked to the CPI, which added $0.4 million of new costs, and also incorporate an agreement for mitigation payments to the East Boston Foundation for new facilities being constructed at Logan Airport. The amount of these mitigation payments increased by $250,000 in fiscal year 2017.

The Authority's expenses for pension and OPEB were $38.9 million, an increase of $9.2 million or 31.0% compared to fiscal year 2016. The Authority's net pension liability increased $33.4 million, primarily due to a reduction in the plan's discount rate resulting in a $4.1 million pension expense increase in FY2017. The Authority's OPEB expense increased by $5.1 million due to revisions to the mortality tables used in calculating benefits and the addition of approximately 100 beneficiaries previously omitted from the prior year's actuarial OPEB valuation.

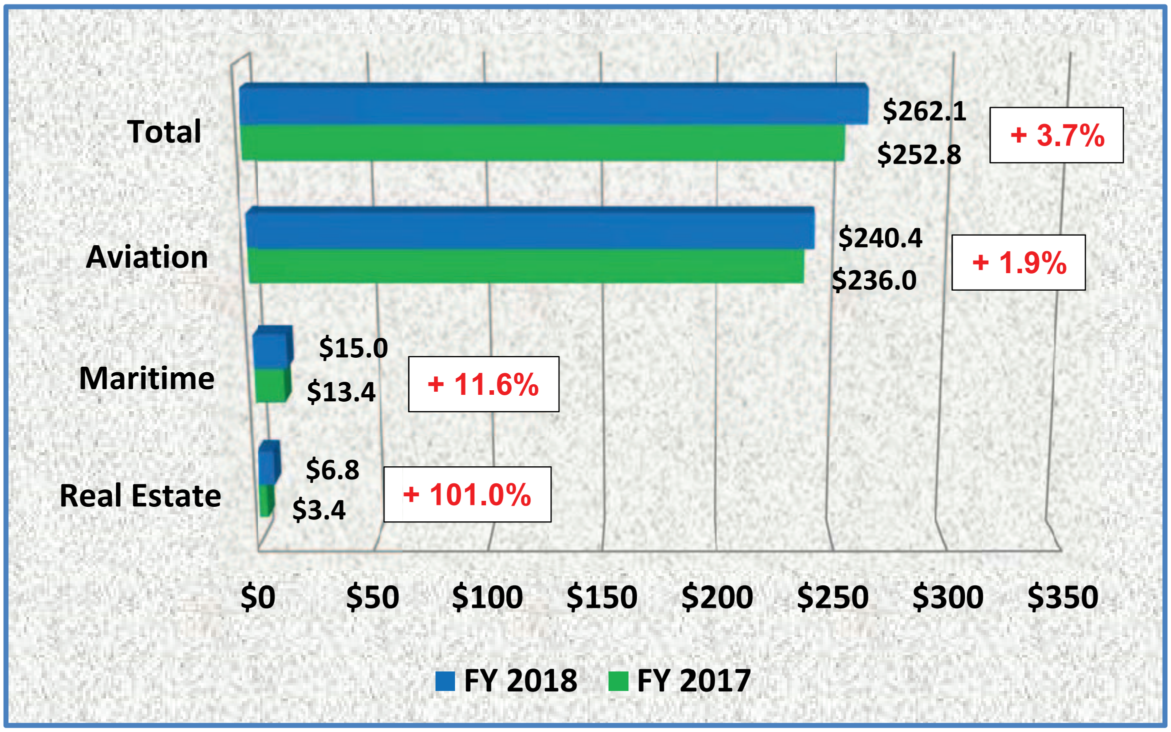
Please see Note 6 (Pension Plan), Note 7 (OPEB) and Note 10 (PILOT) in the attached financial statements.

Depreciation and Amortization Expenses – FY 2018

The Authority recognized $262.1 million in depreciation and amortization expenses in fiscal year 2018, an increase of $9.3 million or 3.7% compared to fiscal year 2017. This increase is the result of $294.3 million in new assets being placed into service. During fiscal year 2018, the Authority completed and placed into service assets in the Real Estate business unit including the South Boston Waterfront Transportation Center at a cost of $84.4 million, assets in the Maritime unit including the Conley Terminal Dedicated Freight Corridor at a cost of $36.8 million, and assets in the Aviation unit including the CAT III Instrument Landing System at

Worcester Airport at a cost of $30.2 million and modifications to Gates 37 and 38 at Logan Airport at a cost of $19.4 million. These amounts represent the amount of capital actually placed into service and not necessarily the total project cost.

Depreciation and Amortization Expense
($ millions)



<u>Depreciation and Amortization Expenses – FY 2017</u>

The Authority recognized $252.8 million in depreciation and amortization expenses in fiscal year 2017, an increase of $5.3 million or 2.1% compared to fiscal year 2016. This increase is the result of $384.9 million in new assets being placed into service. During fiscal year 2017, the Authority completed and placed into service projects including the Logan Airport Terminal E Renovation and Enhancement at a cost of $155.8 million, the final portion of the Checked Baggage Inspection System (CBIS) at Logan Airport at a cost of $52.2 million, phase two of the Heating, Ventilation and Air Conditioning (HVAC) system replacement at Logan Airport Terminals B, C and E at a cost of $14.8 million, and the Rehabilitation of Runway 4L/22R at Logan Airport at a cost of $14.7 million.

NON-OPERATING REVENUES (EXPENSES) AND CAPITAL CONTRIBUTIONS

The Authority recognized a net $51.9 million in non-operating revenues in fiscal year 2018, an increase of $8.8 million, or 20.4%, over fiscal year 2017. Non-operating revenues in fiscal year 2017 were $43.1 million, an increase of $4.6 million or 11.9% over the $38.5 million recognized in fiscal year 2016.

Non-operating Revenues and Expenses and Capital Contributions
($ millions)

	FY 2018	FY 2017	$ Change	% Change
Passenger facility charges	$ 81.0	$ 76.3	$ 4.7	6.2%
Customer facility charges	33.0	33.1	(0.1)	-0.3%
Investment income	18.6	13.1	5.5	42.0%
Other income (expense), net	(1.0)	(0.3)	(0.7)	233.3%
Terminal A debt service contributions	(12.2)	(11.9)	(0.3)	2.5%
Interest expense	(67.5)	(67.2)	(0.3)	0.4%
Total Non-operating Revenues (Expenses)	**$ 51.9**	**$ 43.1**	**$ 8.8**	**20.4%**
Capital Contributions	**$ 25.4**	**$ 12.6**	**$ 12.8**	**101.6%**

	FY 2017	FY 2016	$ Change	% Change
Passenger facility charges	$ 76.3	$ 70.7	$ 5.6	7.9%
Customer facility charges	33.1	32.3	0.8	2.5%
Investment income	13.1	9.5	3.6	37.9%
Other income (expense), net	(0.3)	1.5	(1.8)	-120.0%
Terminal A debt service contributions	(11.9)	(11.9)	0.0	0.0%
Interest expense	(67.2)	(63.6)	(3.6)	5.7%
Total Non-operating Revenues (Expenses)	**$ 43.1**	**$ 38.5**	**$ 4.6**	**11.9%**
Capital Contributions	**$ 12.6**	**$ 56.0**	**($ 43.4)**	**-77.5%**

For fiscal year 2018, PFCs were $81.0 million, a $4.7 million or 6.2% increase over the prior year due to increased passenger activity at Logan Airport. Revenues from CFCs totaled $33.0 million, basically flat versus prior year as rental car transaction days at Logan Airport's Rental Car Center were relatively constant with prior year. The Authority also generated $18.6 million of investment income, an increase of $5.5 million due to higher interest rates on fixed income investments and an increase in the Authority's cash balance available for investment. Other expense was $1.0 million, which was $0.7 million higher than prior year due to miscellaneous items including settlement claims, gains or losses on short term investments and gains or losses on sale of equipment. The Authority made a voluntary contribution of

$12.2 million in PFCs to the Terminal A debt service fund to help reduce terminal rental rates, which was slightly higher than the contribution made in the prior year. Interest expense on long term debt was $67.5 million, which was $0.3 million or 0.4% higher than fiscal year 2017.

For fiscal year 2017, PFCs were $76.3 million, a $5.6 million or 7.9% increase over the prior year due to increased passenger activity at Logan Airport. Revenues from CFCs totaled $33.1 million, $0.8 million higher than the prior year due to a 2.0% increase in rental car transaction days at Logan Airport's Rental Car Center. The Authority also generated $13.1 million of investment income, an increase of $3.6 million due to higher interest rates on fixed income investments and an increase in the Authority's cash balance available for investment. Other income (expense), which is comprised of settlement claims, gains or losses on short term investments, gains or losses on the sale of equipment, and any other Authority income, was ($0.3) million, a decrease of $1.8 million due in part to a decrease in the fair market value on its investments as higher interest rates reduced bond prices. The Authority also made a voluntary contribution of $11.9 million in PFCs to the Terminal A debt service fund to help reduce terminal rental rates, which was comparable to the contribution made in the prior year. Interest expense on long term debt was $67.2 million, which was $3.6 million or 5.7% higher than fiscal year 2016.

Capital Contributions

The majority of the Authority's capital contributions are grants awarded by the Federal Aviation Administration (FAA) and by the Maritime Administration (MARAD) unit of the United States Department of Transportation. The FAA grants are for the Airport Improvement Program (AIP) to construct runways, taxiways, apron lighting, residential sound proofing projects, and other capital related projects, primarily at Logan Airport. The MARAD grant is a FASTLANE grant that is being used to improve Conley Terminal. The Authority also receives capital contributions from the Department of Homeland Security, as well as grants from the Federal Emergency Management Administration, the Environmental Protection Agency and the Massachusetts Executive Office of Public Safety and Security related to the State Homeland Security Program, which safeguards the Airport and Port of Boston.

Capital contributions in fiscal year 2018 were $25.4 million, an increase of $12.8 million versus the prior year. The major components of the 2018 revenues were from the FAA AIP grant program for project expenditures related to runway rehabilitation and improvements at Logan Airport and the CAT III ILS project at Worcester Regional Airport, and from MARAD for the rehabilitation of Conley Terminal Berths 11 and 12 and the replacement of RTG (Rubber Tired Gantry) drives. The $12.8 million increase versus last year was primarily due to $10.2 million of MARAD FASTLANE grant funding, which began in FY 2018, and $2.3 million of additional FAA AIP funding versus the prior year.

The majority of the $12.6 million of fiscal year 2017 revenues were from the FAA AIP grant program for project expenditures related to runway rehabilitation and improvements at Logan Airport and the CAT III ILS project at Worcester Regional Airport. The $43.4 million decline versus the prior year was primarily due to the CBIS project as the Authority received $37.8 million of Transportation Security Administration (TSA) reimbursements for this project in fiscal year 2016 versus no reimbursements in fiscal year 2017 as that project was completed.

THE AUTHORITY'S STATEMENTS OF NET POSITION

The Statements of Net Position present the financial position of the Authority at the end of each fiscal year. The Statements include all assets, deferred outflows of resources, liabilities and deferred inflows of resources of the Authority. Net Position is the difference between total assets plus deferred outflows of resources less total liabilities and deferred inflows of resources and is an indicator of the current fiscal health of the Authority. A summarized comparison of the Authority's assets, deferred outflows of resources, liabilities, deferred inflows of resources and net position at June 30, 2018, 2017 and 2016 is as follows:

Condensed Statements of Net Position for FY 2018 and FY 2017
($ millions)

	FY 2018	FY 2017 (Restated)	$ Change	% Change
Assets				
Current assets	$ 948.4	$ 803.9	$ 144.5	18.0%
Capital assets, net	3,216.3	3,142.5	73.8	2.3%
Other non-current assets	402.6	420.1	(17.5)	-4.2%
Total Assets	**4,567.3**	**4,366.5**	**200.8**	**4.6%**
Deferred Outflows of Resources				
Deferred loss on refunding of bonds	16.2	18.0	(1.8)	-10.0%
Deferred outflows of resources related to Pension plan	13.9	37.3	(23.4)	-62.7%
Deferred outflows of resources related to OPEB	29.0	37.7	(8.7)	-23.1%
Total Deferred Outflows of Resources	**59.1**	**93.0**	**(33.9)**	**-36.5%**
Liabilities				
Current liabilities	$ 360.6	$ 308.0	$ 52.6	17.1%
Bonds payable, including current portion	1,835.3	1,850.7	(15.4)	-0.8%
Other non-current liabilities	233.8	285.9	(52.1)	-18.2%
Total Liabilities	**2,429.7**	**2,444.6**	**(14.9)**	**-0.6%**
Deferred Inflows of Resources				
Deferred gain on refunding of bonds	6.1	6.8	(0.7)	-10.3%
Deferred inflows of resources related to Pension plan	25.4	0.0	25.4	100.0%
Deferred inflows of resources related to OPEB	0.8	0.0	0.8	100.0%
Total Deferred Inflows of Resources	**32.3**	**6.8**	**25.5**	**375.0%**
Total Net Position	**$ 2,164.3**	**$ 2,008.1**	**$ 156.2**	**7.8%**

Column totals might not add due to rounding.

The Authority ended fiscal year 2018 with total assets of $4,567.3 million, an increase of $200.8 million or 4.6% over the prior year. This increase is primarily due to growth in current assets due to higher investment balances from bond proceeds and additional income from FY18 operations. Deferred outflows of resources for fiscal year 2018 were $59.1 million, a $33.9 million decrease from the previous year due to a reduction in the deferred outflows on the OPEB and Pension Plan investments from favorable investment gains on plan assets and less amortization of prior year losses. The Authority's total assets consist primarily of capital assets, net, which represent approximately $3,216.3 million or 69.5% of the Authority's total assets and deferred outflows of resources as of June 30, 2018.

The Authority's total liabilities as of June 30, 2018 were $2,429.7 million, a decrease of $14.9 million or 0.6% due mainly to the decline in the Authority's pension and OPEB liabilities due to favorable investment returns. The Authority's liabilities consist primarily of bonds payable (including current portion), which accounted for 74.5% of the Authority's total liabilities and deferred inflows at June 30, 2018.

The Authority's total net position for fiscal year 2018 was $2,164.3 million, a $156.2 million or 7.8% increase over the prior year. This increase reflects the Authority's net operating income of $78.9 million, net non-operating income of $51.9 million and capital contributions of $25.4 million. The growth in net position will be used to fund the Authority's strategic initiatives.

Condensed Statements of Net Position for FY 2017 and FY 2016
($ millions)

	FY 2017 (Restated)	FY 2016	$ Change	% Change
Assets				
Current assets	$ 803.9	$ 632.3	$ 171.6	27.1%
Capital assets, net	3,142.5	3,086.9	55.6	1.8%
Other non-current assets	420.1	496.7	(76.6)	-15.4%
Total Assets	**4,366.5**	**4,215.9**	**150.6**	**3.6%**
Deferred Outflows of Resources				
Deferred loss on refunding of bonds	18.0	17.9	0.1	0.6%
Deferred outflows of resources related to Pension plan	37.3	47.0	(9.7)	-20.6%
Deferred outflows of resources related to OPEB	37.7	0.0	37.7	100.0%
Total Deferred Outflows of Resources	**93.0**	**64.9**	**28.1**	**43.3%**
Liabilities				
Current liabilities	$ 308.0	$ 331.9	($ 23.9)	-7.2%
Bonds payable, including current portion	1,850.7	1,724.5	126.2	7.3%
Other non-current liabilities	285.9	132.4	153.5	115.9%
Total Liabilities	**2,444.6**	**2,188.8**	**255.8**	**11.7%**
Deferred Inflows of Resources				
Deferred gain on refunding of bonds	6.8	8.1	(1.3)	-16.0%
Total Deferred Inflows of Resources	**6.8**	**8.1**	**(1.3)**	**-16.0%**
Total Net Position	**$ 2,008.1**	**$ 2,083.9**	**($ 75.8)**	**-3.6%**

The Authority ended fiscal year 2017 with total assets of $4,366.5 million, an increase of $150.6 million or 3.6% over the prior year. This increase was primarily due to growth in current assets due to higher investment balances. Deferred outflows of resources for fiscal year 2017 were $93.0 million, a $28.1 million increase from the previous year due primarily to the recording of the $37.7 million deferred outflow of resources related to OPEB as required by GASB 75. The Authority's total assets consist primarily of capital assets, which represent approximately $3,142.5 million or 70.5% of the Authority's total assets and deferred outflows of resources as of June 30, 2017.

The Authority's total liabilities as of June 30, 2017 were $2,444.6 million, an increase of $255.8 million or 11.7% due mainly to the growth in the Authority's debt to finance strategic initiatives and the reporting for the first time of the net OPEB liability as required by GASB 75. The Authority's liabilities consist primarily of bonds payable (including current portion), which accounted for 75.5% of the Authority's total liabilities and deferred inflows at June 30, 2017.

The Authority's total net position for fiscal year 2017 was $2,008.1 million, a $75.8 million or 3.6% decrease compared to the prior year. This decrease reflects the impact of GASB 75 of $165.1 million partially offset by net operating income of $33.6 million, net non-operating income of $43.1 million and capital contributions of $12.6 million. The growth in net position will be used to fund the Authority's strategic initiatives.

CAPITAL ASSETS AND DEBT ADMINISTRATION

Capital Assets

As of June 30, 2018 and 2017, the Authority had $3,216.3 million and $3,142.5 million of capital assets (net of depreciation), respectively. These include land, construction in process, buildings, runways, roadways, machinery and equipment, air rights and parking rights. The Authority's net capital assets increased by $73.8 million or 2.3% in fiscal year 2018 primarily as the result of $337.3 million in capital expenditures partially offset by $262.1 million of depreciation expense.

In fiscal year 2018, the Authority placed $294.3 million of new assets into service. Major projects included the South Boston Waterfront Transportation Center which includes 1,550 parking spaces and other transportation amenities at a cost of $84.4 million, the Conley Terminal Dedicated Freight Corridor at a cost of $36.8 million, the CAT III Instrument Landing System at Worcester Airport to enable aircraft to land at that airport in poor visibility conditions at a cost of $30.2 million, and modifications to Gates 37 and 38 at Logan Airport at a cost of $19.4 million.

The Authority placed $384.9 million of assets into service for completed capital projects during fiscal year 2017. Major projects included the Logan Airport Terminal E Renovation and Enhancement at a cost of $155.8 million and the final component of the new Checked Baggage Inspection System (CBIS) at a cost of $52.2 million. Other assets placed into service in fiscal year 2017 included a new Heating, Ventilation and Air Conditioning (HVAC) system for Terminals B, C, and E at Logan Airport at a costs of $14.8 million and the rehabilitation of Runway 4L/22R at Logan Airport at a cost of $14.7 million.

Capital assets, net comprised approximately 69.5%, 70.5% and 72.1% of the Authority's total assets and deferred outflows of resources at June 30, 2018, 2017 and 2016, respectively. During fiscal years 2018, 2017 and, 2016, the Authority spent approximately $293.2 million, $322.7 million and $351.0 million, respectively, constructing new assets and improving existing assets already in service, inclusive of construction in process.

The Authority's capital assets are principally funded by the proceeds of revenue bonds, Authority generated revenues, PFCs, CFCs, and federal and state grants. The Authority's aviation facilities account for approximately 90% of all capital assets. The following chart provides a breakdown of total capital assets at June 30 2018, 2017 and 2016.

Capital Assets by Type
($ thousands)

	FY 2018	FY 2017	FY 2016	% Change 2018-2017	% Change 2017-2016
Land	$ 230,600	$ 230,593	$ 226,497	0.0%	1.8%
Construction in progress	192,782	149,730	225,930	28.8%	-33.7%
Buildings	1,727,729	1,727,657	1,594,212	0.0%	8.4%
Runways and other pavings	389,082	364,152	356,538	6.8%	2.1%
Roadways	345,881	327,839	351,920	5.5%	-6.8%
Machinery and equipment	258,063	262,306	243,958	-1.6%	7.5%
Air rights	52,143	58,628	64,711	-11.1%	-9.4%
Parking rights	20,047	21,588	23,131	-7.1%	-6.7%
Capital assets, net	**$ 3,216,327**	**$ 3,142,493**	**$ 3,086,897**	**2.3%**	**1.8%**

Please see Note 4, Capital Assets in the attached financial statements.

Debt Administration

The Authority's bond sales must be approved by the Members of the Authority (the "Board") and must comply with the rules and regulations of the United States Treasury Department. The Authority, through its 1978 Trust Agreement, has a covenant to maintain a debt service coverage ratio of not less than 1.25. Debt service coverage is calculated based on a formula set forth in the 1978 Trust Agreement. Historically, the Authority has maintained a debt service coverage ratio higher than its 1978 Trust Agreement requirement to maintain its high investment grade bond ratings and keep capital costs low. As of June 30, 2018, 2017, and 2016, the Authority's debt service coverage under the 1978 Trust Agreement was 3.43, 3.27 and 2.98 respectively.

The 1999 PFC Trust Agreement requires a First Lien Sufficiency covenant ratio in excess of 1.05. There was no PFC debt as of June 30, 2018 as all debt was paid off on July 3, 2017. As of June 30, 2017 and 2016, the Authority's PFC First Lien Sufficiency covenant under the PFC Trust Agreement was 63.44 and 10.68 respectively. The ratio was much higher as of June 30, 2017 because the Authority's remaining long term PFC debt was paid off in full on July 3, 2017.

The CFC Trust Agreement requires that the Authority maintain a debt service coverage ratio of at least 1.30. As of June 30, 2018, 2017, and 2016, the CFC debt service coverage ratio was 2.65, 2.60 and 2.50 respectively.

The Authority had net bonds payable outstanding as of June 30, 2018 in the amount of $1,684.0 million, a net decrease of $34.8 million compared to fiscal year 2017. During fiscal year 2018, the Authority issued $169.5 million of Massachusetts Port Authority Revenue Bonds Series 2017-A with an original issue premium of $27.2 million. Approximately $91.4 million of the proceeds from the Series 2017-A Bonds was used to refund the entire outstanding balances of the Authority's 2007 Series C and 2010 Series D bonds, resulting in a net present value benefit to the Authority of $2.8 million. The remaining $91.0 million of Series 2017-A proceeds is being used to finance capital improvements, with the primary project being the consolidation and optimization of Terminal B at Logan Airport. Due to the "private activity" nature of the construction projects, the bonds were sold as Alternative Minimum Tax (AMT) bonds.

The Authority had net bonds payable outstanding as of June 30, 2017 in the amount of $1,718.8 million, a net increase of $93.3 million compared to fiscal year 2016. During fiscal year 2017, the Authority issued $230.3 million of Massachusetts Port Authority Revenue Bonds in two series. The proceeds from the Series 2016 A Revenue Refunding Bonds, in the principal amount of $50.0 million, were used to refund a portion of the outstanding balance of the Authority's 2007 Series A bonds and the entire outstanding balance of the Authority's 2008 Series A bonds, resulting in a net present value benefit to the Authority of $6.8 million. The Series 2016 B Revenue Bonds were issued in the amount of $180.3 million and were used to finance capital improvements, including renovations and enhancements to Terminal E and the consolidation of Terminal B. Due to the "private activity" nature of the construction projects, they were sold as Alternative Minimum Tax (AMT) bonds.

The Official Statements relating to the Authority's Bond issuances are available from the Authority or by accessing the Authority's website.

Please see Note 5, Bonds and Notes Payable in the attached Financial Statements.

THE AUTHORITY'S CONDENSED CASH FLOWS

The following summary shows the major sources and uses of cash during the following fiscal years:

Statements of Cash Flows
($ millions)

	FY 2018	FY 2017	$ Change	% Change
Net cash provided by operating activities	$ 334.0	$ 315.1	$ 18.9	6.0%
Net cash (used in) capital and related financing activities	(228.1)	(164.3)	(63.8)	38.8%
Net cash (used in) investing activities	(166.3)	(128.3)	(38.0)	29.6%
Net (decrease)/increase in cash and cash equivalents	(60.4)	22.5	(82.9)	-368.4%
Cash and cash equivalents, beginning of year	273.0	250.5	22.5	9.0%
Cash and cash equivalents, end of year	**$ 212.6**	**$ 273.0**	**($ 60.4)**	**-22.1%**

	FY 2017	FY 2016	$ Change	% Change
Net cash provided by operating activities	$ 315.1	$ 280.7	$ 34.4	12.3%
Net cash (used in) capital and related financing activities	(164.3)	(318.3)	154.0	-48.4%
Net cash (used in) investing activities	(128.3)	(125.1)	(3.2)	2.6%
Net (decrease)/increase in cash and cash equivalents	22.5	(162.7)	185.2	-113.8%
Cash and cash equivalents, beginning of year	250.5	413.2	(162.7)	-39.4%
Cash and cash equivalents, end of year	**$ 273.0**	**$ 250.5**	**$ 22.5**	**9.0%**

The Authority's cash and cash equivalents at June 30, 2018 was $212.6 million, a decrease of $60.4 million, or 22.1% from the $273.0 million in cash and cash equivalents reported in fiscal year 2017. The Authority generated $334.0 million in cash from operations during fiscal year 2018 compared to $315.1 million in the prior year, an increase of $18.9 million, or 6.0%, primarily from increased business activity at Logan Airport, record container volumes at Conley Terminal, and activity at its other facilities. The Authority used $228.1 million in cash for capital and related financing activities to finance the Authority's capital program and to pay debt service expenses during the year. This was a $63.8 million increase in the use of cash from the $164.3 million in cash used for capital and related financing activities in fiscal year 2017 due mainly to lower proceeds from the issuance of bonds, net. The Authority used $166.3 million in cash from investments towards its capital and operating needs, an increase of $38.0 million from the amount of cash used for investing activities in fiscal year 2017.

The Authority's cash and cash equivalents at June 30, 2017 was $273.0 million, an increase of $22.5 million, or 9.0% from the $250.5 million in cash and cash equivalents reported in fiscal year 2016. The Authority generated $315.1 million in cash from operations during fiscal year 2017 compared to $280.7 million in the prior year, an increase of $34.4 million, or 12.3%, primarily from increased business activity at Logan Airport, record container volumes at Conley Terminal, and activity at its other facilities. The Authority used $164.3 million in cash for capital and related financing activities to finance the Authority's capital program and to pay debt service expenses during the year. This was a $154.0 million decrease in the use of cash from the $318.3 million in cash used for capital and related financing activities in fiscal year 2016, which included a debt refunding payment. The Authority used $128.3 million in cash from investments towards its capital and operating needs, an increase of $3.2 million from the amount of cash used for investing activities in fiscal year 2016.

Contacting the Authority's Financial Management

For additional information concerning the Authority and the Retirement System, please see the Authority's website, www.massport.com. Financial information can be found by clicking on "Finance". The Authority's executive offices are located at One Harborside Drive, Suite 200S, East Boston, Massachusetts 02128, and the main telephone number is (617) 568-5000. Questions may be directed to John P. Pranckevicius, CPA, Director of Administration and Finance, and Secretary-Treasurer for the Massachusetts Port Authority.

MASSACHUSETTS PORT AUTHORITY

Statements of Net Position

June 30, 2018 and 2017

(In thousands)

	2018	2017 (Restated)
Current assets:		
Cash and cash equivalents	$ 73,299	$ 82,095
Investments	170,039	132,021
Restricted cash and cash equivalents	139,285	190,914
Restricted investments	478,519	317,441
Accounts receivable		
Trade, net	68,085	67,630
Grants receivable	9,948	5,811
Total receivables (net)	78,033	73,441
Prepaid expenses and other assets	9,171	7,964
Total current assets	948,346	803,876
Noncurrent assets:		
Investments	132,105	152,661
Restricted investments	261,576	259,040
Prepaid expenses and other assets	5,796	5,637
Investment in joint venture	3,130	2,843
Capital assets-not being depreciated	423,382	380,323
Capital assets-being depreciated-net	2,792,945	2,762,170
Total noncurrent assets	3,618,934	3,562,674
Total assets	4,567,280	4,366,550
Deferred outflows of resources		
Deferred loss on refunding of bonds	16,243	17,983
Deferred outflows of resources related to pensions	13,869	37,298
Deferred outflows of resources related to OPEB	28,974	37,729
Total deferred outflows of resources	59,086	93,010
Current liabilities:		
Accounts payable and accrued expenses	160,488	133,949
Compensated absences	1,327	1,400
Contract retainage	6,022	8,729
Current portion of long term debt	62,951	123,000
Commercial notes payable	142,000	109,000
Accrued interest on bonds payable	40,552	39,015
Unearned revenues	10,185	15,939
Total current liabilities	423,525	431,032
Noncurrent liabilities:		
Accrued expenses	11,300	14,621
Compensated absences	17,566	17,908
Net pension liability	34,927	88,322
Net OPEB liability	143,858	150,451
Contract retainage	5,778	1,236
Long-term debt, net	1,772,365	1,727,665
Unearned revenues	20,419	13,374
Total noncurrent liabilities	2,006,213	2,013,577
Total liabilities	2,429,738	2,444,609
Deferred inflows of resources		
Deferred gain on refunding of bonds	6,074	6,809
Deferred inflows of resources related to pensions	25,390	—
Deferred inflows of resources related to OPEB	831	—
Total deferred inflows of resources	32,295	6,809
Net position		
Net investment in capital assets	1,379,079	1,290,338
Restricted		
Bond funds	212,738	209,333
Project funds	271,003	196,738
Passenger facility charges	51,133	102,914
Customer facility charges	67,161	48,550
Other purposes	31,233	28,101
Total restricted	633,268	585,636
Unrestricted	151,986	132,168
Total net position	$ 2,164,333	$ 2,008,142

The accompanying notes are an integral part of these financial statements.

MASSACHUSETTS PORT AUTHORITY

Statements of Revenues, Expenses, and Changes in Net Position

Years ended June 30, 2018 and 2017

(In thousands)

	2018	2017 (Restated)
Operating revenues:		
Aviation rentals	$ 240,798	$ 217,906
Aviation parking	180,803	169,354
Aviation shuttle bus	20,303	19,278
Aviation fees	153,236	145,418
Aviation concessions	114,492	98,913
Aviation operating grants and other	1,911	2,909
Maritime fees, rentals and other	94,351	82,088
Real estate fees, rents and other	30,497	25,037
Total operating revenues	836,391	760,903
Operating expenses:		
Aviation operations and maintenance	296,186	274,506
Maritime operations and maintenance	63,976	59,629
Real estate operations and maintenance	14,852	13,215
General and administrative	62,470	59,342
Payments in lieu of taxes	20,408	19,276
Pension and other post-employment benefits	28,952	38,903
Other	8,449	9,631
Total operating expenses before depreciation and amortization	495,293	474,502
Depreciation and amortization	262,162	252,846
Total operating expenses	757,455	727,348
Operating income	78,936	33,555
Nonoperating revenues and (expenses):		
Passenger facility charges	81,016	76,296
Customer facility charges	33,003	33,055
Investment income	18,577	13,093
Net decrease in the fair value of investments	(4,373)	(4,501)
Other revenues	1,364	4,062
Settlement of claims	2,019	248
Terminal A debt service contribution	(12,232)	(11,941)
Other expenses	(195)	(198)
Gain on sale of equipment / property	182	125
Interest expense	(67,490)	(67,157)
Total nonoperating revenues (expenses), net	51,871	43,082
Increase in net position before capital contributions	130,807	76,637
Capital contributions	25,384	12,635
Increase in net position	156,191	89,272
Net position, beginning of year	2,008,142	1,918,870
Net position, end of year	$ 2,164,333	$ 2,008,142

The accompanying notes are an integral part of these financial statements.

MASSACHUSETTS PORT AUTHORITY

Statements of Cash Flows

Years ended June 30, 2018 and 2017

(In thousands)

	2018	2017 (Restated)
Cash flows from operating activities:		
Cash received from customers and operating grants	$ 833,354	$ 765,757
Payments to vendors	(298,606)	(255,538)
Payments to employees	(165,669)	(161,571)
Payments in lieu of taxes	(19,383)	(19,276)
Other post-employment benefits	(15,682)	(14,300)
Net cash provided by operating activities	334,014	315,072
Cash flows from capital and related financing activities:		
Acquisition and construction of capital assets	(293,228)	(322,735)
Proceeds from the issuance of bonds	196,155	268,866
Principal payments on refunded debt	(94,855)	(63,382)
Interest paid on bonds and notes	(82,151)	(78,220)
Principal payments on long-term debt	(109,425)	(75,240)
Proceeds from commercial paper financing	64,000	9,000
Principal payments on commercial paper	(31,000)	(25,000)
Terminal A debt service contribution	(12,232)	(11,941)
Proceeds from passenger facility charges	79,908	72,039
Proceeds from customer facility charges	32,546	33,059
Proceeds from capital contributions	20,698	28,851
Settlement of claims	1,274	248
Proceeds from sale of equipment	170	178
Net cash used in capital and related financing activities	(228,140)	(164,277)
Cash flows from investing activities:		
Purchases of investments, net	(887,039)	(726,630)
Sales of investments, net	703,791	586,428
Realized (loss)/gain on sale of investments	(20)	(34)
Interest received on investments	16,969	11,987
Net cash used in investing activities	(166,299)	(128,249)
Net increase (decrease) in cash and cash equivalents	(60,425)	22,546
Cash and cash equivalents, beginning of year	273,009	250,463
Cash and cash equivalents, end of year	$ 212,584	$ 273,009
Reconciliation of operating income to net cash provided by operating activities:		
Cash flows from operating activities:		
Operating income	$ 78,936	$ 33,555
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation and amortization	262,162	252,846
Provision for uncollectible accounts	439	1,642
Changes in operating assets and liabilities:		
Trade receivables	406	(4,835)
Prepaid expenses and other assets	3,574	3,481
Accounts payable and accrued expenses	(12,494)	10,657
Net pension liability and deferred inflows/outflows	(4,576)	6,141
Net OPEB liability and deferred inflows/outflows	2,993	3,563
Compensated absences	(415)	(227)
Unearned revenue	2,989	8,249
Net cash provided by operating activities	$ 334,014	$ 315,072
Noncash investing activities:		
Net increase in the fair value of investments	$ (5,666)	$ (1,314)

The accompanying notes are an integral part of these financial statements.

1. Summary of Significant Accounting Policies and Practices

Reporting Entity

The Massachusetts Port Authority (the "Authority") is a body politic and corporate and a public instrumentality of The Commonwealth of Massachusetts (the "Commonwealth") created and existing pursuant to Chapter 465 of the Acts of 1956, as amended, (the "Enabling Act"). The Authority controls, operates and manages Boston-Logan International Airport ("Logan Airport"), Laurence G. Hanscom Field, Worcester Regional Airport, the Port of Boston and other facilities in the Port of Boston.

The Authority has no stockholders or equity holders, and the Authority's financial statements are not a component unit of the Commonwealth's financial statements. The provisions of the Enabling Act and the Trust Agreement, dated as of August 1, 1978 as amended and supplemented (the "1978 Trust Agreement"), between the Authority and U.S. Bank National Association (as successor in interest to State Street Bank and Trust Company), as trustee (the "Trustee"), the Passenger Facility Charges ("PFC") Revenue Bond Trust Agreement dated May 6, 1999, as amended and supplemented (the "PFC Trust Agreement"), between the Authority and The Bank of New York Mellon, as trustee (the "PFC Trustee"), which was superseded by the PFC Depositary Agreement dated July 3, 2017, and the Customer Facility Charges ("CFC") Revenue Bond Trust Agreement dated May 18, 2011, as amended and supplemented (the "CFC Trust Agreement"), between the Authority and U.S. Bank National Association, as trustee (the "CFC Trustee"), govern all funds, with limited exceptions, received by the Authority pursuant to the Enabling Act.

In April 1981, the Authority adopted a retiree benefit plan whereby the Authority assumed the full cost of group health insurance including basic life insurance, dental insurance and catastrophic illness coverage to those retirees and surviving spouses (and qualifying dependents) who have retired under the Authority's retirement system (collectively referred to as the "OPEB Plan"). In June 2009 and May 2016, the Board made changes to the plan benefits to be paid by the Authority for certain existing and future retirees. For additional details, see Note 7.

In June 2008, the Authority created the Retiree Benefits Trust (the "RBT" or the "Trust") to fund its OPEB Plan obligations. It was established as an irrevocable governmental trust under Section 115 of the Internal Revenue Code. In no event shall any part of the principal or income of the RBT be paid or revert back to the Authority or be used for any purpose whatsoever other than for the exclusive benefit of retirees and their beneficiaries.

Basis of Accounting

The Authority's activities are accounted in a manner similar to that often utilized in the private sector. The Authority's financial statements are prepared using the accrual basis of accounting and the economic resources measurement focus in accordance with U.S. generally accepted accounting principles ("GAAP").

Revenues from airlines, rentals, parking fees, tolls and concessions are reported as operating revenues. Capital grants, PFCs, CFCs and financing or investing related transactions are reported as non-operating revenues and expenses. All expenses related to operating the Authority's facilities are reported as operating expenses.

Accounting per Applicable Trust Agreements

Under the 1978 Trust Agreement, cash of the Authority is deposited daily into the Revenue Fund established pursuant to the 1978 Trust Agreement and is transferred to the cash concentration account. All such revenues are then transferred to the various funds established pursuant to the 1978 Trust Agreement. After providing for operating expenses, including pension expense and transfers to the self insurance account, cash revenues are then transferred to the Interest and Sinking Fund, which are applied to debt service on any outstanding revenue bonds, the Maintenance Reserve Fund, the Payment In Lieu of Taxes Fund, the Capital Budget Fund, if applicable, and finally, the Improvement and Extension Fund.

Prior to July 3, 2017, all PFC revenue was deposited in the PFC Pledged Revenue Fund established pursuant to the PFC Trust Agreement and was utilized to pay debt service on PFC Revenue Bonds as required in the PFC Trust Agreement. Any remaining funds were transferred to the PFC Capital Fund. The Authority paid the final maturities of the PFC Revenue Bonds outstanding of $52.9 million on July 3, 2017 and established a new PFC Depositary Agreement with The Bank of New York, Mellon, as custodian (the "PFC Custodian").

CFC revenue is deposited in the CFC Revenue Fund established pursuant to the CFC Trust Agreement and is utilized to pay debt service on CFC Special Facilities Bonds as required in the CFC Trust Agreement. Any remaining funds are transferred to the CFC Stabilization Fund.

See Note 2 for a reconciliation between the increase in net position as calculated per GAAP and net revenues as calculated per accounting practices prescribed by the 1978 Trust Agreement.

a) Net Position

The Authority follows the "business type" activity requirements of GASB Statement No. 34, *Basic Financial Statements and Management's Discussion and Analysis for State and Local Governments*, as amended, which requires that resources be classified for accounting and reporting purposes into the following three net position components:

- Net investment in capital assets: Capital assets, net of accumulated depreciation and outstanding principal balances of debt and the deferred outflows / inflows of resources attributable to the acquisition, construction or improvement of those assets.
- Restricted: Net position of assets whose use by the Authority is subject to externally imposed stipulations that can be fulfilled by actions of the Authority pursuant to those stipulations or that expire by the passage of time. Such assets include the construction funds held pursuant to the 1978 Trust Agreement, the PFC Trust Agreement (which was

superseded by the PFC Depositary Agreement dated July 3, 2017), the CFC Trust Agreement and the self insurance fund.

- Unrestricted: Net position of assets that are not subject to externally imposed stipulations. Net amounts of assets, deferred outflows of resources, liabilities and deferred inflows of resources not included in the determination of net investment in capital assets or restricted components of net position. Unrestricted net position may be designated for specific purposes by action of management or the Members of the Authority (the "Board") or may otherwise be limited by contractual agreements with outside parties. When both restricted and unrestricted resources are available for a particular restricted use, it is the Authority's policy to use restricted resources first, and then unrestricted resources as needed.

b) Deferred outflows/inflows of resources

In addition to assets, the statement of net position reports a separate section for deferred outflows of resources. This separate financial statement element, deferred outflows of resources, represents a consumption of net assets that applies to a future period and so will not be recognized as an outflow of resources (expense) until then. At June 30, 2018 and 2017, the Authority has several items that qualify for reporting in this category. The first deferred outflow results from refunding long term debt and is the difference in the carrying value of refunded debt and its reacquisition price. This amount is deferred and amortized over the shorter of the life of the refunded or refunding debt. The second item is related to the difference in the expected versus actual experience of the Pension Plan and the OPEB Trust. This amount is deferred and amortized over approximately seven years. The third item is related to the change in Pension Plan assumptions, the reduction in the discount rate, which is being amortized over approximately seven years. The fourth item is related to OPEB Trust contributions made subsequent to the measurement date which will reduce the net OPEB liability in fiscal year 2019.

In addition to liabilities, the statement of net position reports a separate section for deferred inflows of resources. This separate financial statement element, deferred inflows of resources, represents an acquisition of net assets that applies to a future period and so will not be recognized as an inflow of resources (revenue) until that time. At June 30, 2018 and 2017, the Authority has two items that qualify for reporting in this category. The first deferred inflow of resources results from refunding long term debt and is the difference in the carrying value of refunded debt and its reacquisition price. This amount is deferred and amortized over the shorter of the life of the refunded or refunding debt. The second item is related to the net deferred gain on Pension Plan and OPEB Trust investments, which is being amortized over a five year period.

c) Cash and Cash Equivalents

For purposes of the statements of cash flows, the Authority considers all highly liquid investments, including restricted assets, with an original maturity date of 30 days or less to be cash equivalents.

d) Investments

Investments with a maturity greater than one year are recorded at their fair value with all investment income, including changes in the fair value of investments, reported as investment income in the financial statements. Investments with a maturity date of less than one year are carried at amortized cost, which approximates fair value. Fair value is determined based on quoted market prices. The Authority recorded to investment income an unrealized decrease in the fair value of investments of $4.4 million and a realized loss of $0.02 million at June 30, 2018 and an unrealized decrease in the fair value of investments of $4.5 million and a realized gain of $0.03 million at June 30, 2017.

e) Restricted Cash and Investments

Certain cash, cash equivalents and investments are restricted for use by the 1978 Trust Agreement, the PFC Depositary Agreement, the CFC Trust Agreement, and other external requirements. These amounts have been designated primarily for expenditures related to future construction or asset acquisitions, debt service and debt service reserves.

f) Capital Assets

Capital assets are recorded at cost and include land, land improvements, buildings, machinery and equipment, runways, roadways and other paving and non-maintenance dredging. Such costs include, where appropriate, capitalized interest and related legal costs. The costs of normal upkeep, maintenance, maintenance dredging and repairs are not capitalized.

The capitalization threshold is noted below:

Asset Category	Dollar Threshold
Buildings	$ 10,000
Machinery & Equipment	5,000
Equipment Repair/Overhaul (Major)	25,000
Runway, Roadways & Other Paving	50,000
Land Improvements	50,000

The Authority capitalizes certain interest costs associated with taxable and tax-exempt borrowing, less any interest earned on the proceeds of those borrowings, during the period of construction. Interest expense of $10.4 million and $8.6 million, reduced by interest income of $537.8 thousand and $282.0 thousand resulted in capitalized interest of $9.9 million and $8.3 million for the years ended June 30, 2018 and 2017, respectively.

g) Depreciation

The Authority provides for depreciation using the straight-line method. Depreciation is intended to distribute the cost of depreciable properties over the following estimated useful lives:

Asset Category	Years
Buildings	25
Runways (original construction)	25
Other airfield paving	12
Roadway	25
Dredging	15
Machinery and equipment	5 to 10

h) Other Assets and Prepaid Items

Other assets consist of certain payments to vendors reflecting costs applicable to future accounting periods and are recorded as prepaid items in the financial statements.

i) Amortization

Revenue bond premiums and discounts are deferred and amortized on a straight-line basis over the term of the bonds, as this approximates the effective interest method. Unamortized amounts are presented as a (reduction) addition of the face amount of bonds payable.

The difference between the reacquisition price and net carrying amount of defeased bonds is amortized on the straight-line method over the shorter of the maturity of the new debt or the defeased debt and is recorded as deferred inflows/outflows of resources on the statement of net position.

j) Revenue Recognition

Fees and other services consist of parking fees, landing fees, and container handling fees. Revenues from parking fees and container handling fees are recognized at the time the service is provided. Landing fees are recognized as part of operating revenue when airline related facilities are utilized and are principally based on the landed weight of the aircraft. The scheduled airline fee structure is determined and approved annually by the Board and is based on full cost recovery pursuant to an arrangement between the Authority and the respective airlines.

Rental and concession fees are generated from airlines, rental car companies, and other commercial tenants. Rental revenue on leases is recognized over the term of the associated lease. Concession revenue is recognized partially based on self-reported concession revenue by the tenants and partially based on minimum rental rates. Unearned revenue consists primarily of amounts received in advance for future rents or other services. These amounts are recognized as revenue as they are earned over the applicable period.

Rates and charges are set annually based on the budgeted operating costs and actual capital costs. A true-up calculation is performed for landing fees, terminal rents, and baggage fees at year-end based on the actual results. In the event the actual costs are more than the budgeted amounts for the year, the Authority will recover additional rates and charges. In the event the actual costs are less than the budgeted amounts, the Authority will issue credits to the respective airlines.

The Authority presents its accounts receivable at the expected net realizable value. Accordingly, the Authority has recorded an allowance for doubtful accounts against its accounts receivable of $4.4 million and $3.5 million at June 30, 2018 and 2017, respectively.

k) Passenger Facility Charges

In 1993, the Authority received initial approval from the Federal Aviation Administration ("FAA") to impose a $3.00 PFC on all outbound tickets purchased at Logan Airport. PFCs collected by the Authority can be used for capital projects determined by the FAA to be eligible in accordance with the Aviation Safety and Capacity Expansion Act of 1990. Effective October 1, 2005, the Authority received approval from the FAA to increase the PFC collection to $4.50. All PFC's collected by the Authority are presently deposited under the PFC Depositary Agreement with The Bank of New York Mellon, as PFC Custodian.

Through June 30, 2018, the Authority had cumulative PFC cash collections of $1,203.1 million, including interest thereon.

As part of the Final Agency Decision issued by the FAA in 2011, the Authority was authorized, but not required, to use up to $14.4 million per year in PFCs to pay approximately one-third of the debt service on the Terminal A Special Facility bonds. The Authority chose to make this use of PFC revenue in order to offset the increase in Terminal A rates and charges that would have resulted from the scheduled increase in Terminal A debt service associated with the beginning of principal payments on January 1, 2012 for the Terminal A bonds. This use of PFCs will maintain the rate consistency across all terminals and facilitate the Authority's ability to assign carriers to Terminal A.

At June 30, 2018, the Authority's collection authorization and total use approval is $1.65 billion.

As of June 30, 2018 and 2017, $0.0 million and $52.9 million of PFC bonds were outstanding, respectively.

Revenues derived from the collection of PFCs are recognized on the accrual basis, based on the month the charges were levied and collected by the airlines. Due to their restricted use, PFCs are categorized as non-operating revenues. The Authority recognized $81.0

million and $76.3 million in PFC revenue for the fiscal years ended June 30, 2018 and 2017, respectively.

l) Customer Facility Charges

Effective December 1, 2008, the Board established a CFC of $4.00 per day for rental cars which originated out of Logan Airport. Effective December 1, 2009, this charge was increased to $6.00 per day. The proceeds of the CFC are being used to finance the Rental Car Center (the "RCC") and associated bus purchases. Revenues derived from the collection of CFCs are recognized on the accrual basis, based on the month the charges were levied and collected by the rental car companies. Due to their restricted use, CFCs are categorized as non-operating revenues. Pursuant to the CFC Trust Agreement, the Authority issued two series of Special Facilities Revenue Bonds in June 2011 (the "Series 2011 Bonds"). The Series 2011 Bonds were issued for the purpose of providing funds sufficient, together with other available funds of the Authority, to finance the development and construction of the RCC and related improvements at Logan Airport, fund certain deposits to the Debt Service Reserve Fund and the Supplemental Reserve Fund, and pay certain costs of issuance of the Series 2011 Bonds. The Series 2011 Bonds and any additional bonds that may be issued under the CFC Trust Agreement on parity with the Series 2011 Bonds are secured by CFC Pledged Revenues and by Contingent Rent, if any, payable by the rental car companies and other funds. The Series 2011 Bonds are not secured by any other revenues of the Authority.

The Authority recognized $33.0 million and $33.1 million in CFC revenue for the fiscal years ended June 30, 2018 and 2017, respectively.

As of June 30, 2018 and 2017, $194.6 million and $198.2 million of CFC bonds were outstanding, respectively.

m) Capital Contributions

The Authority receives capital contributions from various federal agencies and the Commonwealth in support of specific operational programs and its Capital Program. Grant revenues are recognized as related expenditures are incurred and all eligibility requirements are met. Grants for capital asset acquisition, facility development, runway/ airfield rehabilitation and long-term planning are reported as capital contributions. Capital contributions are reported in the Statement of Revenues, Expenses and Changes in Net Position after non-operating revenues and expenses and their use is restricted. In fiscal years 2018 and 2017, the Authority recognized $25.4 million and $12.6 million of capital contributions, respectively. The 2018 and the 2017 capital contributions were generated from reimbursements under the FAA AIP grant program and the Nationally Significant Freight and Highway Project Program - Fastlane.

n) Compensated Absences

The Authority accrues for vacation and sick pay liabilities when they are earned by the employee. The liability for vested vacation and sick pay is reflected in the accompanying statements of net position as compensated absences. The current portion of compensated absences at June 30, 2018 and 2017 was $1.3 million and $1.4 million, respectively. The table below presents the Authority's compensated absences activity at June 30, 2018 and 2017 and for the years then ended (in thousands):

		2018	2017
Liability balance, beginning of year	$	19,308	19,536
Vacation and sick pay earned during the year		16,471	16,107
Vacation and sick pay used during the year		(16,886)	(16,335)
Liability balance, end of year	$	18,893	19,308

o) Pensions

For purposes of measuring the net pension liability, deferred outflows of resources and deferred inflows of resources related to pensions, and pension expense, information about the fiduciary net position of the Massachusetts Port Authority Employees Retirement System (the "Plan") and additions to/deductions from Plan's fiduciary net position have been determined on the same basis as they are reported by the Plan. For this purpose, benefit payments (including refunds of employee contributions) are recognized when due and payable in accordance with the benefit terms. Investments are reported at fair value.

p) Postemployment Benefits Other Than Pensions (OPEB)

For purposes of measuring the net OPEB liability, deferred outflows of resources and deferred inflows of resources related to OPEB, and OPEB expense, information about the fiduciary net position of the Massachusetts Port Authority Retiree Benefits Trust (the "Trust") and additions to/deductions from Trust's fiduciary net position have been determined on the same basis as they are reported by the Trust. For this purpose, the Trust recognizes benefit payments when due and payable in accordance with the benefit terms. Investments are reported at fair value.

q) Use of Estimates

The preparation of financial statements in conformity with GAAP requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenditures during the reporting period. Actual results could differ from those estimates.

r) *New Accounting Pronouncements*

In June 2015, GASB issued Statement No. 75, *Accounting and Financial Reporting for Postemployment Benefits Other Than Pensions ("OPEB")* ("GASB No. 75"). The objective of this Statement is to address reporting by governments that provide OPEB to their employees and for governments that finance OPEB for employees of other governments. The requirements of this Statement are effective for financial statements for periods beginning after June 15, 2017.

The requirements of GASB 75 apply to the financial statements of all state and local governmental employers whose employees (or volunteers that provide services to state and local governments) are provided with OPEB through OPEB plans that are administered through trusts that meet certain criteria and to the financial statements of state and local governmental nonemployer contributing entities that have a legal obligation to make contributions directly to such pension plans. The requirements apply whether the government's financial statements are presented in stand-alone financial reports or are included in the financial reports of another government.

GASB 75 establishes standards for measuring and recognizing liabilities, deferred outflows of resources, and deferred inflows of resources, and expense/expenditures. For defined OPEB plans, GASB 75 identifies the methods and assumptions that should be used to project benefit payments, discount projected benefit payments to their actuarial present value, and attribute that present value to periods of employer service. Note disclosure and required supplementary information requirements about OPEB are also addressed.

GASB 75 replaces the requirements of Statement No. 45, *Accounting and Financial Reporting by Employers for Postemployment Benefits Other than Pensions*. The requirements of Statement 45 remain applicable for OPEB that are not covered by the scope of this Statement.

The Authority adopted GASB 75 effective July 1, 2016. In connection with the adoption of this new standard all accounts were analyzed by management in order to assess the impact on the financial statements. The implementation of GASB 75 resulted in the Authority reporting a Net OPEB Liability of $121.2 million as of July 1, 2016. The Authority's Net Position as of July 1, 2016 and the Authority's Statement of Net Position as of June 30, 2017 and Statement of Revenues and Expenses and Changes in Net Position for the year ended June 30, 2017 have been restated to reflect the required adjustments.

(in thousands)	As Previously Reported	Adjustment	Restated
As of July 1, 2016:			
Net Position	$ 2,083,942	$ (165,072)	$ 1,918,870
For the year ended June 30, 2017:			
General and administrative	59,142	200	59,342
Pension and other post employment benefits	37,603	1,300	38,903
Total operating expense	725,848	1,500	727,348
Operating income	35,055	(1,500)	33,555
Increase in Net Position	90,772	(1,500)	89,272
As of June 30, 2017:			
Net OPEB liability	-	150,451	150,451
Net OPEB asset	53,850	(53,850)	-
Deferred outflows of resources related to OPEB	-	37,729	37,729
Net Position	$ 2,174,714	$ (166,572)	$ 2,008,142

In January 2017, GASB issued Statement No. 84, *Fiduciary Activities,* (“GASB No. 84”). This Statement establishes criteria for identifying fiduciary activities of all state and local governments. The focus of the criteria generally is on (1) whether a government is controlling the assets of the fiduciary activity and (2) the beneficiaries with whom a fiduciary relationship exists. Separate criteria are included to identify fiduciary component units and post employment benefit arrangements that are fiduciary activities.

An activity meeting the criteria should be reported in a fiduciary fund in the basic financial statements. Governments with activities meeting the criteria should present a statement of fiduciary net position and a statement of changes in fiduciary net position. An exception to that requirement is provided for a business-type activity that normally expects to hold custodial assets for three months or less.

This Statement describes four fiduciary funds that should be reported, if applicable: (1) pension (and other employee benefit) trust funds, (2) investment trust funds, (3) private-purpose trust funds, and (4) custodial funds. Custodial funds generally should report fiduciary activities that are not held in a trust or equivalent arrangement that meets specific criteria.

A fiduciary component unit, when reported in the fiduciary fund financial statements of a primary government, should combine its information with its component units that are fiduciary component units and aggregate that combined information with the primary government's fiduciary funds. This Statement also provides for recognition of a liability to the beneficiaries in a fiduciary fund when an event has occurred that compels the government to disburse fiduciary resources. Events that compel a government to disburse fiduciary resources occur when a demand for the resources has been made or when no further action, approval, or condition is required to be taken or met by the beneficiary to release the assets. The requirements of this Statement are effective for financial statements for periods beginning after December 15, 2018.

The Authority is currently evaluating the impact of the implementation of GASB No. 84 on its financial statements.

In March 2017, GASB issued Statement No. 85, *Omnibus 2017* ("GASB No. 85").The objective of this Statement is to address practice issues that have been identified during implementation and application of certain GASB Statements. This Statement addresses a variety of topics including issues related to blending component units, goodwill, fair value measurement and application, and OPEB.

Specifically, this Statement addresses the following topics:

- Blending a component unit in circumstances in which the primary government is a business-type activity that reports in a single column for financial statement presentation.
- Reporting amounts previously reported as goodwill and "negative" goodwill.
- Classifying real estate held by insurance entities.
- Measuring certain money market investments and participating interest-earning investment contracts at amortized cost.
- Timing of the measurement of pension or OPEB liabilities and expenditures recognized in financial statements prepared using the current financial resources measurement focus.
- Recognizing on-behalf payments for pensions or OPEB in employer financial statements.
- Presenting payroll-related measures in required supplementary information for purposes of reporting by OPEB plans and employers that provide OPEB.
- Classifying employer-paid member contributions for OPEB.
- Simplifying certain aspects of the alternative measurement method for OPEB.

- Accounting and financial reporting for OPEB provided through certain multiple-employer defined benefit OPEB plans.

The requirements of this Statement are effective for financial statements for periods beginning after June 15, 2017. The Authority adopted this Statement as of July 1, 2016 and there was no significant impact on its financial statements.

In May 2017, GASB issued Statement No. 86, *Certain Debt Extinguishment Issues,* ("GASB No. 86").The primary objective of this Statement is to improve consistency in accounting and financial reporting for in-substance defeasance of debt by providing guidance for transactions in which cash and other monetary assets acquired with only existing resources—resources other than the proceeds of refunding debt—are placed in an irrevocable trust for the sole purpose of extinguishing debt. This Statement also improves accounting and financial reporting for prepaid insurance on debt that is extinguished and notes to financial statements for debt that is defeased in substance.

The requirements of this Statement are effective for financial statements for periods beginning after June 15, 2017. The Authority adopted this Statement and there was no impact on its financial statements.

In June 2017, GASB issued Statement No. 87, *Leases,* ("GASB No. 87").The objective of this Statement is to better meet the information needs of financial statement users by improving accounting and financial reporting for leases by governments. This Statement increases the usefulness of governments' financial statements by requiring recognition of certain lease assets and liabilities for leases that previously were classified as operating leases and recognized as inflows of resources or outflows of resources based on the payment provisions of the contract. It establishes a single model for lease accounting based on the foundational principle that leases are financings of the right to use an underlying asset. Under this Statement, a lessee is required to recognize a lease liability and an intangible right-to-use lease asset, and a lessor is required to recognize a lease receivable and a deferred inflow of resources, thereby enhancing the relevance and consistency of information about governments' leasing activities.

The requirements of this Statement are effective for financial statements for periods beginning after December 15, 2019.

The Authority is currently evaluating the impact of the implementation of GASB No. 87 on its financial statements.

In April 2018, GASB issued Statement No. 88, *Certain Disclosures Related to Debt, Including Direct Borrowings and Direct Placements,* ("GASB No. 88") The primary objective of this Statement is to improve the information that is disclosed in notes to government financial statements related to debt, including direct borrowings and direct placements. It also clarifies which liabilities governments should include when disclosing information related to debt.

This Statement defines debt for purposes of disclosure in notes to financial statements as a liability that arises from a contractual obligation to pay cash (or other assets that may be used in lieu of cash) in one or more payments to settle an amount that is fixed at the date the contractual obligation is established.

This Statement requires that additional essential information related to debt be disclosed in notes to financial statements, including unused lines of credit; assets pledged as collateral for the debt; and terms specified in debt agreements related to significant events of default with finance-related consequences, significant termination events with finance-related consequences, and significant subjective acceleration clauses.

For notes to financial statements related to debt, this Statement also requires that existing and additional information be provided for direct borrowings and direct placements of debt separately from other debt.

The requirements of this Statement are effective for reporting periods beginning after June 15, 2018.

The Authority is currently evaluating the impact of the implementation of GASB No. 88 on its financial statements.

In June 2018, GASB issued Statement No. 89, *Accounting for Interest Cost Incurred Before The End Of A Construction Period,* ("GASB No. 89") The objectives of this Statement are (1) to enhance the relevance and comparability of information about capital assets and the cost of borrowing for a reporting period and (2) to simplify accounting for interest cost incurred before the end of a construction period. This Statement establishes accounting requirements for interest cost incurred before the end of a construction period. Such interest cost includes all interest that previously was accounted for in accordance with the requirements of paragraphs 5–22 of Statement No. 62, *Codification of Accounting and Financial Reporting Guidance Contained in Pre-November 30, 1989 FASB and AICPA Pronouncements,* which are superseded by this Statement. This Statement requires that interest cost incurred before the end of a construction period be recognized as an expense in the period in which the cost is incurred for financial statements prepared using the economic resources measurement focus. As a result, interest cost incurred before the end of a construction period will not be included in the historical cost of a capital asset reported in a business-type activity or enterprise fund.

This Statement also reiterates that in financial statements prepared using the current financial resources measurement focus, interest cost incurred before the end of a construction period should be recognized as an expenditure on a basis consistent with governmental fund accounting principles.

The requirements of this Statement are effective for reporting periods beginning after December 15, 2019.

The Authority is currently evaluating the impact of the implementation of GASB No. 89 on its financial statements.

In September 2018, GASB issued Statement No. 90, *Majority Equity Interests – an amendment of GASB Statements No. 14 and No. 61* ("GASB No. 90"). The primary objectives of this Statement are to improve the consistency and comparability of government's majority equity interest in legally separate organizations and to improve the relevance of financial statement information for certain component units.

The requirements of this Statement are effective for reporting periods beginning after December 15, 2018.

The Authority is currently evaluating the impact of the implementation of GASB No. 90 on its financial statements.

2. Reconciliation between increase in net position as calculated under GAAP and net revenues as calculated under accounting practices prescribed by the 1978 Trust Agreement

Presented below are the calculations of the net revenues of the Authority under the 1978 Trust Agreement. Net revenue calculated based on the 1978 Trust Agreement is used in determining the Authority's compliance with the debt service coverage ratio (in thousands).

	2018	2017
Increase in Net Position per GAAP	$ 156,191	$ 89,272
Additions:		
Depreciation and amortization	262,162	252,846
Interest expense	67,490	67,157
Payments in lieu of taxes	20,408	19,276
Other operating expenses	10,398	3,789
Terminal A bonds - debt service contribution	12,232	11,941
OPEB expenses, net	4,480	4,903
Settlement of claims	(2,019)	(248)
Pension expense	(4,576)	6,141
Less:		
Passenger facility charges	(81,016)	(76,296)
Customer facility charges	(33,003)	(33,055)
Self insurance expenses	(61)	(245)
Capital grant revenue	(25,384)	(12,635)
Net decrease (increase) in the fair value of investments	4,354	4,501
Loss (gain) on sale of equipment	(182)	(125)
Other (revenues) expenses	(1,654)	3,945
Other non-operating revenues	(1,169)	(3,865)
Investment income	(6,293)	(5,191)
Net Revenue per the 1978 Trust Agreement	$ 382,358	$ 332,111

Total net revenues, as defined by the 1978 Trust Agreement, pledged for the repayment of bonds issued under the 1978 Trust Agreement were $382.4 million and $332.1 million for the years ended June 30, 2018 and 2017, respectively.

3. Deposits and Investments

The Authority's investments are made in accordance with the provisions of the 1978 Trust Agreement, the PFC Trust Agreement (which was superseded by the PFC Depositary Agreement in July 2017 and the CFC Trust Agreement along with the investment policy adopted by the Board (the "Investment Policy"). The goals of the Investment Policy are, in order of importance, to preserve capital, to provide liquidity and to generate interest income.

As of June 30, 2018 and 2017, all investments were held on behalf of the Authority by the Trustee, the PFC Custodian the CFC Trustee or custodians in the Authority's name. The 1978 Trust Agreement, the PFC Depositary Agreement and the CFC Trust Agreement require that securities collateralizing repurchase agreements must continuously have a fair value at least equal to the cost of the agreement plus accrued interest.

The Authority's investments in forward delivery agreements are in the form of a guaranteed investment contract ("GIC") which provides for, among other things, the sequential delivery of securities to be sold to the Trustee, PFC Custodian, or CFC Trustee, as applicable, periodically at a discount from maturity value such that the aggregate discount equals the interest rate previously agreed to between the Authority and the provider of the guaranteed investment contract.

The total accumulated unrealized gain (loss) due to the changes in fair value of investments related to investments with maturities in excess of one year was a loss of approximately $5.7 million as of June 30, 2018 and a loss of approximately $1.3 million as of June 30, 2017.

The following summarizes the Authority's cash and cash equivalents and investments by type held at June 30, 2018 and 2017 (in thousands):

2018	Credit Rating (1)	Cost	Fair Value	Effective Duration
Massachsetts Municipal Depository Trust (6)	Unrated	$ 181,981	$ 181,981	0.003
Federal Home Loan Bank	AA+ / Aaa	49,006	48,753	0.989
Federally Deposit Insurance Corporation	Unrated (2)	1,001	1,001	0.003
Federal Home Loan Mortgage Corp.	AA+ / Aaa	41,799	41,452	0.946
Federal National Mortgage Association	AA+ / Aaa	81,155	80,395	1.350
Federal Farm Credit	AA+ / Aaa	18,055	17,990	0.791
Guaranteed Investment Contracts (GIC) (6)	AA+ / A1 (4)	44,818	44,818	10.229
Cash Deposit	Unrated	1,818	1,818	0.003
Certificates of Deposit	AAA / Aaa (3)	33,327	33,327	0.351
Commercial Paper	A-1/ P-1 (5)	423,452	423,452	0.271
Government Fund-Morgan Stanley / Wells Fargo	AAA / Aaa (5)	22,591	22,591	0.003
Municipal Bond	AAA/ Aa1	99,734	98,697	1.179
Money Market Funds	Unrated	2,231	2,231	0.003
Insured Cash Sw eep	Unrated (2)	2,962	2,962	0.003
Treasury Notes	AA+ / Aaa	12,036	11,985	0.862
Corporate Bonds	AA- / Aa2 (7)	244,523	241,370	2.254
		$ 1,260,489	$ 1,254,823	

2017	Credit Rating (1)	Cost	Fair Value	Effective Duration
Massachsetts Municipal Depository Trust (6)	Unrated	$ 233,906	$ 233,906	0.003
Federal Home Loan Bank	AA+ / Aaa	97,379	97,197	0.989
Federally Deposit Insurance Corporation	Unrated (2)	5,003	5,003	0.003
Federal Home Loan Mortgage Corp.	AA+ / Aaa	50,904	50,728	0.946
Federal National Mortgage Association	AA+ / Aaa	98,923	98,484	1.350
Federal Farm Credit	AA+ / Aaa	36,085	36,025	0.791
Guaranteed Investment Contracts (GIC) (6)	AA+ / A1 (4)	43,051	43,051	10.229
Cash Deposit	Unrated	1,085	1,085	0.003
Certificates of Deposit	AAA / Aaa (3)	58,838	58,838	0.351
Commercial Paper	A-1/ P-1 (5)	188,769	188,769	0.271
Government Fund-Morgan Stanley / Wells Fargo	AAA / Aaa (5)	31,740	31,740	0.003
Municipal Bond	AAA/ Aa1	117,603	117,498	1.179
Money Market Funds	Unrated	3,015	3,015	0.003
Insured Cash Sw eep	Unrated (2)	3,263	3,263	0.003
Treasury Notes	AA+ / Aaa	33,027	33,012	0.862
Corporate Bonds	AA- / Aa2 (7)	132,894	132,558	2.254
		$ 1,135,485	$ 1,134,172	

1. The ratings are from S&P or Moody's as of the fiscal year presented.
2. FDIC Insured Deposits Accounts.
3. Collateralized by Federal Agency Notes or Letter of Credit backed by each reserve.
4. Underlying rating of security held.
5. Credit quality of fund holdings.
6. MMDT and GIC are carried at cost, w hich approximates fair value in the tables.
7. The Authority ow ns a diverse portfolio of corporate bonds w ith S&P credit ratings ranging from A to AAA and Moody's credit ratings ranging from A1 to Aaa. These corporate bonds have an average credit rating of AA- / Aa2.

The table below presents the Authority's cash and cash equivalents and investments based on maturity date (in thousands):

	2018		2017	
	Cost	Fair Value	Cost	Fair Value
Securities maturing in 1 year or more	$ 398,566	$ 393,681	$ 412,899	$ 411,701
Securities maturing in less than 1 year	649,339	648,558	449,577	449,462
Cash and cash equivalents	212,584	212,584	273,009	273,009
	$ 1,260,489	$ 1,254,823	$ 1,135,485	$ 1,134,172

Credit Risk

Credit risk is the risk that the Authority will be negatively impacted due to the default of the security issuer or investment counterparty.

The Authority's 1978 Trust Agreement, PFC Depositary Agreement and CFC Trust Agreement each stipulate that, in addition to U.S. Treasury and government agency obligations, only certain highly rated securities are eligible investments, including bonds or obligations of any state or political subdivision thereof, rated in the two highest rating categories without regard to gradations within rating categories, by both Moody's (AAA, Aa1, Aa2 and Aa3) and S&P (AAA, AA+, AA, and AA-); commercial paper of a U.S. corporation, finance company or money market funds rated in the highest rating category, without regard to gradations within categories, by both Moody's and S&P; and investment contracts with banks whose long-term unsecured debt rating is in one of the two highest rating categories by both Moody's and S&P. In addition, U.S. dollar denominated corporate bonds, notes or other debt obligations issued or guaranteed by a domestic or foreign corporation, financial institution, non-profit or other entity rated in one of the three highest rating categories, without regard to gradations within such categories by Moody's and S&P.

a) Custodial Credit Risk – Deposits

The custodial credit risk for deposits is the risk that in the event of a bank failure, the Authority's deposits may not be recovered. Bank deposits in excess of the insured amount are uninsured and uncollateralized.

The Authority maintains depository accounts with Bank of America, N.A., Wells Fargo Bank, N.A., TD Bank, N.A. and The Bank of New York Mellon, the PFC Custodian. The Authority maintains a payroll disbursement, lockbox and collection accounts (for other than PFCs) with Bank of America, N.A. None of these accounts are collateralized.

The Authority's cash on deposits in the banks noted above at June 30, 2018 and 2017 was $1.8 million and $1.1 million, respectively, and of these amounts, $1.3 million and $1.0

million was insured in each year, and no amount was collateralized at June 30, 2018 or 2017.

b) *Custodial Credit Risk – Investments*

Custodial credit risk is the risk that, in the event of a failure of the counterparty, the Authority would not be able to recover the value of its investments or collateral securities that were in the possession of an outside party. Investment securities are exposed to custodial credit risk if they are uninsured or not registered in the name of the Authority and are held by either the counterparty or, the counterparty's trust department or agent, but not in the Authority's name.

The Authority is authorized by the 1978 Trust Agreement, the PFC Depositary Agreement, the CFC Trust Agreement and the Investment Policy to invest in obligations of the U.S. Treasury, including obligations of its agencies and instrumentalities, bonds and notes of public agencies or municipalities, bank time deposits, guaranteed investment contracts, money market accounts, commercial paper of a U.S. corporation or finance company and corporate bonds. All investments are held by a third party in the Authority's name. These investments are recorded at fair value.

Additionally, the Authority is authorized to invest in the Massachusetts Municipal Depository Trust ("MMDT"), a pooled money market like investment fund managed by the Commonwealth of Massachusetts, established under the General Laws, Chapter 29, Section 38A. MMDT investments are carried at amortized cost, which approximates fair value which is the same as the value of the pool. The Authority can purchase and sell its investments at any time without penalty.

The following guaranteed investment contracts were in force as of June 30, 2018 and 2017, respectively; they are uncollateralized and recorded at cost:

Investment Agreement Provider	Rate	Maturity	2018	2017
Trinity Plus Funding Company	4.357%	January 2, 2031	$ 19,843	$ 19,003
GE Funding Capital Markets	3.808%	December 31, 2030	24,975	24,048
Total			$ 44,818	$ 43,051

c) *Concentration of Credit Risk – Investments*

Concentration of credit risk is assumed to arise when the amount of investments that the Authority has with any one issuer exceeds 5% of the total value of the Authority's investments. The Authority consults with its Investment Advisor to select Commercial Paper Issuers with strong credit ratings. The book values of portions of the Authority-wide portfolio, excluding investments issued by MMDT, the FDIC, or U.S. Government guaranteed obligations and the underlying securities held under forward delivery agreements at cost, that exceed 5% of the portfolio are as follows (in thousands):

Commercial Paper Issuer		2018		2017
Bank of Tokyo Mitsubishi UFJ	$	61,482	$	54,819
BNP Paribas		29,767		-
Canadian Imperial		10,456		-
Dexia		61,264		-
General Electric		40,876		-
JP Morgan Chase		61,530		47,832
Credit Agricole		61,563		31,843
Rabobank		3,961		-
Toyota Motor Corporation		30,858		54,275
ING Funding		61,695		-
Total	$	423,452	$	188,769
% of Portfolio		34.00%		16.70%

d) *Credit Ratings– Investments*

The 1978 Trust Agreement, the PFC Depositary Agreement, the CFC Trust Agreement and the Investment Policy generally limit the Authority in the types of investments it can purchase to the two highest rating categories without regard to gradations within the rating categories by both Moody's (Aaa, Aa1, Aa2, and Aa3) and S&P (AAA, AA+, AA, and AA-) and in corporate bonds rated in one of the three highest rating categories without regard to gradations within such categories by Moody's and S&P.

Investments in bank certificates of deposits were fully collateralized. Also, the Authority invested in MMDT, managed by the State Treasury, which is not rated.

e) *Interest Rate Risk – Investments*

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. The Authority has set targets for the preferred maturity structure of the investments held in each fund and account, and also sets targets each quarter for the effective duration for each fund that reflect the need for liquidity and the expected tradeoffs between yield and term for each different fund and account. It is the Authority's practice to hold investments until maturity in order to insulate the Authority's investment earnings from interest rate risk. The Authority mitigates interest rate risk by managing the weighted average maturity of each portfolio type to best meet its liquidity needs.

f) *Cash, Cash Equivalents and Investments by Fund*

The following summarizes cash and investments, at cost and fair value, as of June 30, by the various funds and accounts established by the Authority for debt covenant requirements and other purposes. In the following table, the fair value of MMDT and GIC approximate their costs (in thousands):

	2018		2017	
1978 Trust	**Cost**	**Fair Value**	**Cost**	**Fair Value**
Improvement and Extension Fund	$ 306,833	$ 304,378	$ 277,639	$ 277,012
Capital Budget Account	135,774	135,774	68,323	68,323
Debt Service Reserve Funds	113,714	112,827	114,717	114,509
Debt Service Funds	83,226	83,226	77,137	77,137
Maintenance Reserve Fund	208,620	207,405	172,845	172,539
Operating/Revenue Fund	71,063	71,063	89,765	89,764
Subordinated Debt Funds	47,218	47,218	45,449	45,449
Self-Insurance Account	32,047	31,689	31,492	31,474
2015 B Project Fund	-	-	16,749	16,749
2016 B Project Fund	17,143	17,143	53,912	53,908
2017 B Project Fund	63,063	63,063	-	-
Other Funds	49,777	49,777	20,409	20,409
1999 PFC Trust /PFC Depositary				
Debt Service Reserve Funds	-	-	551	551
Debt Service Funds	-	-	54,388	54,388
Other PFC Funds	38,600	38,453	37,544	37,517
2011 CFC Trust				
Debt Service Reserve Funds	28,023	27,821	27,977	27,959
CFC Maintenance Reserve Fund	2,587	2,585	1,696	1,696
Debt Service Funds	9,519	9,519	9,402	9,402
Other CFC Funds	53,282	52,882	35,490	35,386
Total	$ 1,260,489	$ 1,254,823	$ 1,135,485	$ 1,134,172

g) *Fair Value Measurement*

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is a market-based measurement, not an entity-specific measurement. For some assets and liabilities, observable market transactions or market information might be available; for others, it might not be available. However, the objective of a fair value measurement in both cases is the same—that is, to determine the price at which an orderly transaction to sell the asset or to transfer the liability would take place between market participants at the measurement date under current market conditions. Fair value is an exit price at the measurement date from the perspective of a market participant that controls the asset or is obligated for the liability.

The fair value hierarchy categorizes the inputs to valuation techniques used to measure fair value into three levels. Level 1 inputs are quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date. Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for an asset or liability, either directly or indirectly. Level 3 inputs are unobservable inputs for an asset or liability. The fair value hierarchy gives the highest priority to Level 1 inputs and the lowest priority to Level 3 inputs.

The following tables show the fair value and the fair value measurements for our cash and cash equivalents and investments:

Cash, Cash equivalents and Investments Measured at Fair Value (in thousands)

As of June 30, 2018	Fair Value	Level 1	Level 2	Level 3
Federal Home Loan Bank	$ 48,753	$ -	$ 48,753	$ -
Federally Insured Cash Account	1,001	1,001	-	-
Federal Home Loan Mortgage Corp.	41,452	-	41,452	-
Federal National Mortgage Association	80,395	-	80,395	-
Federal Farm Credit	17,990	-	17,990	-
Cash Deposit	1,818	1,818	-	-
Certificates of Deposit	33,327	33,327	-	-
Commercial Paper	423,452	-	423,452	-
Government Fund-Morgan Stanley / Wells Fargo	22,591	22,591	-	-
Municipal Bond	98,697	-	98,697	-
Money Market Funds	2,231	2,231	-	-
Insured Cash Sweep	2,962	2,962	-	-
Treasury Notes	11,985	-	11,985	-
Corporate Bonds	241,370	-	241,370	-
Total Cash, Cash equivalents and Investments Measured at Fair Value	$ 1,028,024	$ 63,930	$ 964,094	$ -

Cash, Cash equivalents and Investments Measured at Fair Value (in thousands)

As of June 30, 2017	Fair Value	Level 1	Level 2	Level 3
Federal Home Loan Bank	$ 97,197	$ -	$ 97,197	$ -
Federally Insured Cash Account	5,003	5,003	-	-
Federal Home Loan Mortgage Corp.	50,728	-	50,728	-
Federal National Mortgage Association	98,484	-	98,484	-
Federal Farm Credit	36,025	-	36,025	-
Cash Deposit	1,085	1,085	-	-
Certificates of Deposit	58,838	58,838	-	-
Commercial Paper	188,769	-	188,769	-
Government Fund-Morgan Stanley / Wells Fargo	31,740	31,740	-	-
Municipal Bond	117,498	-	117,498	-
Money Market Funds	3,015	3,015	-	-
Insured Cash Sweep	3,263	3,263	-	-
Treasury Notes	33,012	-	33,012	-
Corporate Bonds	132,558	-	132,558	-
Total Cash, Cash equivalents and Investments Measured at Fair Value	$ 857,215	$ 102,944	$ 754,271	$ -

Cash and Money Market Funds

As of June 30, 2018 and 2017, the Authority held positions in various cash and money market funds and the fair values of those funds were $63.9 million and $102.9 million, respectively. The fair values of the cash and money market funds were valued using quoted market prices (Level 1).

Federal Agency Notes

As of June 30, 2018 and 2017, the Authority held positions in federal agency notes and the fair values were $188.6 million and $282.4 million, respectively. The fair values of the federal agency notes were based on a market approach using quoted prices by a third party for markets that are not active (Level 2).

Commercial Paper Notes

As of June 30, 2018 and 2017, the Authority held positions in commercial paper notes and the fair values were $423.5 million and $188.8 million, respectively. The fair values of the commercial paper notes were based on a market approach using quoted prices by a third party for markets that are not active (Level 2).

Municipal Bonds

As of June 30, 2018 and 2017, the Authority held positions in municipal bonds and the fair values were $98.7 million and $117.5 million, respectively. The fair values of the municipal bonds were based on a market approach using quoted prices by a third party for markets that are not active (Level 2).

Treasury Notes

As of June 30, 2018 and 2017, the Authority held positions in Treasury Notes and the fair values were $12.0 million and $33.0 million, respectively. The fair values of the Treasury Notes were based on a market approach using quoted prices by a third party for markets that are not active (Level 2).

Corporate Bonds

As of June 30, 2018 and 2017, the Authority held positions in corporate bonds and the fair values were $241.4 and $132.6 million. The fair values of the corporate bonds was based on a market approach using quoted prices by a third party for markets that are not active (Level 2).

4. Capital Assets

Capital assets consisted of the following at June 30, 2018 and 2017 (in thousands):

	June 30, 2017	Additions and Transfers In	Deletions and Transfers Out	June 30, 2018
Capital assets not being depreciated				
Land	$ 230,593	$ 7	$ —	$ 230,600
Construction in progress	149,730	337,320	294,268	192,782
Total capital assets not being depreciated	380,323	337,327	294,268	423,382
Capital assets being depreciated				
Buildings	3,440,430	128,337	4,508	3,564,259
Runway and other paving	878,224	69,824	—	948,048
Roadway	718,290	48,775	11	767,054
Machinery and equipment	630,754	47,098	957	676,895
Air rights	184,905	226	—	185,131
Parking rights	46,261	—	—	46,261
Total capital assets being depreciated	5,898,864	294,260	5,476	6,187,648
Less accumulated depreciation:				
Buildings	1,712,773	126,929	3,172	1,836,530
Runway and other paving	514,072	44,894	—	558,966
Roadway	390,451	30,728	6	421,173
Machinery and equipment	368,448	51,334	950	418,832
Air rights	126,277	6,711	—	132,988
Parking rights	24,673	1,541	—	26,214
Total accumulated depreciation	3,136,694	262,137	4,128	3,394,703
Total capital assets being depreciated, net	2,762,170	32,123	1,348	2,792,945
Capital assets, net	$ 3,142,493	$ 369,450	$ 295,616	$ 3,216,327

Depreciation and amortization for fiscal year 2018 and 2017 was $262.2 million and $252.8 million, respectively.

		June 30, 2016		Additions and Transfers In		Deletions and Transfers Out		June 30, 2017
Capital assets not being depreciated								
Land	$	226,497	$	4,388	$	292	$	230,593
Construction in progress		225,930		308,789		384,989		149,730
Total capital assets not being depreciated		452,427		313,177		385,281		380,323
Capital assets being depreciated								
Buildings		3,187,058		260,994		7,622		3,440,430
Runway and other paving		830,546		47,678		—		878,224
Roadway		713,641		4,649		—		718,290
Machinery and equipment		565,267		66,547		1,060		630,754
Air rights		184,173		732		—		184,905
Parking rights		46,261		—		—		46,261
Total capital assets being depreciated		5,526,946		380,600		8,682		5,898,864
Less accumulated depreciation:								
Buildings		1,592,846		124,246		4,319		1,712,773
Runway and other paving		474,008		40,064		—		514,072
Roadway		361,721		28,730		—		390,451
Machinery and equipment		321,309		48,146		1,007		368,448
Air rights		119,462		6,815		—		126,277
Parking rights		23,130		1,543		—		24,673
Total accumulated depreciation		2,892,476		249,544		5,326		3,136,694
Total capital assets being depreciated, net		2,634,470		131,056		3,356		2,762,170
Capital assets, net	$	3,086,897	$	444,233	$	388,637	$	3,142,493

Capital assets (excluding construction in progress) at June 30 comprised the following (in thousands):

	2018	2017
Facilities completed by operation:		
Airports	$ 5,752,753	$ 5,592,547
Port	665,495	536,910
Capital assets (excluding construction in progress)	$ 6,418,248	$ 6,129,457

During fiscal year 2017, the Authority completed and placed into service portions of its new Checked Baggage Inspection System ("CBIS"). The write off of the old CBIS generated a $3.3 million current period expense in fiscal year 2017, which is included in depreciation expense.

5. Bonds and Notes Payable

Long-term debt at June 30, 2018 consisted of the following and represents maturities on the Authority's fiscal year basis (in thousands):

	June 30, 2017	Additions	Reductions	June 30, 2018	Due within one year
Revenue Bonds:					
Senior Debt-1978 Trust Agreement:					
2007, Series A, 4.00% to 4.50%, issued May 31, 2007 due 2017 to 2038	$ 1,275	$ —	$ 1,275	$ —	$ —
2007, Series C, 4.00% to 5.00%, issued May 31, 2007 due 2017 to 2028	23,615	—	23,615	—	—
2008, Series C, 4.60% to 5.00%, issued July 9, 2008 due 2017 to 2021	12,850	—	5,020	7,830	5,275
2010, Series A, 3.00% to 5.00%, issued August 5, 2010 due 2017 to 2041	90,160	—	2,135	88,025	2,220
2010, Series B, 3.00% to 5.00%, issued August 5, 2010 due 2017 to 2041	128,175	—	1,865	126,310	1,920
2010, Series C, 4.00% to 5.00%, issued August 5, 2010 due 2017 to 2019	7,340	—	3,530	3,810	3,810
2010, Series D, Multi-Modal variable, issued August 5, 2010 due 2017 to 2030	78,690	—	78,690	—	—
2012, Series A, 3.00% to 5.00%, issued July 11, 2012 due 2017 to 2043	96,305	—	5,975	90,330	1,560
2012, Series B, 3.00% to 5.00%, issued July 11, 2012 due 2017 to 2033	158,830	—	2,425	156,405	7,150
2014, Series A, 2.00% to 5.00%, issued July 17, 2014 due 2018 to 2045	45,455	—	825	44,630	845
2014, Series B, 4.00% to 5.00%, issued July 17, 2014 due 2018 to 2045	48,230	—	855	47,375	890
2014, Series C, 2.00% to 5.00%, issued July 17, 2014 due 2017 to 2036	144,020	—	7,180	136,840	7,400
2015, Series A, 5.00%, issued July 15, 2015 due 2019 to 2045	104,480	—	—	104,480	—
2015, Series B, 5.00%, issued July 15, 2015 due 2019 to 2045	67,005	—	—	67,005	—
2015, Series C, 2.12% to 2.83%, issued June 30, 2015 due 2026 to 2030	156,965	—	14,070	142,895	14,370
2016, Series A, 3.00% to 5.00%, issued July 20, 2016 due 2018 to 2038	49,970	—	290	49,680	1,320
2016, Series B, 4.00% to 5.00%, issued July 20, 2016 due 2043 and 2046	180,285	—	—	180,285	—
2017, Series A, 4.00% to 5.00%, issued July 19, 2017 due 2044 and 2047	—	169,500	—	169,500	5,565
Subtotal Senior Debt	$ 1,393,650	$ 169,500	$ 147,750	$ 1,415,400	$ 52,325

	June 30, 2017	Additions	Reductions	June 30, 2018	Due within one year
Subordinated debt- 1978 Trust Agreement:					
2000, Series A,B & C, 6.45%, issued December 29, 2000 due 2031	$ 40,000	$ —	$ —	$ 40,000	$ —
2001, Series A,B & C, 6.45%, issued January 2, 2001 due 2031	34,000	—	—	34,000	—
Subtotal Subordinate Debt	74,000	—	—	74,000	—
Senior Debt - PFC Trust Agreement:					
2007, Series B, 4.00% to 5.00%, issued May 31, 2007 due 2016 to 2018	$ 9,760	$ —	$ 9,760	$ —	$ —
2007, Series D, 5.00%, issued May 31, 2007 due 2016 to 2018	43,150	—	43,150	—	—
Subtotal PFC Senior Debt	52,910	—	52,910	—	—
Senior Debt - CFC Trust Agreement:					
2011, Series A, 5.125%, issued June 8, 2011 due 2038 to 2042	$ 58,030	$ —	$ —	$ 58,030	$ —
2011, Series B, 3.53% to 6.352%, issued June 8, 2011 due 2017 to 2038	140,165	—	3,620	136,545	3,780
Subtotal CFC Senior Debt	198,195	—	3,620	194,575	3,780
Total Bonds Payable	$ 1,718,755	$ 169,500	$ 204,280	$ 1,683,975	$ 56,105
Less unamortized amounts:					
Bond premium (discount), net	131,910	27,248	7,817	151,341	6,846
Total Bonds Payable, net	$ 1,850,665	$ 196,748	$ 212,097	$ 1,835,316	$ 62,951

The Authority's bonds payable at June 30, 2018 contain no variable rate debt. The bonds payable at June 30, 2017 included $78.7 million of variable rate demand bonds ("VRDB") consisting of Series 2010 D. The VRDBs had remarketing features which allow bondholders the right to return, or put, the bonds to the Authority. On August 7, 2013, the Authority entered into a five year irrevocable letter of credit agreement with State Street Bank, in support of the VRDBs. This agreement required repayment of the tendered, unremarketed VRDBs and any associated obligations on the bonds tendered. This agreement terminated in connection with the refunding of the Series 2010 D bonds and subsequent redemption thereof on July 20, 2017.

The VRDBs were issued as multi-modal bonds, thus allowing the Authority to reissue and refund through one of several modes. As a result, the Authority had classified $7.3 million to its current portion of long term debt, in addition to the amounts identified in the schedules of the Authority's bonds payable at June 30th due within one year, for the fiscal year ending June 30, 2017.

The following summarizes the Authority's revenue bonds activity at June 30 (in thousands):

	June 30, 2017	Additions	Reductions	June 30, 2018	Due within one year
Senior Debt-1978 Trust Agreement:	$ 1,393,650	$ 169,500	$ 147,750	$ 1,415,400	$ 52,325
Subordinated Debt- 1978 Trust Agreement	74,000	—	—	74,000	—
Senior Debt - PFC Trust Agreement:	52,910	—	52,910	—	—
Senior Debt - CFC Trust Agreement:	198,195	—	3,620	194,575	3,780
	$ 1,718,755	$ 169,500	$ 204,280	$ 1,683,975	$ 56,105

	June 30, 2016	Additions	Reductions	June 30, 2017	Due within one year
Senior Debt-1978 Trust Agreement:	$ 1,274,590	$ 230,255	$ 111,195	$ 1,393,650	$ 60,185
Subordinated Debt- 1978 Trust Agreement	74,000	—	—	74,000	—
Senior Debt - PFC Trust Agreement:	75,235	—	22,325	52,910	52,910
Senior Debt - CFC Trust Agreement:	201,680	—	3,485	198,195	3,620
	$ 1,625,505	$ 230,255	$ 137,005	$ 1,718,755	$ 116,715

Debt service requirements on revenue bonds (1978 Trust and CFC Trust) outstanding at June 30, 2018 are as follows (in thousands):

	Principal	Interest	Total
Year ending June 30:			
2018	$ 56,105	$ 80,679	$ 136,784
2019	54,215	79,000	133,215
2020	57,000	76,824	133,824
2021	58,160	74,550	132,710
2022	61,000	72,039	133,039
2023 – 2027	323,740	318,960	642,700
2028 – 2032	355,775	237,376	593,151
2033 – 2037	256,325	149,758	406,083
2038 – 2042	265,770	85,954	351,724
2043 – 2047	195,885	21,083	216,968
Total	$ 1,683,975	$ 1,196,223	$ 2,880,198

a) Senior Debt - 1978 Trust Agreement

On July 19, 2017, the Authority issued $169.5 million of Massachusetts Port Authority Revenue Bonds in one series. The Series 2017 A Bonds were issued in the principal amount of $169.5 million with an original issue premium of approximately $27.2 million and an interest rate of 5.0%. The 2017 A Bonds were issued, in part, to refund all of the currently outstanding Series 2007 C Revenue Refunding Bonds and all of the currently outstanding variable rate Series 2010 D Multi-Modal Revenue Refunding Bonds and resulted in a net present value savings of $2.8 million.

Additionally, the Authority expects to use approximately $91.0 million of the proceeds of the 2017 A Bonds to finance a portion of the Authority's FY18-22 Capital Program. Due to the "private activity" nature of the construction projects, these bonds were sold as AMT bonds.

On July 20, 2016, the Authority issued $230.3 million of Massachusetts Port Authority Revenue Bonds in two series. The Series 2016 A Revenue Refunding Bonds were issued in the principal amount of $50.0 million with an original issue premium of approximately $12.6 million and interest rates ranging from 3.0% to 5.0%. The 2016 A Bonds were issued to refund a portion of the currently outstanding Bonds, Series 2007 A Revenue Bonds on an advance basis and all of the currently outstanding variable rate demand revenue bonds, Series 2008 A.

The Series 2016 B Revenue Bonds were issued in the principal amount of $180.3 million with an original issue premium of approximately $26.8 million and interest rates ranging from 4.0% to 5.0%. The 2016 B Bonds were issued to finance a portion of the Authority's FY16-FY20 Capital Program in part through the repayment of $25.0 million of then outstanding Series 2012 B Tax Exempt Commercial Paper notes, which had been used to finance a portion of the Authority's FY16-FY20 Capital Program prior to the date of issuance of the Series 2016 B Bonds. Due to the “private activity” nature of the construction projects, these bonds were sold as AMT bonds.

The Authority, through its 1978 Trust Agreement, has covenanted to maintain a debt service coverage ratio of not less than 1.25. Debt service coverage is calculated based on a formula set forth in the 1978 Trust Agreement. Historically, the Authority has maintained a debt service coverage ratio higher than its Trust Agreement requirement to maintain its investment grade bond ratings. As of June 30, 2018 and 2017, the Authority’s debt service coverage under the 1978 Trust Agreement was 3.43 and 3.27, respectively.

b) Subordinate Debt - 1978 Trust Agreement

Subordinate debt is payable solely from funds on deposit in the Improvement and Extension Fund and is not subject to the pledge of the 1978 Trust Agreement or the CFC Trust Agreement. The Authority invested $12.0 million in January 2001 which at maturity will provide for the $74.0 million principal payments of the subordinate debt at their respective maturities on December 31, 2030 and January 1, 2031. As of June 30, 2018, the value of the two GICs was approximately $44.8 million as compared to $43.1 million as of June 30, 2017.

c) Senior Debt - PFC Trust Agreement

As of July 3, 2017, there are no PFC Revenue Bonds outstanding under the PFC Trust Agreement, as the Authority paid the final maturities outstanding of $52.9 million on July 3, 2017. Massport currently has authority to impose and use a $4.50 PFC and, in accordance with the PFC Depositary Agreement. The Authority maintains the ability to file new PFC applications with the FAA as well as the ability to issue new PFC bonds under the PFC Trust Agreement.

The Authority’s PFC debt was backed by a pledge of the $4.50 PFC collections. The Authority earned PFC Revenues, as defined by the PFC Trust Agreement, of approximately $76.3 million during fiscal year 2017. The amount includes approximately $0.5 million of investment income on PFC receipts during fiscal year 2017.

The PFC Trust Agreement required a First Lien Sufficiency covenant ratio in excess of 1.05. As of June 30, 2017, the Authority’s PFC First Lien Sufficiency covenant ratio under the PFC Trust Agreement was 63.44.

d) Senior Debt - CFC Trust Agreement

The Authority’s outstanding CFC debt continues to be backed by a pledge of the $6.00 CFC collections. The Authority earned CFC Revenues, as defined in the CFC Trust Agreement, of approximately $34.3 million and $33.8 million during fiscal years 2018 and 2017, respectively. These amounts include approximately $1.3 million and $0.8 million of investment income on CFC receipts during each of the fiscal years 2018 and 2017, respectively.

The CFC Trust Agreement requires that the Authority maintain a debt service coverage ratio of at least 1.3. As of June 30, 2018 and 2017, the CFC debt service coverage ratio was 2.65 and 2.60, respectively.

e) Special Facility Bonds

To provide for the construction and improvement of various facilities at Logan Airport, the Authority has four outstanding series of special facilities revenue bonds as of June 30, 2018. The Authority's special facilities revenue bonds are all special limited obligations of the Authority, and are payable and secured solely from and by certain revenues of a separate trustee. The Authority's special facilities revenue bonds do not constitute a debt or pledge of the full faith and credit of the Authority, or the Commonwealth of Massachusetts or any subdivision thereof and, accordingly, have not been reflected in the accompanying financial statements. As of June 30, 2018 and 2017, the aggregate principal amount of the Authority's special facilities revenue bonds outstanding was approximately $464.4 million and $529.4 million, respectively. The Authority has no obligation for $86.4 million of Special Facility Bonds related to BosFuel and only limited obligation for the remaining $378.0 million of special facility bonds related to Terminal A described below.

Approximately $378.0 million of the Authority's outstanding special facility bonds as of June 30, 2018 relate to the Delta Airlines Series 2001 A, B, and C bonds issued in connection with Delta Airlines construction of Terminal A. During September 2005, Delta Airlines entered into bankruptcy and as of April 2007 re-emerged out of bankruptcy. The Authority is under no obligation to assume any liability for the Terminal A Special Facility Bonds or to direct revenue, other than an obligation to remit to the trustee of the Terminal A bonds a portion of the Terminal A airline revenue, to service the debt. The Authority and Delta Airlines negotiated a restated and amended lease (the "Amended Lease") for Terminal A pursuant to which Delta Airlines reduced the number of gates that it occupied in Terminal A. The Amended Lease was approved by the bankruptcy court and was effective as of July 1, 2006 for an initial term of ten years. Effective July 1, 2016, the lease was amended to extend the term with automatic one year extensions until terminated by either party.

f) Commercial Notes Payable

The Authority's commercial notes payable as of June 30, 2018 and 2017 were as follows (in thousands):

	2018	2017
Commercial paper notes	$ 109,000	$ 125,000
Commercial paper notes issued	64,000	9,000
Principal paid on commercial paper notes	(31,000)	(25,000)
Commercial paper notes	$ 142,000	$ 109,000

In March 2014, the Authority expanded its commercial paper program to $150 million. Commercial notes payable have been issued under the terms of the 1978 Trust Agreement and are backed by the proceeds of the Improvement and Extension Fund or anticipated bond funds. The allowable maximum principal amount outstanding at any time, in the aggregate principal amount, cannot exceed the lesser of 10% of the Authority's outstanding long-term debt or $150.0 million, and is backed by a Letter of Credit Agreement with the TD Bank N.A. expiring in June 2022.

The $142.0 million and $109.0 million of the commercial notes payable as of June 30, 2018 and 2017 have been used to fund PFC eligible projects; therefore the Authority anticipates that PFC revenues will be the source to pay such redemptions. The blended interest rate on the Series 2012 A Notes was 1.485% and 1.106% during fiscal years 2018 and 2017, respectively. The blended interest rate on the Series 2012 B Notes was 1.599% and 1.189% during fiscal years 2018 and 2017, respectively. The Authority's commercial notes payable mature in July, August and September of 2018.

During fiscal year 2018 and fiscal year 2017, the Authority did not have any interest rate swaps or other interest rate hedging arrangements.

g) Arbitrage – Rebate Liability

The United States Treasury has issued regulations on calculating the rebate due to the United States Government on arbitrage liability and determining compliance with the arbitrage rebate provisions of the Tax Reform Act of 1986. Arbitrage liability arises when the Authority temporarily invests the proceeds of tax exempt debt in securities with higher yields. The Authority has no estimated liability as of June 30, 2018 and 2017, respectively.

6. Pension Plan

a) Plan Description

The Massachusetts Port Authority Employees' Retirement System (the Plan) is a single employer plan established on July 18, 1978, effective January 1, 1979, by enactment of Chapter 487 (an amendment to Chapter 32) of the General Laws of The Commonwealth of Massachusetts to provide retirement benefits for substantially all employees of the Massachusetts Port Authority (the Authority), and incidental benefits for their surviving spouses, beneficiaries and contingent annuitants. Prior to this enactment, Authority employees were members of the Commonwealth of Massachusetts Contributory Retirement System and the funding of the pension liability was on a "pay-as-you-go" method. Pursuant to this enactment, the employees' then present rights and benefits were transferred to the new retirement system. The Plan is a contributory defined benefit plan to which the Authority and its employees contribute such amounts as are necessary to provide assets sufficient to meet benefits to be paid to plan participants. The Plan is administered by the Massachusetts Port Authority Employees' Retirement System Board (the Board).

b) Benefits provided

Benefits are paid by the Plan from plan assets available for plan benefits. Plan participants are entitled at normal retirement age to benefit payments based upon length of service and earnings levels. Vesting occurs after 10 years of service.

Benefits to participants who retired prior to January 1, 1979 are paid by the Massachusetts State Board of Retirement. The Massachusetts State Board of Retirement is reimbursed for all such benefits paid after December 31, 1978 as these benefits represent obligations of the Plan.

Under Chapter 32, Section 3(8) (c), of the General Laws of The Commonwealth of Massachusetts (Chapter 32), the Plan is reimbursed for benefits paid to participants entitled to receive benefits for previous participation in other Massachusetts Chapter 32 plans. The Plan is also obligated to pay a proportionate share of benefits to participants entitled to receive benefits for subsequent participation in other Massachusetts Chapter 32 plans.

Also under Chapter 32, for members leaving the Authority's employment to work for other Massachusetts governmental units, the Plan transfers their accumulated account balances and creditable service to the retirement system of the new employer. Other such retirement systems are in turn required to make comparable transfers to the Plan for employees coming to work for the Authority.

Optional payment methods may be elected, including the contingent annuitant method, which provides for reduced payments during the life of the plan participant and continued payments to the participant's beneficiary after the death of the participant.

At January 1, 2018 and 2017, the Plan's membership consisted of:

	2018	2017
Retirees and beneficiaries receiving benefits	779	749
Terminated employees entitled to benefits but not yet receiving them	72	78
Current members:		
Active	1,268	1,245
Inactive	136	115
Total membership	2,255	2,187

c) Contributions required and contributions made

Contributions are made by the Authority based on amounts required to be funded as determined by annual actuarial valuations and are designed to fund the Plan on a level cost basis, as a percentage of pay, over the average remaining working lifetime of the active participants and to fund operating costs of the Plan. For the years ended June 30, 2018 and 2017, the Authority was required and did contribute to the Plan $13.4 million and $13.6

million, respectively. The Authority's annual contribution is made in July of each fiscal year therefore eliminating any deferred outflows related to the timing of contributions. The Authority bears the risk that plan assets might decline due to fluctuations in the fair value of the Plan's investments and contributions by the Authority will increase as part of its annual assessment.

Employees who became members prior to January 1, 1975 contribute 5% of their regular compensation through payroll deductions. Employees whose membership commenced on or after January 1, 1975 but prior to January 1, 1984 contribute 7%. Those employees whose membership began on or after January 1, 1984 but prior to July 1, 1996 contribute 8%. Employees hired after July 1, 1996 contribute 9% of their regular compensation. Employees who are hired after December 31, 1978 contribute an additional 2% of regular compensation over $30,000. These contributions accumulate and, subject to certain restrictions set forth in Chapter 32, are refundable to employees upon termination of employment by the Authority or payable to another retirement system should the employee transfer to another government unit covered by Chapter 32 of the General Laws of The Commonwealth of Massachusetts.

Contributions totaling $24.6 million ($13.4 million employer and $11.2 million employee) and $24.2 million ($13.6 million employer and $10.6 million employee) were recognized by the Plan for plan years 2017 and 2016, respectively.

d) *Investment valuation*

Investments are reported at fair value. Securities traded on a national or international securities exchange are valued at the last reported sales price on the last business day of the plan year; investments traded on a national securities exchange for which no sale was reported on that date and investments in common and preferred stocks traded in over-the-counter markets are valued at the mean of the last reported bid and asked prices, or the last reported bid price. Mutual funds and commingled funds, including real estate and alternative investments, are valued based on net asset or unit value at year-end.

e) *Pension plan fiduciary net position*

Detailed information about the Plan's fiduciary net position is available in a separately issued report. The report may be obtained by writing to the Massachusetts Port Authority Employees' Retirement System, One Harborside Drive, Suite 200S, East Boston, MA 02128-2909 or please see the Authority's website, www.massport.com.

f) *Net Pension Liability*

The components of the net pension liability of the System as of December 31, 2017 and 2016, is as follows (in thousands):

	Increase (Decrease)		
	Total Pension Liability (a)	Plan Fiduciary Net Position (b)	Net Pension Liability (a) - (b)
Balance at December 31, 2015	$ 618,537	$ 526,622	$ 91,915
Service cost	15,920	—	15,920
Interest	44,962	—	44,962
Changes between expected and actual experience	2,592	—	2,592
Changes in assumptions	(1,479)	—	(1,479)
Contributions – employer	—	13,552	(13,552)
Contributions – employees	—	10,660	(10,660)
Net investment income	—	42,565	(42,565)
Benefits payments	(28,604)	(28,604)	0
Administrative expenses	—	(1,189)	1,189
Balance at December 31, 2016	651,928	563,606	88,322
Service cost	16,419	—	16,419
Interest	47,341	—	47,341
Changes between expected and actual experience	(1,474)	—	(1,474)
Contributions – employer	—	13,362	(13,362)
Contributions – employees	—	11,242	(11,242)
Net investment income	—	92,226	(92,226)
Benefits payments	(30,731)	(30,731)	0
Administrative expenses	—	(1,149)	1,149
Balance at December 31, 2017	$ 683,483	$ 648,556	$ 34,927

g) *Actuarial Assumptions*

The total pension liability was determined by an actuarial valuation as of January 1, 2017 and update procedures were used to roll forward the total pension liability forward from the valuation date (1/1/17) to the measurement date (12/31/17). The following actuarial assumptions were applied to the periods included in the measurement for 2017 and 2016:

- *Inflation – 3.0%*
- *Salary increases – 4.5%*
- *Investment rate of return – 7.25%, net of plan investment expense*
- *Cost–of–living increases – 3.0% on a maximum base of $14,000*
- *Mortality*:
  - Healthy – RP 2000 Table (sex-distinct) projected with Scale BB and Generational Mortality. Post-retirement the RP 2000 healthy annuitant Table (sex-distinct) projected with Scale BB Generational Mortality.
  - Disabled-RP 2000 healthy annuitant Table (sex-distinct) and Generational Mortality set-forward 2 years. Mortality for accidental disability is assumed to be 50% from the same cause as the disability.
- Long-term Expected Rate of Return:

  The long-term expected rate of return on plan investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of pension plan investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation. The best estimates of geometric long-term expected real rates of return for each major asset class are summarized in the following table:

	Long-term expected real rate of return	
Asset class	**2017***	**2016***
Domestic equity	5.01 %	5.10 %
International equity	5.21	5.29
Fixed income	2.34	2.38
Real estate	5.20	4.90
Private equity	7.68	7.90

* amounts are net of inflation assumption of 2.32%

h) Discount Rate

The discount rate used to measure the total pension liability as of December 31, 2017 and 2016 was 7.25% and 7.25%, respectively. The projection of cash flows used to determine the discount rate assumed that plan member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on those assumptions, the Plan's fiduciary net position was projected to be available to make all projected further benefit payments of current plan members. Therefore, the long-term expected rate of return on the plan investments was applied to all periods of projected benefit payments to determine the total pension liability.

i) Sensitivity of the net pension liability to changes in the discount rate

The following presents the net pension liability of the Plan as of December 31, 2017 and 2016, calculated using the discount rate of 7.25% for 2017 and 2016, as well as what the net pension liability (asset) would be if it were calculated using a discount rate that is one-percentage point lower (6.25% for 2017 and 2016) or one-percentage point higher (8.25% for 2017 and 2016) than the current rate (in thousands):

Fiscal Year End	1% decrease (6.250%)	Current discount rate (7.250%)	1% increase (8.250%)
2018	$ 116,065	$ 34,927	$ (31,954)

Fiscal Year End	1% decrease (6.250%)	Current discount rate (7.250%)	1% increase (8.250%)
2017	$ 166,752	$ 88,322	$ 23,780

j) Pension expense and deferred outflows of resources and deferred inflows of resources related to pensions

For the years ended June 30, 2018 and 2017, the Authority recognized pension expense of $8.8 million and $19.7 million, respectively.

At June 30, 2018 and 2017 the Authority reported deferred outflows of resources and deferred inflows of resources related to pensions from the following sources (in thousands):

	2018		2017	
	Deferred Outflows of Resources	Deferred Inflows of Resources	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	$ 753	$ —	$ 2,446	$ —
Differences arising from the recognition of changes in assumptions	13,116	—	16,217	—
Net difference between projected and actual earnings on pension Plan investments	—	25,390	$ 18,635	—
Total	$ 13,869	$ 25,390	$ 37,298	$ —

Amounts reported as deferred outflows of resources and deferred inflows of resources related to pensions will be recognized in pension expense as follows (in thousands):

Year ended June 30:	
2019	$ 2,078
2020	741
2021	(7,923)
2022	(7,171)
2023	867
Thereafter	(113)

7. Other Postemployment Benefits (OPEB)

a) Plan Description

In addition to providing the pension benefits described in Note 6, the Authority provides post-employment health care and life insurance benefits ("OPEB") for retired employees. The OPEB Plan is a single-employer plan and offers retirees a choice of medical plans, as well as two dental plans, and basic life insurance. The benefit levels, employer contributions and future employee contributions are governed by the Authority and can be amended by the Authority.

In June 2009, the Board made changes to the plan benefits to be paid by the Authority for certain existing and future retirees. All current retired members of the Authority and all existing Authority employees who were vested as of October 1, 2009 would be eligible to have 100% of their premium cost subsidized. Employees not yet vested but employed by the Authority on October 1, 2009 would, upon retirement be eligible to receive 85% of the premium cost for benefits with the balance paid for by the retiree. For employees hired on or after October 1, 2009, the Board voted to implement a sliding scale subsidy for retiree health care premiums (ranging from 0%-85%) based on creditable service at retirement age (retirees must be age 60 or older to receive the subsidy), and whether or not the employee retired within sixty days after leaving the Authority. The Board also voted to eliminate retiree dental and life insurance coverage, as well as Medicare Part B premium subsidy for this group of employees.

In May 2016, the Board made changes to the plan benefits to be paid by the Authority for certain future retirees. Persons who commenced employment with the Authority during the period from October 1, 2009 through May 25, 2016, and who, as of the date such employment commenced, had accrued ten (10) years or more of creditable service pursuant to M.G.L.c. 32, would upon retirement, be eligible to receive 80% of the premium cost for those benefits with the balance paid for by the retiree; provided, however, that employees who retire with at least thirty (30) years of creditable service would be eligible to receive 85% of the premium cost of such benefits with the balance paid for by the retiree. For purposes of calculating the percentage of the subsidy (80% or 85%), years of creditable service shall be calculated at separation from employment with the Authority. The spouse and dependents of eligible retirees will qualify for the same premium subsidy and retiree health benefits as the retiree. Eligible retirees, but not their spouse or dependents, will also qualify for a 100% subsidy from the Authority for retiree basic life insurance.

b) Benefits provided

The medical plans are either HMOs, PPOs or indemnity plans, and some are designed to work with Medicare benefits, such a Medicare supplement or Medicare HMO plans. The basic life insurance provides a $5,000 death benefit to the retiree. Spouses and dependents are not eligible for this death benefit upon their death. To comply with the requirements of GASB No. 75, the Authority performed an actuarial valuation at January 1, 2017, and used June 30, 2017 as the measurement date. The Authority issues publicly available audited financial statements for the Trust. The report may be obtained by writing to the Massachusetts Port Authority, Attn: John P. Pranckevicius, CPA, Director of Administration and Finance and Secretary-Treasurer, One Harborside Drive, Suite 200S, East Boston, MA 02128-2909. Those statements are prepared with an "economic resources" measurement focus on the accrual basis of accounting in accordance with U.S generally accepted accounting principles. Employer contributions are recognized when the employer has made formal commitments to provide the contributions and benefits are recorded when due and payable in accordance with the terms of the Trust. Investments are reported at fair value. Mutual funds and commingled funds are valued based on fair value and alternative investments are valued based on net asset or unit value at year-end. The Trust did not own any individual securities and no long term contracts for contributions to the Trust existed at June 30, 2018 or 2017.

At June 30, 2018 and 2017, the Trust's membership consisted of:

	2018	2017
Active Employees		
Pre-Medicare (hired prior to 3/31/1986)	57	74
Post-Medicare (hired after 3/31/1986)	1,234	1,205
Total	1,291	1,279
Inactive Participants (Vested)	65	68
Retired, Disabled, Survivors and Beneficiaries	935	903
Total Membership	2,291	2,250

c) Contributions required and contributions made

Contributions are made by the Authority based on amounts required to be funded as determined by annual actuarial valuations and are designed to fund the Trust on a level cost basis, and to fund operating costs of the Trust. For the years ended June 30, 2017 and 2016, the Authority contributed to the Trust $14.3 million and $12.0 million, respectively and these amounts are recorded in the Statement of Net Position as a deferred outflow of resources as of June 30, 2017 and July 1, 2016. The Authority's annual contribution is made monthly throughout the fiscal year. The Authority bears the risk that trust assets might decline due to fluctuations in the fair value of the Trust's investments and contributions by the Authority will increase as part of its annual assessment.

d) OPEB Trust deposits and investments

i) OPEB Trust Investment Policy

The Trust's investments are made in accordance with the provisions of the Trust Investment Policy (the "Investment Policy") which was adopted on May 8, 2009 and amended on December 8, 2014 by the Retiree Benefits Trust Committee (the "Committee").

The goals of the Investment Policy are to invest for the sole purpose of funding the OPEB Plan obligation of the Authority in a prudent manner, and to conserve and enhance the value of the Trust assets through appreciation and income generation, while maintaining a moderate investment risk. In addition, the investment policy was developed to achieve a long-term return commensurate with contemporary economic conditions and equal to or exceed the investment objectives set forth in the investment policy, currently set at 7.25%.

The Trust has retained an investment consultant to work in a fiduciary capacity to ensure that strategic investment diversification is attained, to employ investment managers with expertise in their respective asset classes, and to closely monitor the implementation and performance of the respective investment strategies.

The Trust is currently invested in commingled funds which hold stocks (domestic and international) and fixed income securities and a REIT index fund. Additionally, during FY 2016, the Trust invested in two private equity real estate funds. The exposure limits per the Trust Investment Policy are as follows:

			Asset Weightings (as of December 8, 2014)		
Asset Class	**Exposure**	**Exposure**	**Minimum Exposure**	**Maximum Exposure**	**Target Allocation**
Domestic equity	39.8%	38.1%	28%	48%	38.0%
Fixed income	30.6%	33.5%	17%	47%	32.0%
International equity	20.0%	19.2%	10%	30%	20.0%
Cash and cash equivalents	0.2%	1.0%	0%	20%	10.0%
Alternatives:			0%	15%	7.5%
REIT index fund	2.8%	3.2%			
Real estate private equit	6.6%	5.0%			
Total Alternatives	9.4%	8.2%			

The current investment philosophy represents a long-term perspective. When asset weightings fall outside the Investment Policy Range, the investment advisor shall advise the Committee on potential investment courses of action and the Committee may elect to rebalance the Trust asset mix.

The following summarizes the Trust's cash, cash equivalents and investments by type held at June 30, 2017 and 2016 (in thousands):

	Credit Rating		2017 Fair Value	Credit Rating		2016 Fair Value
Cash and Cash Equivalents						
MMDT	Unrated	$	1,525	Unrated	$	870
First American Government Fund	Unrated		120	Unrated		200
US Bank Money Market Fund			—	Unrated		551
Total Cash and Cash Equivalents		$	1,645		$	1,621
Investments						
Vanguard Index Funds	Unrated	$	107,429	Unrated	$	93,263
Vanguard Total Bond Market Fund	AA		18,946	AA		20,794
Vanguard Intermediate Term Investment Grade Fund	A		9,558	A		6,308
Vanguard Short Term Bond Index Fu	AA		8,234	AA		12,032
Aberdeen Emerging Markets Fund	Unrated		7,958	Unrated		5,115
Alliance Bernstein High Income	BBB		9,475	BBB		6,179
TCW Emerging Markets Income	BB		4,624	BB		4,054
PL Floating Rate Income Fund	B		5,487	B		5,114
Real Estate Private Equity Funds	Unrated		12,235	Unrated		8,060
Total Investments		$	183,946		$	160,919

The following discusses the Trust's exposure to common deposit and investment risks related to custodial credit, credit, concentration of credit, interest rate and foreign currency risks as of June 30, 2017 and 2016.

ii) Custodial Credit Risk

Custodial credit risk is the risk that, in the event of a failure of a depository financial institution, the Trust's deposits may not be returned. Investment securities are exposed to custodial credit risk if the securities are uninsured, are not registered in the name of the Trust and are held by either the depository financial institution or the depository financial institution's trust department or agent but not in the Trust's name.

The Trust manages custodial credit risk by limiting its investments to highly rated institutions and or requiring high quality collateral be held by the Trustee in the name of the Trust. All investments are held by a third party in the Trust's name. These investments are recorded at fair value.

Additionally, the Trust is authorized to invest in the Massachusetts Municipal Depository Trust (MMDT), a pooled money market like investment fund managed by the Commonwealth of Massachusetts, established under the General Laws, Chapter 29, Section 38A. MMDT investments are carried at amortized cost, which approximates fair value which is the same as the value of the pool. The Trust can purchase and sell its investments in this fund at any time without penalty.

iii) Credit Risk

Credit risk exists when there is a possibility the issuer or other counterparty to an investment may be unable to fulfill its obligations.

For the years ended June 30, 2017 and 2016, the Trust's fixed income investments totaled $56.3 million and $54.4 million, respectively. At June 30, 2017 and 2016, these investments were split between six commingled mutual funds. The investment policy limits fixed income securities of any one issuer to below 5% of the total bond portfolio at the time of purchase and this limitation does not apply to issues of the U.S. Treasury or other Federal Agencies. The diversification restrictions for individual stocks and fixed income securities purchased and held in the total portfolio shall not apply to similar investment instruments held in a commingled fund or an SEC registered mutual fund specifically approved by the Committee. The Trust invests primarily commingled funds and SEC registered mutual funds. The overall rating of the fixed income assets, as calculated by the Advisor, shall be investment grade, based on the rating of one Nationally Recognized Statistical Rating Organization. In cases where the yield spread adequately compensates for additional risk, investments classified at below investment grade can be purchased or held to maturity up to a maximum of 30% of the total market value of the fixed income securities of the Fund. The percentage of the fixed income portfolio below investment grade at June 30, 2017 and 2016 was 22.72% and 20.34%, respectively.

iv) Concentration of Credit Risk

Concentration of credit risk is the risk of loss that may be attributed to the magnitude of the Trust's investment in a single issuer. Investments of Trust assets are diversified in accordance with the Investment Policy that defines rules for the funds, including having no stock holding or fixed income holding with a 5% or greater portfolio weighting (except U.S. Treasury or securities backed by the federal government), holding no more than 2% of the outstanding shares of an individual stock, and holding no more than 25% of the portfolio in any one industry. Trust assets were in compliance with the Investment Policy at June 30, 2017 and 2016, respectively.

v) Interest Rate Risk

Interest rate risk is the risk that changes in interest rates will adversely affect the fair value of an investment. This risk is confined to the fixed income and cash portions of the portfolio and is managed within the portfolio using the effective duration methodology. This methodology is widely used in the management of fixed income portfolios in that it quantifies to a much greater degree the risk of interest rate changes. The weighted duration of the fixed income portfolio at June 30, 2017 and 2016 was 4.68 and 4.32 years, respectively.

The individual fund durations are as follows at June 30, 2017 and 2016, respectively:

		2017 Fair Value	Effective Duration		2016 Fair Value	Effective Duration
Fixed Income Investments						
Vanguard Total Bond Market Fund	$	18,947	6.10	$	20,794	5.50
Vanguard Intermediate Term Investment Grade Fund		9,558	5.50		6,308	5.50
Vanguard Short Term Bond Index Fund		8,234	2.80		12,032	2.70
Alliance Bernstein High Income		9,475	4.18		6,179	3.96
TCW Emerging Markets Income		4,624	6.72		4,054	6.72
PI Floating Rate Income Fund		5,487	0.33		5,114	0.36
Total Fixed Income Investments	$	56,325		$	54,481	

vi) Foreign Currency Risk

Foreign currency risk is the risk that changes in exchange rates will adversely impact the fair value of an investment. The Trust invests in funds that hold stocks in either emerging or developed markets outside of the United States that may have an impact on the fair value of the investments and thus contribute currency risk due to their international equity holdings.

vii) Rate of Return

As required per GASB Statement 74, , the annual money weighted rate of return on trust investments, net of trust expenses was 11.88% and 1.53% for the years ended June 30, 2017 and 2016, respectively. The money weighted rate of return expresses investment performance net of investment expenses adjusted for the changing amounts actually invested. The Trust's annual rate of return, measured for financial performance purposes, was 12.1% and 1.7%, gross of fees, for fiscal years 2017 and 2016, respectively.

viii) Fair Value Measurement

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Fair value is a market-based measurement, not an entity-specific measurement. For some assets and liabilities, observable market transactions or market information might be available; for others, it might not be available. However, the objective of a fair value measurement in both cases is the same—that is, to determine the price at which an orderly transaction to sell the asset or to transfer the liability would take place between market participants at the measurement date under current market conditions. Fair value is an exit price at the measurement date from the perspective of a market participant that controls the asset or is obligated for the liability.

The fair value hierarchy categorizes the inputs to valuation techniques used to measure fair value into three levels. Level 1 inputs are quoted prices (unadjusted) for identical assets or liabilities in active markets that a government can access at the measurement date. Level 2 inputs are inputs other than quoted prices included within Level 1 that are observable for an asset or liability, either directly or indirectly. Level 3 inputs are unobservable inputs for an asset or liability. The fair value hierarchy gives the highest priority to Level 1 inputs and the lowest priority to Level 3 inputs.

The Trust has the following fair value measurements for investments at June 30, 2017 and 2016:

Investments Measured by Fair Value Level ($ 000)

As of June 30, 2017	**Fair Value**	**Level 1**	**Level 2**	**Level 3**
Investments				
Vanguard Index Funds	$ 107,429	$ 107,429	$ -	$ -
Vanguard Total Bond Market Fund	18,946	18,946	-	-
Vanguard Intermediate Term Investment Grade Fund	9,558	9,558	-	-
Vanguard Short Term Bond Index Fund	8,234	8,234	-	-
Aberdeen Emerging Markets Fund	7,958	7,958	-	-
AllianceBernstein High Income	9,475	9,475	-	-
TCW Emerging Markets Income	4,624	4,624	-	-
PI Floating Rate Income Fund	5,487	5,487	-	-
Total investments measured by fair value level	171,711	171,711	-	-
Investments Measured at the Net Asset Value (NAV)				
Real Estate Private Equity Funds:				
Boyd Watterson GSA Fund	5,592			
Equus Fund X	6,643			
Total investments measured at the NAV	12,235			
Total Investments	$ 183,946	$ 171,711	$ -	$ -

Investments Measured by Fair Value Level ($ 000)

As of June 30, 2016	Fair Value	Level 1	Level 2	Level 3
Investments				
Vanguard Index Funds	$ 93,263	$ 93,263	$ -	$ -
Vanguard Total Bond Market Fund	20,794	20,794	-	-
Vanguard Intermediate Term Investment Grade Fund	6,308	6,308	-	-
Vanguard Short Term Bond Index Fund	12,032	12,032	-	-
Aberdeen Emerging Markets Fund	5,115	5,115	-	-
AllianceBernstein High Income	6,179	6,179	-	-
TCW Emerging Markets Income	4,054	4,054	-	-
PI Floating Rate Income Fund	5,114	5,114	-	-
Total investments measured by fair value level	152,859	152,859	-	-
Investments measured at the net asset value (NAV)				
Real Estate Private Equity Funds:				
Boyd Watterson GSA Fund	5,120			
Equus Fund X	2,940			
Total investments measured at the NAV	8,060			
Total investments	$ 160,919	$ 152,859	$ -	$ -

Comingled Mutual Funds

As of June 30, 2017 and 2016, the Authority held positions in several comingled mutual funds as noted above and the fair values were $171.7 million and $152.9 million, respectively. The fair values of the comingled mutual funds were valued using quoted market prices (Level 1).

The valuation method for investments measured at the net asset value (NAV) per share or its equivalent is presented in the following table:

	Investments Measured at NAV ($000)						
					Unfunded	Redemption	Redemption
		2017		2016	Commitments	Frequency	Notice Period
Real Estate Private Equity Funds							
Boyd Watterson GSA Fund (	$	5,592	$	5,120	—	—	60 days
Equus Fund X(2)		6,643		2,940	—	—	—
Total investments measured at the NAV	$	12,235	$	8,060			

1 This fund invests primarily in real estate leased to the U.S. federal government. The fair value of the investment has been determined using the NAV per share (or its equivalent) of the Fund's ownership interest in partners' capital. The Trust can withdraw from the fund with 60 days notice prior to a calendar quarter end and the minimum withdrawal of $250,000.

2 This fund invests in U.S. commercial real estate. The fair value of the investment has been determined using the NAV per share (or its equivalent) of the Fund's ownership interest in partners' capital. The Partnership agreement stipulates a partnership dissolution on a date five years after the end of the Investment Period; provided, however, that the General Partner may, in its sole discretion, extend the term for up to two additional one year periods.

e) *Net OPEB Liability*

The total OPEB liability at June 30, 2018 was determined by an actuarial valuation as of January 1, 2017 and update procedures were used to roll forward the total OPEB liability from the valuation date (1/1/17) to the measurement date (6/30/17). The total OPEB liability at June 30, 2017 was determined by an actuarial valuation as of January 1, 2016 and update procedures were used to roll backward the total OPEB liability from the valuation date (1/1/16) to the measurement date (6/30/16).

The components of the net OPEB liability of the Trust as of June 30, 2018 and 2017, is as follows (in thousands):

	Increase (Decrease)		
	Total OPEB Liability (a)	**Trust Fiduciary Net Position (b)**	**Net OPEB Liability (a) - (b)**
Balance at June 30, 2016	$ 279,789	$ 158,630	$ 121,159
Service cost	5,891	—	5,891
Interest	20,285	—	20,285
Contributions – employer	—	13,340	(13,340)
Contributions – employees	—	209	(209)
Difference between expected and actual experience	18,841	—	18,841
Net investment income	—	2,348	(2,348)
Benefits payments	(11,987)	(11,987)	—
Administrative expenses	—	(172)	172
Balance at June 30, 2017	$ 312,819	$ 162,368	$ 150,451
Service cost	6,405	—	6,405
Interest	22,693	—	22,693
Contributions – employer	—	15,787	(15,787)
Contributions – employees	—	248	(248)
Net investment income	—	19,829	(19,829)
Benefits payments	(12,643)	(12,643)	—
Administrative expenses	—	(173)	173
Balance at June 30, 2018	$ 329,274	$ 185,416	$ 143,858

f) Actuarial Assumptions

The following actuarial assumptions were applied to the periods included in the measurement for 2017 and 2016:

- *Inflation – 3.0%*
- *Salary increases – 4.5%*
- *Investment rate of return – 7.25%, net of Trust investment expense*
- *Health care trend rates – Initial annual health care cost trend rate range from 1.1% to 9.0% which decrease to a long-term trend rate between 5.0% and 6.0% for all health care benefits after ten years. The initial annual dental cost trend rates range from 0.0% to 7.0% which decrease to a long-term trend rate between 5.0% and 5.3% for all dental benefits after 10 years.*
- *Mortality*:
  - Healthy – RP 2000 Table (sex-distinct) projected with Scale BB and Generational Mortality. Post-retirement the RP 2000 healthy annuitant Table (sex-distinct) projected with Scale BB Generational Mortality.
  - Disabled-RP 2000 healthy annuitant Table (sex-distinct) and Generational Mortality set-forward 2 years. Mortality for accidental disability is assumed to be 50% from the same cause as the disability.
- *Other information:*

  As of January 1, 2016, employees hired after September 30, 2009 are not eligible for post-retirement medical insurance until age 60 with 10 year of service.

  As of January 1, 2013, the mortality assumption was changed to the RP2000 Table and the retirement, disability and withdrawal assumptions were changed based on an experience study.

- Long-term Expected Rate of Return:

  The long-term expected rate of return on Trust investments was determined using a building-block method in which best-estimate ranges of expected future real rates of return (expected returns, net of OPEB Trust investment expense and inflation) are developed for each major asset class. These ranges are combined to produce the long-term expected rate of return by weighting the expected future real rates of return by the target asset allocation percentage and by adding expected inflation.

The best estimates of arithmetic long-term expected real rates of return for each major asset class are summarized in the following table:

Asset class	Long-term expected real rate of return 2017	2016
Domestic equity		
Vanguard Total Stock Market Index	6.48 %	6.48 %
Fixed income		
Vanguard Total Bond Market Fund	3.13	3.13
Vanguard Short Term Bond Index Fund	3.13	3.13
Vanguard Intermediate Term Investment Grade	4.00	4.00
Alliance Bernstein High Income	4.75	4.75
PI Floating Rate Income Fund	2.89	2.89
TCW Emerging Markets Income	5.25	5.25
International equity		
Vanguard Total International Stock Index	6.65	6.65
Vanguard Developed Market Stock Index	6.65	6.65
Aberdeen Emerging Markets Fund	7.20	7.63
Cash and cash equivalents	0.75	0.75
Alternatives		
REIT index fund	4.62	4.62
Real estate private equity	7.65	7.65

g) Discount Rate

The discount rate used to measure the total OPEB liability as of June 30, 2018 and 2017 was 7.25%, respectively. The projection of cash flows used to determine the discount rate assumed that Trust member contributions will be made at the current contribution rate and that employer contributions will be made at rates equal to the difference between actuarially determined contribution rates and the member rate. Based on those assumptions, the Trust’s fiduciary net position was projected to be available to make all projected further benefit payments of current Trust members. Therefore, the long-term expected rate of return on the plan investments was applied to all periods of projected benefit payments to determine the total OPEB liability.

h) Sensitivity of the net OPEB liability to changes in the discount rate

The following presents the net OPEB liability of the Authority as of June 30, 2018 and 2017, calculated using the discount rate of 7.25% for 2018 and 2017, as well as what the net OPEB liability (asset) would be if it were calculated using a discount rate that is one-percentage point lower (6.25% for 2018 and 2017) or one-percentage point higher (8.25% for 2018 and 2017) than the current rate (in thousands):

Fiscal Year End	1% decrease (6.250%)	Current discount rate (7.250%)	1% increase (8.250%)
2018	$ 192,188	$ 143,858	$ 105,549

Fiscal Year End	1% decrease (6.250%)	Current discount rate (7.250%)	1% increase (8.250%)
2017	$ 196,996	$ 150,451	$ 113,564

i) Sensitivity of the Net OPEB Liability to Changes in Health Care Cost Rates

The following presents the net OPEB liability of the Authority as of June 30, 2018 and 2017, calculated using healthcare cost trend rates of 9.0% decreasing to 5.0% as well as what the net OPEB liability (asset) would be if it were calculated using a health care cost trend rate that is one-percentage point lower or one-percentage point higher than the current rate:

Fiscal Year End	1% decrease (8.0% decreasing to 4.0%)	Healthcare Cost Trend rate (9.0% decreasing to 5.0%)	1% increase (10.0% decreasing to 6.0%)
2018	$ 100,533	$ 143,858	$ 199,282

Fiscal Year End	1% decrease (8.0% decreasing to 4.0%)	Healthcare Cost Trend rate (9.0% decreasing to 5.0%)	1% increase (10.0% decreasing to 6.0%)
2017	$ 111,339	$ 150,451	$ 200,379

j) OPEB expense and deferred outflows of resources and deferred inflows of resources related to OPEB

For the years ended June 30, 2018 and 2017, the Authority recognized OPEB expense of $20.2 million and $19.2 million, respectively.

At June 30, 2018 and 2017 the Authority reported deferred outflows of resources and deferred inflows of resources related to OPEB from the following sources (in thousands):

	2018		2017	
	Deferred Outflows of Resources	Deferred Inflows of Resources	Deferred Outflows of Resources	Deferred Inflows of Resources
Differences between expected and actual experience	$ 13,292	$ —	$ 16,066	$ —
Net difference between projected and actual earnings on OPEB investments	—	831	7,363	—
OPEB contribution subsequent to measurement date	15,682	—	14,300	—
Total	$ 28,974	$ 831	$ 37,729	$ —

In accordance with GASB Statement No. 75, the Authority reported $15,682 as deferred outflows of resources related to the Authority's OPEB contribution subsequent to the measurement date and will be recognized as a reduction of the net OPEB liability in the year ended June 30, 2019. Amounts reported as deferred outflows of resources and deferred inflows of resources related to OPEB will be recognized in OPEB expense as follows (in thousands):

Year ended June 30:	
2019	$ 3,027
2020	3,027
2021	3,027
2022	1,187
2023	2,193

8. Leases

a) Commitments

The Authority has commitments under various operating leases, which contain escalation clauses, as lessee. The following is a schedule by years of minimum rental payments under noncancelable operating leases as of June 30, 2018 (in thousands):

Years	Amount	Years	Amount
2019	$ 2,168	2039 – 2043	$ 4,880
2020	1,708	2044 – 2048	4,880
2021	1,488	2049 – 2053	4,880
2022	1,432	2054 – 2058	4,880
2023	1,432	2059 – 2063	4,880
2024 – 2028	5,792	2064 – 2068	4,880
2029 – 2033	4,880	2069 – 2072	2,602
2034 – 2038	4,880		
		Total	$ 55,662

Rent expense and other operating lease related payments were $6.9 million and $10.9 million for fiscal years 2018 and 2017, respectively.

b) Rental Income

The Authority leases a major portion of its Aviation and Port properties to various tenants. Many of these operating leases provide for periodic adjustments to rental rates, including certain provisions for contingent payments based on specified percentages of the tenant's gross revenue.

The following is a schedule by years of minimum future rental income on noncancelable operating leases as of June 30, 2018 (in thousands):

Years	Amount	Years	Amount
2019	$ 96,451	2054 – 2058	$ 60,616
2020	83,375	2059 – 2063	64,031
2021	77,826	2064 – 2068	65,809
2022	69,084	2069 – 2073	69,978
2023	60,076	2074 – 2078	72,048
2024 – 2028	195,128	2079 – 2083	76,099
2029 – 2033	102,620	2084 – 2088	67,491
2034 – 2038	92,358	2089 – 2093	69,553
2039 – 2043	93,005	2094 – 2098	64,439
2044 – 2048	76,899	2099 – 2103	4,154
2049 – 2053	62,061	2104 – 2107	1,401
		Total	$ 1,624,502

Rental income and concession income, including contingent payments received under these provisions, were approximately $386.2 million and $341.9 million for the fiscal years 2018 and 2017, respectively.

9. Risk Management

The Authority, as mandated by the 1978 Trust Agreement, maintains a self insurance account for general liability and workers compensation within the Operating Fund. The self insurance accruals are determined based on insurance claim history and actuarial estimates needed to pay prior and current-year claims. The accrued liability was approximately $8.1 million as of June 30, 2018 and 2017, respectively, and is included as a component of accrued expenses in the accompanying financial statements. This liability is fully funded as of June 30, 2018 and 2017.

Changes in the accrued liability accounts, related to self insurance, in fiscal year 2018, 2017 and 2016 were as follows (in thousands):

	2018	2017	2016
Liability balance, beginning of year	$ 8,053	$ 7,986	$ 7,625
Provision to record estimated losses	3,538	3,308	2,706
Payments	(3,516)	(3,241)	(2,345)
Liability balance, end of year	$ 8,075	$ 8,053	$ 7,986

As part of its normal operations, the Authority encounters the risk of accidental losses stemming from third party liability claims, property loss or damage, and job related injuries and illnesses. In managing these loss exposures, a combination of risk management measures is applied, including safety and loss prevention programs, emergency planning, contractual risk transfer, self insurance, and insurance.

In connection with the self insurance and insurance programs, the Authority retains part of the losses incurred and internally manages the self insured claims. The self insured retention currently includes: $1.0 million for worker's compensation per job related accident for Massport employees and International Longshoreman's Association Members; $1,000 per occurrence for automobile liability; aviation general liability and airport terrorism insurance; $0.25 million for airside incidents and for non-airside auto losses; $25 thousand for Comprehensive Marine Liability, Terminal Operator's Liability, Stevedore's liability; and $0.25 million for property losses per occurrence. Insurance is purchased above the self-insured amounts, subject to availability and the reasonableness of cost. Liabilities for self insured claims are reported if it is probable that a loss has been incurred and the amount can be reasonably estimated. These losses include an estimate of claims that have been incurred but not reported at year-end and are based on the historical cost of settling similar claims. The Authority records such liabilities as accrued expenses. The Authority from time to time is engaged in various matters of routine litigation. These matters include personal injury and property damage claims for which the Authority's liability is covered in whole or in part by insurance. The Authority does not expect that these matters will require any amounts to be paid which in the aggregate would materially affect the financial statements.

Settled claims resulting from the risks discussed above have not exceeded the amount of insurance coverage in force in any of the past three fiscal years. Further, insurance maintained in fiscal years 2018 and 2017 has not changed significantly from prior periods.

10. Payments in Lieu of Taxes

The Authority's Enabling Act and the 1978 Trust Agreement authorize and directs the Authority, subject to certain standards and limitations, to enter into agreements to make annual payments in lieu of taxes to the City of Boston and the Town of Winthrop (collectively, the "PILOT Agreements").

The PILOT Agreements provide that annual payments may not exceed the balance of revenues remaining after deposits to pay operating expenses, required deposits to the Interest and Sinking Fund and required deposits to the Maintenance Reserve Fund.

Pursuant to the terms of the amended Boston PILOT Agreement (the "Amended Boston PILOT Agreement"), the term of the Amended Boston PILOT Agreement terminates on June 30, 2022 subject to (1) mutual rights annually to terminate the Amended Boston PILOT Agreement and (2) automatic one year extensions of the term each July 1. In November 2016, the City of Boston notified the Authority of its election to terminate the Boston PILOT Agreement on June 30, 2022, and the parties expect to commence negotiations on a successor agreement or an amendment to the existing agreement. The Amended Boston PILOT Agreement provides for the Authority to pay (i) an annual base amount (the "Base Amount") of $14.0 million, which, commencing in fiscal year 2007, increases annually by the annual percentage change in the consumer price index, provided that such increase shall be no less than 2% nor greater than 8% per year, (ii) for ten years ending in fiscal year 2016, an amount of $700,000, which shall not be increased or adjusted, and (iii) a community portion (the "Community Portion").

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

PILOT expenses to the City of Boston for fiscal years 2018 and 2017 were $19.0 million and $18.4 million, respectively. PILOT expenses to the Town of Winthrop for fiscal years 2018 and 2017 were $0.9 million for each year.

11. Commitments

a) *Contractual Obligations for Construction*

The Authority enters into construction contracts with various construction and engineering companies. Construction contracts outstanding were approximately $261.8 million and $304.5 million as of June 30, 2018 and 2017, respectively.

b) *Seaport Bond Bill*

The Seaport Bond Bill was enacted in 1996 and among other things, provides for funding improvements to the Massachusetts rail transportation network allowing rail shipment of double stack cargo from Allston Yards in Boston to points west, which is anticipated to encourage expanded container shipments through the Port of Boston. The Seaport Bond Bill requires that the Authority provides up to fifty percent (50%) of the cost of improvements to the rail line from Framingham to the Allston Yard in Boston permitting double stack shipments. Expenditure of funds will not occur until the execution of a Master Agreement, as defined by the statute, between the Commonwealth and the participating railroads. The Authority believes that the likelihood that any such Master Agreement will be executed and Authority funds committed for double stack improvements within the next fiscal year is remote.

c) *Boston Harbor Dredging Project*

During fiscal year 2018, the Authority entered into an agreement with the Department of the Army and the Commonwealth of Massachusetts, Department of Transportation related to the Boston Harbor Deep Draft Improvement Project and the construction of the Dredged or excavated Material Facility at Boston Harbor, Massachusetts. This project includes the deepening and widening of the Broad Sound North Channel to 51 feet, the deepening and widening of the Main Ship Channel (MSC) and turning basin to 47 feet. The non-federal share is split between the Authority and the Commonwealth. The project is expected to be completed in fiscal year 2022.

12. Litigation

The Authority is engaged in numerous matters of routine litigation. These matters include personal injury and property damage claims for which the Authority's liability is covered in whole or in part by insurance. Others include such matters as disputes with contractors, subcontractors, engineers and others arising out of construction and maintenance of the Authority's properties; disputes over leases and concessions; property, theft and damage claims arising from the Authority's operations, employment matters and workers compensation, as to which the Authority is self-insured. The Authority does not expect that these matters will require any amounts to be paid which, in the aggregate, will be material to the results of operations.

13. Pollution Remediation Obligation

The Authority is currently involved in six separate pollution remediation obligations that meet the requirements for accounting treatment under GASB Statement No. 49, *Accounting and Financial Reporting for Pollution Remediation Obligations* ("GASB No. 49"). These obligations are generally related to the removal and/or treatment of contaminated soil, groundwater and petroleum products associated with fuel storage and conveyance. GASB No. 49 dictates that for each obligating event, an estimate of the expected pollution remediation outlays is required to be accrued as a liability and expensed in the current period. Re-measurement of the liability is required when new information indicates increases or decreases in estimated outlays.

The estimated liability as of June 30, 2018 and 2017 is $4.6 million and $1.2 million, respectively, which represents the approximate amounts the Authority expects to pay for future remediation activities. The Authority paid approximately $0.8 million and $1.1 million in fiscal years 2018 and 2017, respectively. This estimate was generated using input and guidance from internal management and professional consultants, and represents a wide array of remediation activities ranging from onetime events to longer-term sustained monitoring activity. The Authority will continue to closely monitor each of these obligations, working toward regulatory closure, and will make any necessary adjustments to the potential liability as new information becomes available.

14. Interagency Agreements

a) Investment in Joint Venture

In May 1996, the Authority entered into an interagency agreement with the Massachusetts Highway Department ("MHD") and Massachusetts Bay Transportation Authority ("MBTA") for the construction of a Regional Transportation Center ("RTC") in Woburn, Massachusetts ("Interagency Agreement"). Under the terms of the Interagency Agreement, the Authority has paid one third of the costs of acquiring the site and constructing the RTC and will share in a like proportion in the profits and losses of the RTC. During fiscal years 2018 and 2017, the Authority recognized income of approximately $0.3 million and $0.2 million, respectively, representing its share of the earnings of the RTC.

b) Logan Airport Silver Line Transportation Agreement

In December 2005, the Authority entered into a ten year agreement with the MBTA to provide public transportation between South Station in Boston, Massachusetts and Logan Airport along a route called the Silver Line. Pursuant to this agreement, the Authority purchased eight buses at a cost of $13.3 million, and the MBTA agreed to operate and maintain the Authority's Silver Line buses for a cost of $2.0 million per year, paid in equal monthly installments. In August 2015, this agreement was extended for an additional five year period and modified to provide that the Authority would be responsible for paying the FAA approved rate of 76.06% of the costs to operate and maintain the Silver Line buses and 76.06% of the costs of the future rebuild of the Silver Line buses. During fiscal years 2018 and 2017, the estimated costs to operate and maintain the Silver Line buses was

$2.86 million and $3.0 million, respectively, and the Authority also incurred expenses of $1.8 million and $2.5 million, respectively, to rebuild four Silver Line Buses in each year.

15. Subsequent Events

a) Bond Offering

In February 2018, the Board authorized the issuance and sale of up to $107.5 million of subordinated obligations, Series 2018 – A (AMT) to finance the design and construction of Berth 10 and the acquisition of 3 STS cranes. This transaction is expected to close in the fourth quarter of calendar 2018.

MASSACHUSETTS PORT AUTHORITY

Required Supplementary Information (Unaudited)

Schedule of Pension Contributions

June 30, 2018

(In thousands)

	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009
Actuarially determined contribution	$ 13,362	$ 13,552	$ 10,845	$ 11,146	$ 11,960	$ 9,594	$ 5,710	$ 4,924	$ 7,621	$ 401
Actual contribution in relation to the actuarially determined contribution	13,362	13,552	10,845	11,146	11,960	9,594	5,710	4,924	7,621	401
Contribution deficiency (excess)	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Covered payroll	$ 110,173	$ 106,444	99,190	$ 94,340	$ 90,042	$ 87,476	$ 85,941	$ 89,950	$ 89,704	$ 85,120
Contributions as a percentage of covered payroll	12.1%	12.7%	10.9%	11.8%	13.3%	11.0%	6.6%	5.5%	8.5%	0.5%

Notes to Schedule

Valuation date: Actuarially determined contribution rates are calculated annually as of January 1, 18 months prior to the end of the fiscal year in which the contributions are reported. Contributions are made on July 1, of each year.

Methods and assumptions used to determine contribution rates:

Actuarial cost method	Frozen entry age
Amortization method	20 Level dollar, closed
Remaining amortization period	Multiple bases with remaining periods from 8 to 20 years
Asset valuation method	Beginning in 2008, fair value of assets using a five year smoothing period. Prior to 2008, used four year asset smoothing period
Inflation rate	3.0%
Salary increases	2013 valuation: 4.5%; 2009 valuation: 4.75; prior to 2009: 5.00%
Investment rate of return	2016 valuation 7.25%; 2015 valuation: 7.5%; 2012 valuation: 7.625%; 2010 valuation: 7.75%; 2009 valuation: 8.0%; prior to 2009: 7.75%
Retirement age	In the 2013 valuation, additional retirement assumptions were added for employees hired after April 1, 2012 and subject to pension reform and the assumption was changed due to an experience study. In the 2008 valuation the retirement assumption was extended to age 70 for Group 1 employees.
Disability and withdrawal	Changed in the 2013 valuation due to an experience study.
mortality	In the 2013 valuation, mortality was changed to RP2000 projected generationally with scale BB In the 2012 valuation, mortality was changed to RP2000 projected 22 years using scale AA. In the 2009, 2010 and 2011 valuations mortality was changed to RP2000 projected nine, ten and eleven years, respectively, using scale AA.

Other information

As of January 1, 2016, employees hired after September 30, 2009 and not eligible for post-retirement medical insurance until age 60, retirement age begins at age 60 with 10 years of service.

As of January 1, 2013, the mortality assumption was changed to the RP2000 Generational Table and the retirement, disability and withdrawal assumptions were changed based on an experience study.

As of January 1, 2012, the mortality assumption was changed to the RP2000 Table projected forward 22 years with Scale AA, interest rate changed to 7.625% (from 7.75%) and salary rate to 4.50% (from 4.75%). Vacation buyback factor was increased from 1.00% to 1.25%.

As of January 1, 2011, the mortality assumption was changed to the RP2000 Table projected forward 11 years with Scale AA.

As of January 1, 2010, the mortality assumption was changed to the RP2000 Table projected forward 10 years with Scale AA, interest rate was changed to 7.75% (from 8.00%).

As of January 1, 2009, the mortality assumption was changed to the RP2000 Table projected forward 9 years with Scale AA, interest rate was changed to 8.00% (from 7.75%), salary rate was changed to 4.75% (from 5.00%), contribution timing was changed to the beginning of the fiscal year from monthly.

As of January 1, 2008, the retirement age assumption was extended to age 70 for Group 1 employees, disabled mortality changed to a 2 year set forward and the asset valuation method was changed to a 5 year smoothing.

MASSACHUSETTS PORT AUTHORITY

Required Supplementary Information (Unaudited)

Schedule of Changes in the Net Pension Liability and Related Ratios

June 30, 2018

(In thousands)

	2018	2017	2016	2015
TOTAL PENSION LIABILITY				
Service cost	$ 16,419	$ 15,920	$ 14,875	$ 13,056
Interest	47,341	44,962	41,160	40,956
Differences between expected and actual experience	(1,474)	2,592	(1,395)	1,929
Change of assumptions	-	(1,479)	24,098	-
Benefit payments , including refunds of employee contributions	(30,731)	(28,604)	(26,106)	(24,357)
Net change in total pension liability	31,555	33,391	52,632	31,584
Total pension liability - beginning	651,928	618,537	565,905	534,321
Total pension liability - ending	$ 683,483	$ 651,928	$ 618,537	$ 565,905
PLAN FIDUCIARY NET POSITION				
Contributions - employer	$ 13,362	$ 13,552	$ 10,845	$ 11,146
Contributions - employee	11,242	10,660	9,948	9,628
Net Investment Income	92,226	42,565	(4,572)	32,062
Benefit payments , including refunds of employee contributions	(30,731)	(28,604)	(26,106)	(24,357)
Administrative expense	(1,149)	(1,189)	(1,189)	(1,417)
Net change in plan fiduciary net position	84,950	36,984	(11,074)	27,062
Plan fiduciary net position - beginning	563,606	526,622	537,696	510,634
Plan fiduciary net position - end	$ 648,556	$ 563,606	$ 526,622	$ 537,696
Massport net pension liability - ending	$ 34,927	$ 88,322	$ 91,915	$ 28,209
Plan fiduciary net position as a percentage of the total pension liability	94.9%	86.5%	85.1%	95.0%
Covered payroll	114,385	112,167	103,212	99,113
Massport's net pension liability as a percentage of covered payroll	30.5%	78.7%	89.1%	28.5%

MASSACHUSETTS PORT AUTHORITY
Required Supplementary Information (Unaudited)
Schedule of OPEB Contributions

	2018	2017	2016	2015	2014
Actuarially determined contribution	$ 15,177	$ 18,084	$ 14,390	$ 13,187	$ 14,738
Authority contribution	15,682	14,300	12,000	12,000	14,000
Contribution deficiency (excess)	$ (505)	$ 3,784	$ 2,390	$ 1,187	$ 738
Covered - employee payroll	$ 135,585	$ 131,477	$ 119,153	$ 117,277	$ 110,167
Contributions as a % of covered employee payroll	11.6%	10.9%	10.1%	10.2%	12.7%

	2013	2012	2011	2010	2009
Actuarially determined contribution	$ 14,006	$ 18,444	$ 17,229	$ 18,345	$ 17,263
Authority contribution	20,851	13,807	17,100	15,338	14,905
Contribution deficiency (excess)	$ (6,845)	$ 4,637	$ 129	$ 3,007	$ 2,358
Covered - employee payroll	$ 102,487	$ 98,201	$ 99,457	$ 97,980	$ 97,946
Contributions as a % of covered employee payroll	20.3%	14.1%	17.2%	15.7%	15.2%

Methods and assumptions used to determine contribution rates:

Valuation date:

Actuarially determined contribution rates are calculated as of January 1, six months prior to the beginning of the fiscal year in which contributions are reported. The January 1, 2016 valuation established the rate for the fiscal year 2017 contribution and the January 1, 2017 valuation established the fiscal year 201 contribution. The following assumptions were used for the periods included in the funding for 2018 and 2017.

Actuarial cost method: Contribution: Projected Unit Credit
Net OPEB Liability: Entry Age Normal

Amortization method: 30 year level, closed, 20 years remaining

Asset valuation method: Fair value

Inflation: 3.0%

Salary increases: 4.5%, including inflation 2013 forward
4.75%, including inflation 2009 to 2012

Investment rate of return: 7.25% annually, net of plan investment expenses for funded program 2016 forward
7.50% annually, net of plan investment expenses for funded program 2015
7.75% annually, net of plan investment expenses for funded program pre 2013
4.00% annually, net of plan investment expenses for unfunded program 2013 on
4.25% annually, net of plan investment expenses for unfunded program pre 2013

Health care trend rates Initial annual health care cost trend rate range of 1.7% to 9.0% which decreases to a long-term trend rate between 5.0% and 6.0% for all health care benefits after ten years. The initial annual dental cost trend rates range from 0.0% to 7.0% which decrease to a long term trend rate between 5.0% and 6.0% for all dental benefits after ten years.

Mortality: Healthy-RP 2000 Table (sex distinct) projected with Scale BB and Generational Mortality
Post-retirement the RP 2000 healthy annuitant Table (sex-distinct) projected with Scale BB Generational Mortality
Disabled-RP 2000 healthy annuitant Table (sex-distinct) and Generational Mortality set-forward 2 years. Mortality for accidental disability is assumed to be 50% from the same cause as the disability.

Notes to Schedule

Benefit changes - none

Changes in assumptions - Mortality table changes from Scale AA to BB in FY 2017

Other information

As of January 1, 2016, employees hired after September 30, 2009 and not eligible for post-retirement medical insurance until age 60, retirement age begins at age 60 with 10 years of service

As of January 1, 2013, the mortality assumption was changed to the RP2000 Generational Table and the retirement, disability and withdrawal assumptions were changed based on an experience study

As of January 1, 2012, the mortality assumption was changed to the RP2000 Table projected forward 22 years with Scale AA.

As of January 1, 2011, the mortality assumption was changed to the RP2000 Table projected forward 11 years with Scale AA.

As of January 1, 2010, the mortality assumption was changed to the RP2000 Table projected forward 10 years with Scale AA.

As of January 1, 2009, the mortality assumption was changed to the RP2000 Table projected forward 9 years with Scale AA.

MASSACHUSETTS PORT AUTHORITY
Required Supplementary Information (Unaudited)
Schedule of Changes in the Net OPEB Liability and Related Ratios
June 30, 2018
(in thousands)

		2018		2017
Total OPEB liability:				
Service cost	$	6,405	$	5,891
Interest		22,693		20,285
Differences between expected and actual experience		—		18,841
Change of assumptions		—		—
Benefits payments		(12,643)		(11,987)
Net change in total OPEB liability		16,455		33,030
Total OPEB liability – beginning		312,819		279,789
Total OPEB liability – ending (a)	$	329,274	$	312,819
Trust fiduciary net position:				
Contributions – employer		15,787		13,340
Contributions – employees		248		209
Net investment income		19,829		2,348
Benefits payments		(12,643)		(11,987)
Administrative expenses		(173)		(172)
Net change in fiduciary net position		23,048		3,738
Trust fiduciary net position – beginning		162,368		158,630
Trust fiduciary net position – ending (b)	$	185,416	$	162,368
Authority's net OPEB liability – end of year (a-b)	$	143,858	$	150,451
Trust fiduciary net position as a percentage of the total OPEB liability		56.3%		51.9%
Covered - employee payroll	$	131,477	$	119,153
Net OPEB liability as a percentage of covered- employee payroll		91.4%		79.2%

This schedule is intended to present 10 years of data. Additional years will be presented when available.

Notes to Schedule

This schedule is presented based on a measurement date that is 1 year in arrears.

Benefit changes - none

Schedule I

MASSACHUSETTS PORT AUTHORITY

Combining Schedule of Net Position

June 30, 2018

(In thousands)

	Authority Operations	PFC Program	CFC Program	Combined Totals
Current assets:				
Cash and cash equivalents	$ 73,299	$ —	$ —	$ 73,299
Investments	170,039	—	—	170,039
Restricted cash and cash equivalents	117,633	11,626	10,026	139,285
Restricted investments	426,434	12,168	39,917	478,519
Accounts receivable				
Trade, net	51,860	12,788	3,437	68,085
Grants	9,948	—	—	9,948
Total receivables, net	61,808	12,788	3,437	78,033
Prepaid expenses and other assets	9,114	—	57	9,171
Total current assets	858,327	36,582	53,437	948,346
Noncurrent assets:				
Investments	132,105	—	—	132,105
Restricted investments	204,053	14,659	42,864	261,576
Prepaid expenses and other assets, long-term	4,767	—	1,029	5,796
Investment in joint venture	3,130	—	—	3,130
Capital assets-not being depreciated	423,347	—	35	423,382
Capital assets-being depreciated-net	2,146,162	396,159	250,624	2,792,945
Total noncurrent assets	2,913,564	410,818	294,552	3,618,934
Total assets	3,771,891	447,400	347,989	4,567,280
Deferred outflows of resources				
Deferred loss on refunding of bonds	16,243	—	—	16,243
Deferred outflows of resources related to pensions	13,869	—	—	13,869
Deferred outflows of resources related to OPEB	28,974	—	—	28,974
Total deferred outflows of resources	59,086	—	—	59,086
Current liabilities:				
Accounts payable and accrued expenses	160,331	107	50	160,488
Compensated absences	1,327	—	—	1,327
Contract retainage	6,022	—	—	6,022
Current portion of long-term debt	59,222	—	3,729	62,951
Commercial notes payable	142,000	—	—	142,000
Accrued interest payable	34,896	—	5,656	40,552
Unearned revenues	10,185	—	—	10,185
Total current liabilities	413,983	107	9,435	423,525
Noncurrent liabilities				
Accrued expenses	10,846	—	454	11,300
Compensated absences	17,566	—	—	17,566
Net pension liability	34,927	—	—	34,927
Net OPEB liability	143,858	—	—	143,858
Contract retainage	5,778	—	—	5,778
Long-term debt, net	1,582,683	—	189,682	1,772,365
Unearned revenues	20,419	—	—	20,419
Total noncurrent liabilities	1,816,077	—	190,136	2,006,213
Total liabilities	2,230,060	107	199,571	2,429,738
Deferred inflows of resources				
Deferred gain on refunding of bonds	6,074	—	—	6,074
Deferred inflows of resources related to pensions	25,390	—	—	25,390
Deferred inflows of resources related to OPEB	831	—	—	831
Total deferred inflows of resources	32,295	—	—	32,295
Net investment in capital assets	901,662	396,160	81,257	1,379,079
Restricted for other purposes				
Bond funds	212,738	—	—	212,738
Project funds	271,003	—	—	271,003
Passenger facility charges	—	51,133	—	51,133
Customer facility charges		—	67,161	67,161
Other purposes	31,233	—	—	31,233
Total restricted	514,974	51,133	67,161	633,268
Unrestricted	151,986	—	—	151,986
Total net position	$ 1,568,622	$ 447,293	$ 148,418	$ 2,164,333

See accompanying independent auditors' report.

Schedule II

MASSACHUSETTS PORT AUTHORITY

Combining Schedule of Revenues, Expenses, and Changes in Net Position

Year ended June 30, 2018

(In thousands)

	Authority Operations	PFC Program	CFC Program	Combined Totals
Operating revenues:				
Aviation rentals	$ 240,798	$ —	$ —	$ 240,798
Aviation parking	180,803	—	—	180,803
Aviation shuttle bus	20,303	—	—	20,303
Aviation fees	153,236	—	—	153,236
Aviation concessions	114,492	—	—	114,492
Aviation operating grants and other	1,911	—	—	1,911
Maritime fees, rentals and other	94,351	—	—	94,351
Real estate fees, rents and other	30,497	—	—	30,497
Total operating revenues	836,391	—	—	836,391
Operating expenses:				
Aviation operations and maintenance	296,186	—	—	296,186
Maritime operations and maintenance	63,976	—	—	63,976
Real estate operations and maintenance	14,852	—	—	14,852
General and administrative	62,470	—	—	62,470
Payments in lieu of taxes	20,408	—	—	20,408
Pension and other post-employment benefits	28,952	—	—	28,952
Other	8,449	—	—	8,449
Total operating expenses before depreciation and amortization	495,293	—	—	495,293
Depreciation and amortization	203,483	44,496	14,183	262,162
Total operating expenses	698,776	44,496	14,183	757,455
Operating income (loss)	137,615	(44,496)	(14,183)	78,936
Nonoperating revenues and (expenses):				
Passenger facility charges	—	81,016	—	81,016
Customer facility charges	—	—	33,003	33,003
Investment income	16,512	764	1,301	18,577
Net (decrease)/increase in the fair value of investments	(3,769)	(120)	(484)	(4,373)
Other revenues	1,315	—	49	1,364
Settlement of claims	2,019	—	—	2,019
Terminal A debt service contribution	—	(12,232)	—	(12,232)
Other expenses	—	—	(195)	(195)
Gain on sale of equipment	182	—	—	182
Interest expense	(54,215)	(1,856)	(11,419)	(67,490)
Total nonoperating (expense) revenue, net	(37,956)	67,572	22,255	51,871
Increase in net position before capital contributions	99,659	23,076	8,072	130,807
Capital contributions	25,384	—	—	25,384
Increase in net position	125,043	23,076	8,072	156,191
Net position, beginning of year	1,443,579	424,217	140,346	2,008,142
Net position, end of year	$ 1,568,622	$ 447,293	$ 148,418	$ 2,164,333

See accompanying independent auditors' report.

MASSACHUSETTS PORT AUTHORITY

Combining Schedule of Net Position

June 30, 2017

(Restated)

(In thousands)

	Authority Operations	PFC Program	CFC Program	Combined Totals
Current assets:				
Cash and cash equivalents	$ 82,095	$ —	$ —	$ 82,095
Investments	132,021	—	—	132,021
Restricted cash and cash equivalents	113,659	60,952	16,303	190,914
Restricted investments	278,257	21,283	17,901	317,441
Accounts receivable				
Trade, net	52,706	11,749	3,175	67,630
Grants	5,811	—	—	5,811
Total receivables, net	58,517	11,749	3,175	73,441
Prepaid expenses and other assets	7,907	—	57	7,964
Total current assets	672,456	93,984	37,436	803,876
Noncurrent assets:				
Investments	152,661	—	—	152,661
Restricted investments	208,582	10,220	40,238	259,040
Prepaid expenses and other assets, long-term	4,550	—	1,087	5,637
Investment in joint venture	2,843	—	—	2,843
Capital assets-not being depreciated	380,311	12	—	380,323
Capital assets-being depreciated-net	2,123,162	374,201	264,807	2,762,170
Total noncurrent assets	2,872,109	384,433	306,132	3,562,674
Total assets	3,544,565	478,417	343,568	4,366,550
Deferred outflows of resources				
Deferred loss on refunding of bonds	17,983	—	—	17,983
Deferred outflows of resources related to pensions	37,298	—	—	37,298
Deferred outflows of resources related to OPEB	37,729	—	—	37,729
Total deferred outflows of resources	93,010	—	—	93,010
Current liabilities:				
Accounts payable and accrued expenses	133,941	—	8	133,949
Compensated absences	1,400	—	—	1,400
Contract retainage	8,729	—	—	8,729
Current portion of long-term debt	66,521	52,910	3,569	123,000
Commercial notes payable	109,000	—	—	109,000
Accrued interest payable	31,994	1,290	5,731	39,015
Unearned revenues	15,939	—	—	15,939
Total current liabilities	367,524	54,200	9,308	431,032
Noncurrent liabilities				
Accrued expenses	14,118	—	503	14,621
Compensated absences	17,908	—	—	17,908
Net pension liability	88,322	—	—	88,322
Net OPEB liability	150,451	—	—	150,451
Contract retainage	1,236	—	—	1,236
Long-term debt, net	1,534,254	—	193,411	1,727,665
Unearned revenues	13,374	—	—	13,374
Total noncurrent liabilities	1,819,663	—	193,914	2,013,577
Total liabilities	2,187,187	54,200	203,222	2,444,609
Deferred inflows of resources				
Deferred gain on refunding of bonds	6,809	—	—	6,809
Deferred inflows of resources related to OPEB	—	—	—	—
Total deferred inflows of resources	6,809	—	—	6,809
Net investment in capital assets	877,239	321,303	91,796	1,290,338
Restricted for other purposes				
Bond funds	209,333	—	—	209,333
Project funds	196,738	—	—	196,738
Passenger facility charges	—	102,914	—	102,914
Customer facility charges		—	48,550	48,550
Other purposes	28,101	—	—	28,101
Total restricted	434,172	102,914	48,550	585,636
Unrestricted	132,168	—	—	132,168
Total net position	$ 1,443,579	$ 424,217	$ 140,346	$ 2,008,142

See accompanying independent auditors' report.

Schedule IV

MASSACHUSETTS PORT AUTHORITY

Combining Schedule of Revenues, Expenses, and Changes in Net Position

Year ended June 30, 2017

(Restated)

(In thousands)

	Authority Operations	PFC Program	CFC Program	Combined Totals
Operating revenues:				
Aviation rentals	$ 217,906	$ —	$ —	$ 217,906
Aviation parking	169,354	—	—	169,354
Aviation shuttle bus	19,278	—	—	19,278
Aviation fees	145,418	—	—	145,418
Aviation concessions	98,913	—	—	98,913
Aviation operating grants and other	2,909	—	—	2,909
Maritime fees, rentals and other	82,088	—	—	82,088
Real estate fees, rents and other	25,037	—	—	25,037
Total operating revenues	760,903	—	—	760,903
Operating expenses:				
Aviation operations and maintenance	274,506	—	—	274,506
Maritime operations and maintenance	59,629	—	—	59,629
Real estate operations and maintenance	13,215	—	—	13,215
General and administrative	59,342	—	—	59,342
Payments in lieu of taxes	19,276	—	—	19,276
Pension and other post-employment benefits	38,903	—	—	38,903
Other	9,631	—	—	9,631
Total operating expenses before depreciation and amortization	474,502	—	—	474,502
Depreciation and amortization	194,895	43,768	14,183	252,846
Total operating expenses	669,397	43,768	14,183	727,348
Operating income (loss)	91,506	(43,768)	(14,183)	33,555
Nonoperating revenues and (expenses):				
Passenger facility charges	—	76,296	—	76,296
Customer facility charges	—	—	33,055	33,055
Investment income	11,093	1,226	774	13,093
Net (decrease)/increase in the fair value of investments	(4,005)	(92)	(404)	(4,501)
Other revenues	3,969	—	93	4,062
Settlement of claims	248	—	—	248
Terminal A debt service contribution	—	(11,941)	—	(11,941)
Other expenses	—	—	(198)	(198)
Gain on sale of equipment	125	—	—	125
Interest expense	(51,470)	(4,118)	(11,569)	(67,157)
Total nonoperating (expense) revenue, net	(40,040)	61,371	21,751	43,082
Increase in net position before capital contributions	51,466	17,603	7,568	76,637
Capital contributions	12,635	—	—	12,635
Increase in net position	64,101	17,603	7,568	89,272
Net position, beginning of year	1,379,478	406,614	132,778	1,918,870
Net position, end of year	$ 1,443,579	$ 424,217	$ 140,346	$ 2,008,142

See accompanying independent auditors' report.

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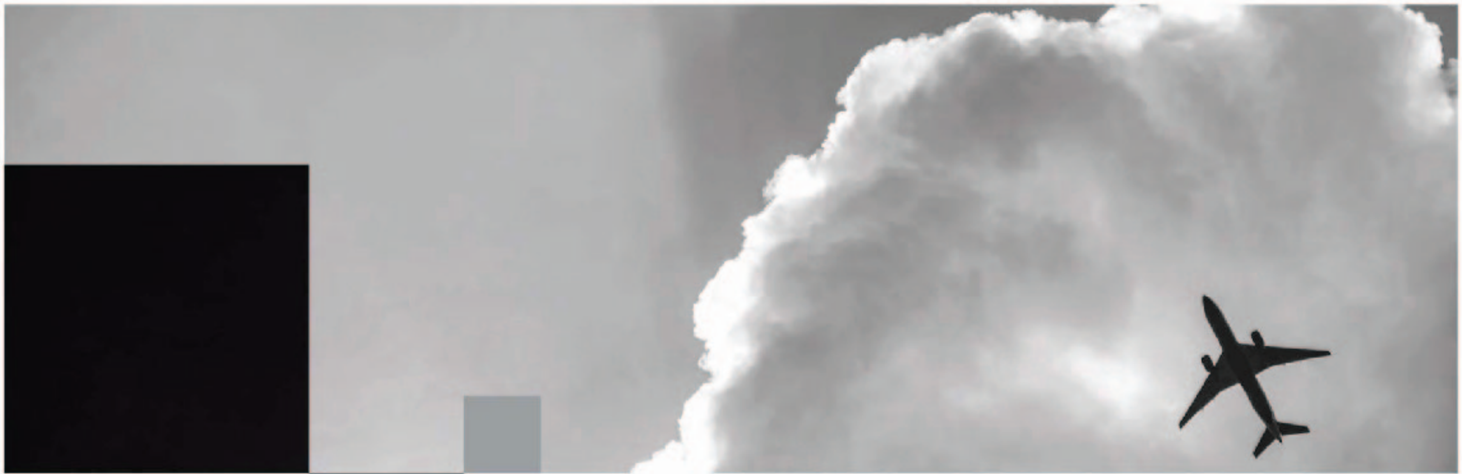
APPENDIX C



Report

Boston Logan International Airport Market Analysis

June 20, 2019

Submitted to:
Massachusetts Port Authority

Submitted by:

ICF
100 Cambridgepark Drive, Suite 501
Cambridge, MA 02140

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June 20, 2019

Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston, MA 02128-2909

Re: Boston Logan International Airport
Market Analysis

Dear Members of the Authority:

This study includes an analysis of the underlying economic basis for air travel demand at Logan International Airport ("Logan Airport" or the "Airport") and a review of current and long-term traffic and air service trends at the Airport. In this report, ICF also presents an overview of the current state of the U.S. aviation industry and the potential impact of disruption in service in the case of further airline mergers or airline liquidations. Finally, this report provides a review and opinion of the Massachusetts Port Authority's aviation activity projections for Logan Airport.

The analysis used in this report is consistent with industry practices for similar studies in connection with airport bond issuances. ICF has relied on various published economic and aviation statistics, forecasts and information, in addition to statistics provided directly by the Massachusetts Port Authority. ICF believes that these sources are reliable; however, ICF's opinion could vary materially should some of these sources prove to be inaccurate.

ICF's opinions are based upon historical trends and expectations that it believes are reasonable. Some of the underlying assumptions, which are detailed explicitly or implicitly in this report, may or may not materialize because of unanticipated events or circumstances. ICF's opinions could vary materially should any key assumption prove to be inaccurate.

Sincerely,

ICF

ICF

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TABLE OF CONTENTS

TABLE OF ACRONYMS/GLOSSARY

Term	Definition
Ancillary Revenue	Non-fare related revenue including fees for baggage, reservations and cancellations, early boarding, premium seating, onboard retail, and hotel and car rental commissions.
Boston Service Area	Greater Boston area that includes the following seven (7) counties: Bristol, Essex, Middlesex, Norfolk, Plymouth, Suffolk, and Worcester counties.
Common-Use Gate	A common-use gate at Boston Logan is a gate which is scheduled and controlled by Massport.
Domestic to International Transfer	An air passenger who connects through an airport, flying the previous leg from a domestic airport.
International to International Transfer	An air passenger who connects through an airport, flying the previous leg from an international airport.
Large Hub	Airports that enplane at least 1.0 percent of total annual U.S. passenger enplanements (defined by the FAA).
Medium Hub	Airports that enplane at least 0.25 percent but less than one percent of total annual passenger enplanements in the U.S. (FAA).
Small Hub	Airports that enplane at least 0.05 percent but less than 0.25 percent of total annual passenger enplanements in the U.S. (FAA).
Non Hub	Airports that enplane more than 10,000 passengers but less than 0.05 percent of total annual passenger enplanements in the U.S. (FAA).
Large Jet	Jet aircraft over 90 seats (FAA).
Low Cost Carrier (LCC)	The opposite of a full service carrier, an LCC typically offers fewer amenities and lower fares; often minimizes the number of aircraft types operated in order to lower costs. In the U.S., there are currently six LCCs in operation: Allegiant Air, Frontier Airlines, JetBlue, Southwest Airlines, Spirit Airlines, and Sun Country Airlines.
Major Carrier	Major airlines are defined by the U.S. DOT as those exceeding $1 billion per year in revenue and include Allegiant Air, American, Alaska Airlines, Delta Air Lines, Frontier Airlines, Hawaiian Airlines, JetBlue, Southwest Airlines, Spirit Airlines, and United Airlines.
Network/Full Service Carrier (FSC)	A carrier that operates a hub-and-spoke route structure with more amenities included than low cost carriers; typically offers multiple classes of service (e.g., economy, business, first). Also known as a “legacy carrier”. In the U.S., American, Delta, United, Alaska, and Hawaiian are considered full service carriers.
Origin & Destination (O&D)	A measure from the point of origination of a passenger to the final destination. It is the true trip of the passenger, although the passenger may change flights and planes at least once during the journey. It allows carriers to determine where their true business lies.
Regional Carrier	Carriers operating smaller piston, turboprop, and regional jet aircraft (up to 90 seats) to provide connecting passengers to the larger carriers (FAA).
Ultra-Low Cost Carrier (ULCC)	A type of low cost carrier operating a business model with extreme unbundling of services. The purchase of a ticket on an ULCC typically covers only the seat and does not include seat choice, food or drink, checked or carry-on luggage, or a paper boarding pass - all amenities available for additional a la carte purchase. In this report, four ULCCs are discussed: Allegiant Air, Frontier Airlines, Spirit Airlines, and Sun Country. All of the previously mentioned ULCCs, except for Sun Country, are also considered major carriers. Sun Country is categorized as a national carrier by U.S. DOT.
Upgauging	The substitution of larger seat capacity aircraft for smaller capacity aircraft on a specific route.
Yield	Passenger ticket revenue per seat mile, excluding fees paid for ancillary products and services.

Acronym	Definition	Acronym	Definition
ASM	Available Seat Miles	**LCC**	Low Cost Carrier
CAGR	Compound Annual Growth Rate	**O&D**	Origin & Destination
CASM	Cost per Available Seat Mile	**RASM**	Revenue per Available Seat Mile
CY	Calendar Year	**RJ**	Regional Jet
FAA	Federal Aviation Administration	**RPM**	Revenue Passenger Miles
FSC	Full Service Carrier	**TAF**	Terminal Area Forecast
GA	General Aviation	**ULCC**	Ultra Low Cost Carrier

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1. INTRODUCTION AND KEY FINDINGS

1.1 Introduction

The Massachusetts Port Authority ("Massport" or the "Authority") retained ICF to perform a market analysis of the Boston Logan International Airport ("Logan" or "Logan Airport" or the "Airport") in connection with the issuance by Massport of its Revenue Bonds, Series 2019-B (Non-AMT) and Series 2019-C (AMT) (the "2019 Bonds").

This study includes an analysis of regional underlying socioeconomic drivers that generate demand for air travel at Logan Airport. As part of our work, ICF reviewed current air service trends at the Airport as well as long term regional economic trends that will impact future passenger growth at the Airport. This study also presents an overview of the current state of the U.S. aviation industry and the potential implications for Logan. Finally, ICF presents its review and opinion of Massport's aviation projections for Logan Airport.

ICF relied on information from a variety of published sources as the basis of this study, including data from the U.S. Department of Transportation ("DOT"), the Federal Aviation Administration ("FAA"), the Official Airline Guide ("OAG"), Innovata Airline Schedules ("Innovata"), and industry information and surveys, as well as financial records, airport planning documents and aviation activity records provided by Massport. Advance OAG and Innovata schedules for July 2019 are used throughout this report. Historical trends for Logan, other large hub U.S. airports, and the U.S. are generally reported through calendar year ("CY") 2018. All years throughout this report are on a calendar year basis unless otherwise stated. Some analyses rely on the latest available data from the U.S. DOT Origin-Destination ("O&D") Passenger Survey (available through CY 2018), the U.S. DOT T-100 Database for U.S. flag airlines (available through CY 2018), the U.S. DOT Form 41 database (CY 2018), and IATA PaxIS O&D data (CY 2018). For sources where fourth quarter 2018 data was not available, the data are reported for the four quarters ended 3Q 2018 ("YE 3Q 2018" or "YE 3Q18"). Airport activity data that includes foreign flag airlines is reported for the 12-months ended November 2018, as November 2018 was the most recent data available for foreign flag carriers in the U.S. DOT T-100 database when this report was prepared.

As part of this study, ICF did not evaluate, and does not offer an opinion on, the feasibility of the engineering, design plans, or costs of any of the projects expected to be financed with proceeds of the 2019 Bonds. ICF did not engage in a legal review of lease agreements or engineering contracts.

ICF's opinions are based upon historical trends and expectations that it believes are reasonable. Some of the underlying assumptions, which are detailed explicitly or implicitly elsewhere in this report, may or may not materialize because of unanticipated events or circumstances. ICF's opinions could vary materially should any key assumption prove to be inaccurate. The opinions expressed herein are not given as an inducement or endorsement for any financial transaction. This report reflects ICF's expert opinion and best judgment based on the information available to it at the time of its preparation. ICF does not have, and does not anticipate having any financial interest in this transaction.

1.2 Key Findings

Logan Airport Strengths

- The 16th busiest U.S. airport in North America, with 40.9 million passengers in CY 2018 (representing a 6.6 percent increase over CY 2017).[1]
- Sustained long-term average passenger growth at an average annual rate of 4.6 percent since CY 2008 (compared to a national average of 1.8 percent during the same period).
- One of the top U.S. origin-destination ("O&D") markets (Logan Airport has the third highest domestic O&D traffic share[2] among U.S. large hub airports) and fastest growing markets (Logan Airport has been the 5th fastest growing among U.S. large hub airports since 2013).
- A highly competitive market served by a diversified group of airlines and a key focus city for JetBlue and Delta Air Lines.
- A high percentage of Low Cost Carrier ("LCC") service, offering passengers a choice of carriers on many major routes.
- A proven ability to manage gate utilization through a preferential gate use policy, the use of short-term leases, and effective recapture and sublet provisions in its leases.

2018 Logan Airport Ranking

16th *Busiest Commercial Airport in the U.S. by Number of Passengers*

5th *Fastest Growing Large Hub U.S. Airport*

5th *Largest Transatlantic Gateway by International Passenger Volume*

3rd *Highest Domestic O&D Share*

4th *Least Airline Concentration*

Boston Market Fundamentals

- The 10th most populated Metropolitan area in the nation.[3]
- Growing employment base with one of the lowest unemployment rates in the country.
- A high-income population area, with an average per capita income that was 35 percent higher than the national average.[4] This per capita wealth advantage is expected to continue at least through 2032.[5]
- A well-diversified, travel intensive regional economic base with core industries including high technology, biotechnology and pharmaceuticals, health care, financial services, higher education, and tourism.

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[1] Massport.
[2] Tied with Orlando International Airport.
[3] U.S. Census Bureau, *Annual Estimates of the Resident Population of Metropolitan and Micropolitan Statistical Areas: April, 2010 to July 1, 2018*, (for the Boston-Cambridge-Newton, MA-NH Metropolitan Statistical Area).
[4] Woods & Poole Economics, 2018. For the "Boston Service Area" as defined in the Glossary on page C-7. Latest actual data is 2016, where 2017 figures are estimates.
[5] Ibid.

Aviation Activity and Service Trends

- Improving operational efficiency as airlines use larger average aircraft with higher load factors. Over the past decade, the overall average passengers per operation climbed by more than 40 percent (from 74 to 104 passengers per operation).
- The 5th largest U.S. gateway for transatlantic traffic[6] as of YE November 2018.
- Significant expansion of international service in recent years with the arrival of new foreign-based carriers. New long-range, fuel-efficient widebody aircraft (such as the Boeing B787 and Airbus A350) have benefited Logan's international service, given that Boston is the type of medium sized international market that these aircraft were designed to serve.
- Anticipated growth in new international destinations with the pending introduction of Airbus A321LR service at the Airport. JetBlue has announced new transatlantic service from Boston starting in 2021. Other airlines may follow suit and introduce service from second tier European cities to Boston.

By most key market indicators, Logan Airport has been one of the strongest performing airports in the U.S. over the past five years. The Airport's performance reflects the underlying strengths of the Boston market with a large O&D passenger base, above average income levels, a travel intensive economic base, and attractiveness as a destination. As presented in this report, key economic, socio-demographic, and aviation factors suggest that passenger growth will continue over the medium to long term. As a result of the Airport's highly constrained footprint, the Authority will need to optimize terminal usage, carefully manage gates, and undertake a capital program to support facility upgrades and terminal improvements, in order to accommodate the expansion of passenger throughput currently being experienced at the Airport.

Massport Activity Forecasts for Logan Airport

- Massport's planning forecast, used for planning of facilities and operations, projects passenger traffic at Logan Airport to increase by 2.4 percent per year between CY 2019 and CY 2023. Over the longer term, passenger traffic is forecasted to reach over 47.1 million passengers in CY 2023.
- Massport's financial forecast, used for financial planning purposes and generally more conservative than the planning forecast, projects passenger traffic at Logan Airport to increase at an average annual rate of 1.4 percent over the next five years reaching 44.1 million passengers in FY 2023.
- ICF's view is that these forecasts for Logan Airport represent reasonable and conservative projections of future activity at the Airport, given the maturity of the Boston market, the historical volatility of the airline industry, and the past historical performance of the Airport.

1.3 Report Layout

This market study report presents the key elements that drive aviation growth at Logan Airport. This chapter highlights the key findings of our report. Chapter 2 provides an overview of the U.S. aviation industry including recent trends; Chapter 3 discusses the demographic and economic environment in which Logan Airport operates; Chapter 4 provides a detailed description of airlines serving the Airport, their current service levels, passenger trends, as well as operations and cargo growth; and Chapter 5 presents and reviews Massport's planning and financial traffic forecasts.

[6] Transatlantic includes destinations from the U.S. to Africa, Europe, and the Middle East.

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2. INDUSTRY OVERVIEW

2.1 Introduction

The U.S. airline industry is currently witnessing an unprecedented period of operating profitability, with the major U.S. airlines[7] earning a combined operating profit of $17.1 billion in CY 2018. Passenger demand has also continued to strengthen, with U.S. industry enplanements exceeding pre-recession levels for the fourth consecutive year in 2018. However, fuel prices have been on the rise recently, while the U.S. economy has slowed in terms of real year-over-year GDP growth. As a result, airline operating profits seem to be moderating from the peak of $27.6 billion in CY 2015.[8]

The U.S. market composition has been evolving as LCCs expand at a faster rate than full service carriers ("FSCs"). The new services provided by domestic ULCCs (e.g., Allegiant, Frontier, Spirit Airlines) have helped stimulate U.S. domestic O&D growth in small/medium markets. Similarly, the emergence of long-haul, low-cost foreign carriers (e.g., Norwegian, LEVEL, French Bee) has stimulated international travel and competition.

Following the 2008-2009 recession, U.S. carriers maintained tight capacity discipline for a number of years, emphasizing cautious available seat increases and the use of appropriately-sized aircraft to serve markets. In the past five years, steady economic growth, competitive airfares, and airline partnerships have accelerated traffic growth allowing U.S. carriers to add seat capacity at a faster rate than in previous years. Overall U.S. airline seat capacity grew year-over-year by 5.0 percent in July 2019 compared to 5.3 percent in July 2018.[9] Domestic capacity grew by 5.1 percent year-over-year in July 2019, while international capacity grew by 4.1 percent. New technology in the form of larger, long range, and fuel-efficient widebody aircraft such as the Boeing B787 and Airbus A350 has contributed to the growth of increased nonstop international services to and from the U.S. to a range of international markets.

The outlook for U.S. airline performance in the near-term is anticipated to be strong. The International Air Transport Association ("IATA") forecasts that North American carriers (including airlines of all sizes) will earn a net profit of approximately $16.6 billion in 2019, up 12.9 percent from the $14.7 billion net profit in 2018.[10] However, fuel price volatility remains a significant challenge. West Texas Intermediate ("WTI") crude oil prices as of May 2019 have been increasing since December 2018 by an average of 4.2 percent monthly from a price of $49.52 per barrel.[11] WTI crude oil prices have risen more than 110 percent compared to its low reported spot price in February 2016 of $30.32 per barrel.[12] While increased fuel costs could affect future airline operating profits and fleet renewals, passenger demand and airline capacity growth are expected to remain strong through the next five years. U.S. airports, especially large hub airports like Logan,[13] are expected to continue to see expanded airline services by both FSCs and LCCs.

2.2 History of the U.S. Aviation Industry

2.2.1 Historical System Shocks and Recoveries

The airline industry is cyclical and highly sensitive to economic and political events. Exhibit 2-1 shows the declines and recoveries in historical U.S. airline traffic since 1970. Industry traffic has declined during all of the economic recessions of the past decades. Other "shocks" such as the PATCO[14] air traffic controllers strike in the early 1980s, the Gulf War in 1990/91, various airline liquidations and reorganizations in the early 1990s and 2000s, the events of 9/11, the great recession (of 2008-2009), and volatile oil prices have also challenged and changed the airline environment significantly, causing passenger travel declines and gradual recovery cycles.

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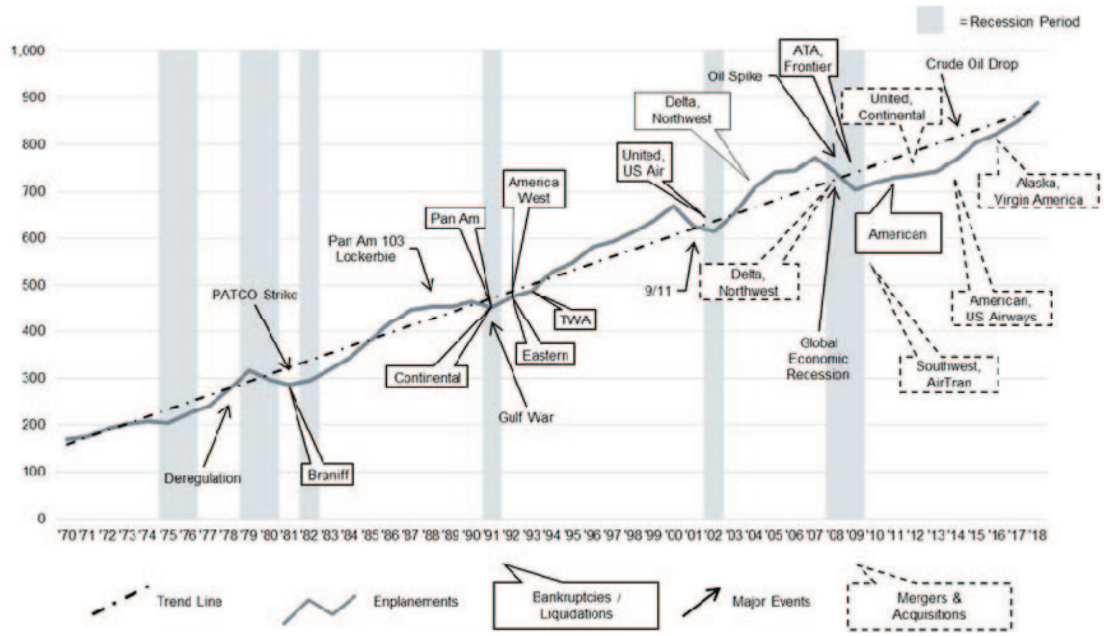
[7] Major airlines are defined by the U.S. DOT as those exceeding $1 billion per year in revenue and include Allegiant, American, Alaska, Delta, Frontier, Hawaiian, JetBlue, Southwest, Spirit, and United. Following their merger in December 2013, American Airlines and US Airways are now combined and will be referred to as American Airlines throughout this report. The merger between Alaska Airlines and Virgin America was finalized in late 2016, however operations were not completely consolidated until April 2018. Any operational statistics from the two airlines after April 2018 will be referred to as Alaska Airlines throughout this report.
[8] U.S. DOT Form 41.
[9] Innovata Airline Schedules.
[10] IATA, "Cautious Optimism Extends into 2019 - Airlines Heading for a Decade in the Black" press release (December 12, 2018).
[11] U.S. Energy Information Administration monthly spot prices.
[12] Bloomberg: WTI Crude Oil (Nymex) price reported at $63.61 USD per barrel in mid-May 2019.
[13] The FAA defines large hubs as airports that enplane at least one percent of total U.S. air passengers. There are currently 29 large hub U.S. airports, excluding Honolulu.
[14] Professional Air Traffic Controllers Organization.

In all cases, the industry recovered over time and growth in air passenger traffic resumed. In some cases, significant capacity reductions followed shocks – e.g., after 9/11, bankruptcy reorganizations caused many carriers to reduce their fleets and networks, and U.S. airlines reduced capacity by approximately 13 percent. However, in each case there has been a gradual rebuilding of capacity as traffic growth resumed. As seen in Exhibit 2-1, total passenger enplanements in CY 2018 exceeded the long-term trend line for the first time since 2008. From CY 1970 to CY 2018, total U.S. domestic and international passenger enplanements grew at an average annual rate of 3.5 percent.

Exhibit 2-1: Airline Industry Shocks and Recoveries, U.S. Total Enplanements (In Millions, 1970 to 2018)



Source: Airlines for America (A4A)

Similar to past industry recoveries seen after other historical shocks, passenger traffic has been recovering in recent years following the sharp decline associated with the global economic recession in 2008-2009. Traffic fell in 2008 and 2009 as economic recession linked to the U.S. subprime mortgage crisis depressed passenger demand. Traffic also declined in response to drastic capacity cuts and fare increases introduced by airlines due to a spike in fuel prices in 2008. Passenger traffic recovery began in 2010 as economic conditions slowly improved. Traffic growth strengthened over the past three years and industry enplanements exceeded pre-recession levels for the fourth consecutive year in 2018.

2.2.2 Airline Consolidation and Partnerships

The events of 9/11 and the difficult operating conditions caused by high fuel prices and global recession led to a number of airline bankruptcies and mergers over the past 15 years. FSCs filed for Chapter 11 protection to reorganize and lower operating costs. Delta, Northwest, United, US Airways, and American all entered Chapter 11 between 2001 and 2011, while many smaller carriers, including American Trans Air (ATA), Skybus Airlines, and Aloha Airlines, ceased operations. Overall, U.S. airlines have emerged from restructuring more streamlined, poised to ride out the cyclical operating environment with lower costs and stricter capacity discipline.

U.S. airline industry consolidation has included many high-profile mergers and acquisitions. Three mergers among FSCs each produced the world's largest carrier in terms of passengers. Delta and Northwest, both of which emerged from bankruptcy in 2007, combined (under the name "Delta") in October 2008; United and

Continental merged (under the name "United") in November 2010; and American Airlines and US Airways merged (under the name "American Airlines") in December 2013.[15]

The trend of airline consolidation has also extended to LCCs, with mergers between Frontier Airlines and regional airline Midwest (keeping the "Frontier" brand) in April 2010.[16] By October 2013, Frontier Airlines was acquired by private equity firm Indigo Partners, which eventually led Frontier to become an ultra-low cost carrier. In April 2011, Southwest and AirTran merged under the name "Southwest", resulting in Southwest solidifying its position as the largest LCC in the U.S. With the incorporation of AirTran operations, Southwest is currently the third largest domestic carrier by seat capacity after American and Delta. In December 2016, Alaska Airlines completed its acquisition of San Francisco-based LCC Virgin America. The merger between Alaska and Virgin America created a strong West Coast carrier and made Alaska the fifth largest domestic carrier in terms of seat capacity.

As a result of airline mergers, capacity has become more concentrated. In July 2019, the top four domestic carriers by seat capacity – American, Delta, Southwest, and United – are scheduled to account for approximately 80 percent of total domestic capacity, up from 70 percent in July 2014.

Exhibit 2-2: U.S. Airline Domestic Service Concentration – Share of Average Weekly Seat Capacity (Advance Schedules, July 2019)

Rank	Airline	Capacity Share	Rank	Airline	Capacity Share
1	American	22.2%	6	JetBlue	3.8%
2	Delta	20.9%	7	Spirit Airlines	3.8%
3	Southwest	20.8%	8	Frontier	2.5%
4	United	15.7%	9	Allegiant Air	2.2%
5	Alaska	5.7%	10	Hawaiian Airlines	1.3%
	Other	1.1%			
	Total	**100.0%**			

Source: Innovata Schedules.

Airline consolidation has also progressed through the creation of global airline alliances and joint ventures (JVs). Three major global alliances were created between 1997 and 2000 and are still in existence today: Star Alliance, SkyTeam, and oneworld. These alliances allowed airlines to combine their networks to create a broader global network, jointly market flights, share lounges, offer reciprocal frequent flyer program benefits, and align schedules to maximize connectivity and efficiency of operations. Current airline membership in the three major alliances is shown in Exhibit 2-4. In recent years, antitrust immunity has been granted to a number of JVs within the global alliances, allowing carriers to more closely coordinate operations, including pricing, and increase cost savings in international markets. Most of the world's major airlines are members of JV partnerships today, including but not limited to the following:

[15] American and US Airways began operating under the same operating certificate in April 2015.
[16] In December 2013, Republic Airways Holdings sold Frontier Airline to private equity firm Indigo Partners LLC.

Exhibit 2-3: U.S. Airline Joint Venture Partnerships

Transpacific JV	Transatlantic JV
Delta *Korean Air*	**Delta** *Alitalia, Air France, KLM*
American *Japan Airlines*	**American** *British Airways, Finnair, Iberia*
United *ANA*	**United** *Air Canada, Austrian, Brussels, Lufthansa, Swiss*

As customers come to expect seamless global travel and airlines look to expand capacity while mitigating high cost and risk, the rise of immunized JVs is a trend that is expected to continue to dominate international operations in coming years.

Exhibit 2-4: Airline Alliance Membership (as of May 2019)

oneworld	SkyTeam		Star	
American Airlines	Aeroflot	Middle East Airlines	Adria Airways	EVA Air
British Airways	Aerolineas Argentinas	Saudia	Aegean Airlines	LOT Polish Airlines
Cathay Pacific	Aeromexico	Tarom	Air Canada	Lufthansa
Finnair	Air Europa	Vietnam Airlines	Air China	Scandinavian Airlines
Iberia	Air France	Xiamen Airlines	Air India	Shenzhen Airlines
Japan Airlines	Alitalia		Air New Zealand	Singapore Airlines
LATAM	China Airlines		ANA	South African Airways
Malaysia Airlines	China Eastern		Asiana Airlines	SWISS
Qantas Airways	Czech Airlines		Austrian	TAP Portugal
Qatar Airways	Delta Air Lines		Avianca	Thai Airways
Royal Jordanian	Garuda Indonesia		Brussels Airlines	Turkish Airlines
S7 Airlines	Kenya Airways		Copa Airlines	United Airlines
Sri Lankan Airlines	KLM		Croatia Airlines	
Royal Air Maroc*	Korean Air		Egyptair	
			Ethiopian Airlines	

* Royal Air Maroc (RAM) is currently a "member elect", and will be implemented by mid-2020; RAM Express (regional subsidiary airline) will also join oneworld as an affiliate member at the same time.
Source: Alliance websites.

Unlike many airports that predominantly cater to flights by one specific carrier or alliance, Boston Logan's service is less concentrated, encompassing members of all three major alliances, as well as unaligned LCCs. This means that the Airport is less susceptible to detrimental changes in service levels due to potential future U.S. airline consolidation or changes in carrier network strategy. The largest carrier at Logan Airport, JetBlue, is not a member of any of the three alliances, but has shown willingness to enter into interline and codeshare partnerships with at least ten foreign carriers serving the Airport. As shown in section 4.3 (Exhibit 4-7), 48 percent of weekly departing seats at Logan are unaligned. This has been an important factor in Logan Airport's ability to attract new foreign carrier service in recent years.

2.3 Airline Capacity and Passenger Traffic Trends

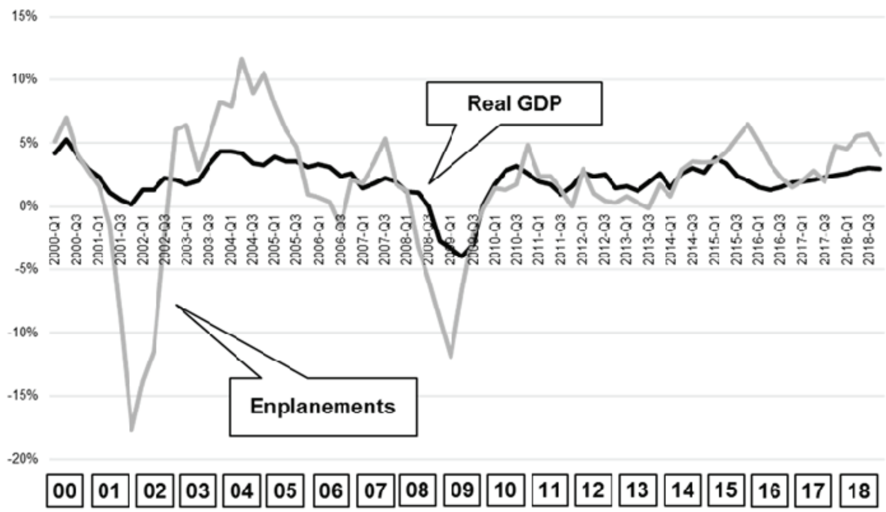
2.3.1 Passenger Demand Trends

Air travel demand has historically demonstrated a strong correlation to the economy. Airline passenger traffic normally declines during an economic recession with passenger growth resuming during subsequent economic expansions. This correlation can be seen clearly over the past decade as passenger demand fell during the global economic recession and recovered as the economy improved (Exhibit 2-5).

The year 2008 marked the beginning of a nationwide economic downturn following the global credit-related financial crisis. U.S. GDP decreased year-over-year for the first time in well over a decade. Fuel costs reached an unprecedented high in 2008, forcing carriers to cut capacity and raise fares. This allowed carriers to pass on fuel surcharges to consumers in efforts to offset increases in operating costs. However, passenger traffic declined sharply as a reaction to rising fares and service cuts.

Passenger traffic recovery began in late 2009 as the GDP decline started to moderate. Enplanement growth was slow through mid-2014, corresponding to the slow pace of the economic recovery in the U.S. Airline service cuts and higher airfares also constrained passenger traffic growth. Year-over-year enplanement growth in the U.S. began to strengthen in 2014 through 2015 where it reached 6.5 percent year-over-year. Despite modest economic growth, domestic air travel demand in 2015 grew at its fastest pace since 2007. Factors contributing to this growth include falling fuel costs, competitive fares to high demand O&D markets, and the rapid expansion of domestic ULCCs such as Spirit and Allegiant. In 2016, enplanement growth slowed to 1.5 percent year-over-year growth in 4Q 2016, then picked back up from 2017 to mid-2018, rising to 5.7 percent year-over-year growth in 3Q 2018, nearly matching growth levels from late 2015. Similarly, the U.S. economy grew in 4Q 2018 by 3.0 percent year-over-year compared to 4Q 2017. Based on preliminary figures provided by the U.S. Department of Commerce, during 1Q 2019 (not shown) the U.S. economy grew by 3.2 percent year-over-year.

Exhibit 2-5: U.S. Scheduled Carrier Enplanements and U.S. Real GDP, Percent Change Over Prior Year (1Q 2000 to 4Q 2018)



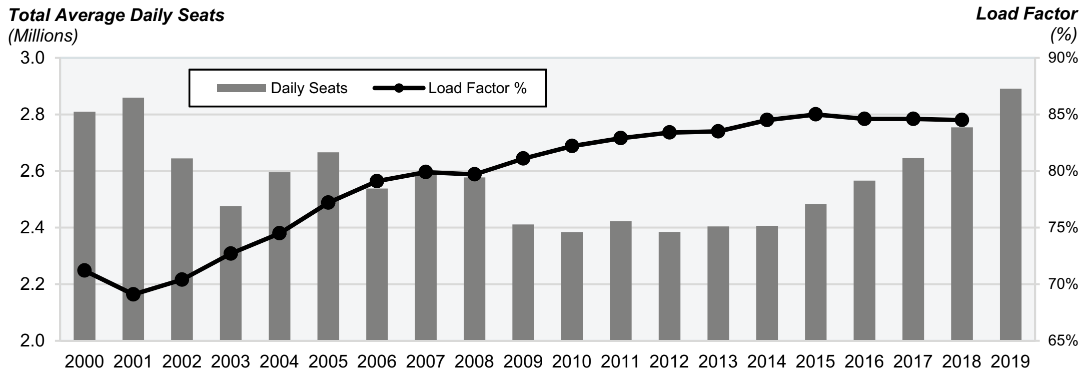
Note: Latest available quarterly domestic enplanements is 4Q 2018; Real GDP growth is based on chained 2012 US dollars.
Source: U.S. DOT Form 41 Database via Airline Data, Inc.; U.S. DOC, Bureau of Economic Analysis.

2.3.2 Capacity Trend Review

As illustrated in Exhibit 2-6, U.S. domestic capacity has been increasing steadily since 2013, reaching over 2.8 million daily seats in July 2019, surpassing the peak pre-recession levels of 2007. In 2008-2009, carriers implemented widespread service cuts in response to a spike in fuel prices and the global economic recession. As the economy gradually recovered, seat capacity remained relatively flat through 2014, reflecting industry consolidation and airlines' continued adherence to capacity discipline. Benefiting from strengthening travel demand and a decline in oil prices in 2015, carriers at that time took the opportunity to increase domestic capacity resulting in domestic seat capacity rising by approximately 3.9 percent per year through July 2019. The U.S. has seen its sixth consecutive positive annual growth in domestic scheduled seats (July comparison), having grown 5.0 percent in July 2019 compared to July 2018.

Airlines have used better revenue management techniques and prudent seat capacity control to increase passenger load factors to all-time highs. Exhibit 2-6 shows that despite growth in seat capacity since 2014, airlines have been able to maintain extremely high average load factors of nearly 85 percent. The very slight decline in load factor since 2015 is a result of seat capacity increases implemented by U.S. carriers over the last three years.

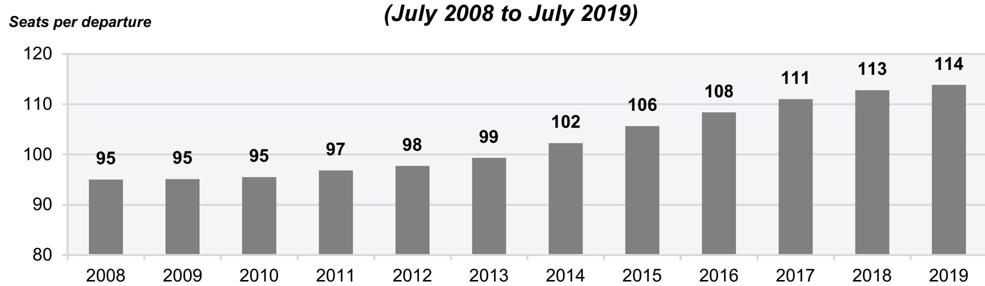
Exhibit 2-6: U.S. Domestic Scheduled Daily Seats and Year-Over-Year Change (July 2000 to July 2019)



Note: July 2019 is using advance schedules. Load factor percentages are averages for the respective calendar year. Latest available domestic load factors were for Dec. 2018.
Source: OAG Schedules, Innovata Schedules, U.S. DOT, T-100 Database via Airline Data, Inc.

Seat growth has been driven predominately by increases in the average number of seats per aircraft ("densification"). As seen in the exhibit below, average aircraft size has grown from 99 seats per departure in July 2013 to 114 in July 2019, which is an average growth of 2.3 percent annually. Aircraft densification is one of several strategies, along with improved revenue management, new fuel efficient aircraft, and optimized frequencies at airports with congested infrastructure, that U.S. airlines are using to improve financial performance.

Exhibit 2-7: Average Aircraft Size for Domestic Scheduled Departures (July 2008 to July 2019)

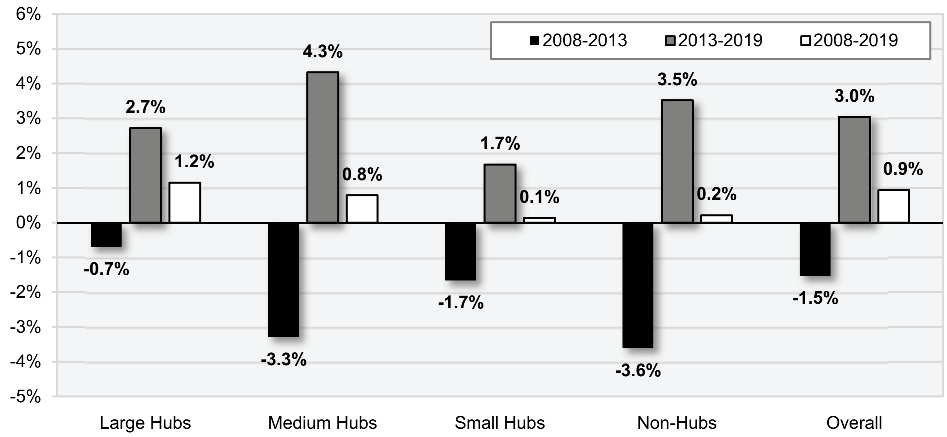


Source: Innovata Schedules.

2.3.3 Capacity Trends by Airport Type

An important trend in the U.S. domestic market is the shifting allocation of seat capacity by airport hub size. Exhibit 2-8 shows the percent change in overall airline seat capacity at U.S. airports by airport size since calendar year 2008. Between 2008 and 2013, the U.S. industry saw an overall decline in seat capacity of 1.5 percent fueled by the crude oil price spike in 2008 and the 2008-2009 recession. However, seat capacity at medium hub airports saw a decline of 3.3 percent, compared to a 1.7 percent decline at small hub airports, and a decline of 0.7 percent at large hub airports. U.S. FSCs have shifted their strategy over the past six years to concentrate growth at large and medium U.S. hub airports, while ULCCs introduced strong capacity growth and presence to previously unserved small domestic markets with nonstop service to and from medium, small, and non-hub airports. LCCs on the other hand, have been placing emphasis on international capacity expansion compared to domestic, as seen in Exhibit 2-10. Between 2013 and 2019, the overall U.S. industry saw an increase in domestic seat capacity of 3.0 percent, with medium hub airports growing the fastest at 4.3 percent and non-hubs growing the second fastest at 3.5 percent (Exhibit 2-8). Domestic capacity at large hub airports like Boston is up by 2.7 percent, while the overall domestic capacity increased 3.0 percent, over the same period.

Exhibit 2-8: Total Domestic Seat Capacity Growth by U.S. Airport Type, Percent Change (CY 2008 to CY 2019)



Note: Based on FAA 2017 Hub Classification.
Source: Innovata. CY 2019 is using advance schedules.

2.3.3.1 Full Service Carriers

As described in Section 2.2, U.S. FSCs (which currently include five major carriers: Alaska, American, Delta, Hawaiian, and United) have been forced to undergo major restructuring to survive in the operating environment since 2001. Following drastic capacity reductions in 2008-2009, FSCs have started to grow capacity again in recent years. Over the past five years, airlines have taken actions to rationalize network performance, resulting in U.S. FSCs growing system capacity on average 2.6 percent annually. Growth in more profitable markets continues to be balanced by on-going capacity cuts on unprofitable routes. Overall U.S. FSC capacity increased by 5.0 percent in July 2018 compared to the prior year, and is expected to increase by 4.8 percent in July 2019.[17] Capacity increases by top U.S. carriers in July 2019 are shown in Exhibit 2-9 below.

Exhibit 2-9: FSCs Domestic and International Seat Capacity Growth by Airline, Percent Change (July 2018 vs July 2019)

	Seat Capacity (000s) – July 2019			Percent Change			5-Year
Carrier	**Dom**	**Int'l**	**Total**	**Dom**	**Int'l**	**Total**	**CAGR**
American Airlines	19,835.8	1,966.9	21,802.7	*7.2%*	*3.1%*	*6.8%*	*1.6%*
Delta Air Lines	18,793.2	1,576.0	20,369.3	*5.1%*	*0.4%*	*4.7%*	*3.1%*
United Airlines	14,040.0	1,814.9	15,854.9	*4.0%*	*4.6%*	*4.0%*	*2.8%*
Alaska Airlines	5,093.9	128.0	5,221.8	*1.3%*	*-10.3%*	*0.9%*	*5.5%*
Hawaiian Airlines	1,172.2	69.1	1,241.3	*-1.1%*	*-2.5%*	*-1.1%*	*1.9%*
Total	**58,935.1**	**5,554.9**	**64,490.0**	***5.0%***	***2.4%***	***4.8%***	***2.6%***

Note: 5-Year CAGR aggregates merged airlines' seat capacity (e.g. US Airways-American Airlines; Virgin America-Alaska Airlines for July 2014 vs July 2019 growth analysis).
Source: Innovata Schedules.

- Since its merger with US Airways in December 2013, American Airlines has surpassed Delta to become the largest U.S. airline in terms of scheduled seat capacity. Having consolidated its operations, as of July 2019, American's capacity is scheduled to increase by 6.8 percent year-over-year, with domestic capacity expected

[17] Innovata Schedules, based on July of every year.

to rise 7.2 percent, and international capacity is expected to grow by 3.1 percent. Over the past five years since its merger, however, American has seen the slowest average annual growth in departing seat capacity, at 0.3 percent per year.

- As of July 2019, Delta is expected to grow its domestic seat capacity by 5.1 percent, international seat capacity by 0.4 percent, and system-wide capacity by 4.7 percent compared to its July 2018 capacities. Delta's international capacity growth to South Korea is expected to be particularly strong, increasing by 32.8 percent in 2018 primarily due to the joint venture agreement between Delta and Korean Air. This will offset the 5.0 percent and 13.7 percent reductions in available seats to destinations in Asia and Central/South America, respectively.[18]

- United is expected to grow system capacity by 4.0 percent in July 2019, following two years with modest growth. In July 2019, domestic seat capacity is expected to increase by 4.0 percent over the previous year, while international capacity is expected to increase by 4.6 percent. Most of the additional international capacity is coming from Canada and Europe (e.g., Italy and the Netherlands).

- Alaska Airlines experienced strong capacity growth from 2017 to 2018 of 31.6 percent system-wide, which followed the consolidation of operations with Virgin America (merger approved in December 2016). Alaska's system capacity is expected to remain stagnant, increasing slightly by 0.9 percent in July 2019, with capacity increases primarily in domestic markets. Alaska currently provides service to limited international markets such as Canada, Costa Rica, and Mexico.

- Hawaiian Airlines' system capacity is expected to decline by 1.1 percent in July 2019, after ceasing international nonstop service to China, which made up 6 percent of its international capacity in July 2018. However, Hawaiian will look to expand international capacity in 2019 to French Polynesia, South Korea, and New Zealand and has opened nonstop domestic service from Honolulu to Boston, its farthest destination east of Hawaii.

2.3.3.2 Low Cost Carriers

U.S. Low Cost Carriers (LCCs including Southwest, JetBlue, Frontier, Spirit, Sun Country, and Allegiant) rose to prominence in the early 2000s, expanding rapidly and gaining share in the domestic market. When FSCs rationalized domestic capacity and focused on more profitable international flying, LCCs seized the opportunity to increase their domestic market share. While LCCs provided just over 15.0 percent of domestic seat capacity in the U.S. in 2000, they will account for approximately 33.8 percent of domestic seats in July 2019.

In recent years, LCCs have continued to grow domestic capacity at a faster rate than FSCs, but from a smaller base. With the exception of JetBlue, all the LCCs have added domestic capacity over the past two years.

Based on forward schedules, overall LCC capacity in both domestic and international markets grew by 5.4 percent as of July 2019 over the previous year. In July 2019, international LCC capacity is expected to rise 10.7 percent from July 2018 (see Exhibit 2-10), driven mainly by JetBlue adding new international seats on its Caribbean service (e.g., Dominican Republic and Jamaica) and Spirit rapidly expanding into Central and South America (excluding Mexico).

[18] July 2017 to July 2019.

Exhibit 2-10: LCC Domestic and International Seat Capacity Growth by Airline, Percent Change (July 2018 vs July 2019)

Carrier	Seat Capacity (000s) – July 2019			Annual Percent Change			5-Year
	Dom	Int'l	Total	Dom	Int'l	Total	CAGR
Southwest	18,644.4	251.6	18,896.0	*3.3%*	*-10.9%*	*3.0%*	*3.1%*
JetBlue	3,419.2	568.8	3,988.1	*-4.6%*	*15.0%*	*-2.3%*	*4.0%*
Spirit Airlines	3,429.7	187.0	3,616.7	*15.9%*	*36.1%*	*16.8%*	*21.8%*
Frontier Airlines	2,260.6	49.3	2,309.9	*12.9%*	*22.2%*	*13.1%*	*13.7%*
Allegiant Air	1,978.8	-	1,978.8	*13.8%*	-	*13.8%*	*16.9%*
Sun Country	340.5	26.5	367.0	*41.1%*	*11.6%*	*38.5%*	*11.5%*
Total	**30,073.3**	**1,083.2**	**31,156.5**	***5.2%***	***10.7%***	***5.4%***	***6.1%***

Note: 5-Year CAGR aggregates merged airlines' seat capacity (e.g. AirTran-Southwest Airlines for July 2014 vs July 2019 growth analysis).
Source: Innovata Schedules.

A new ULCC[19] business model has emerged in recent years, embraced by Allegiant, Spirit, Frontier, and Sun Country, of which the latter three currently serve Logan. The ULCC business model is characterized by unbundling of services and often operating at underserved or remote airports. The purchase of a ticket on an ULCC covers only the seat and (depending on the carrier) does not include seat choice, food or drink, checked or carry-on luggage or a paper boarding pass - all amenities available for additional à la carte purchase. Over the past two years, U.S. based ULCCs have rapidly expanded, growing overall capacity by 16.1 percent in July 2018 and 14.9 percent in July 2019. ULCCs are rapidly adding seat capacity to their networks, however these airlines tend to be more vulnerable to economy cycles. Except for Allegiant Air, their financial performance has not been comparable to that of the LCCs or FSCs (see Exhibit 2-22), and the ULCCs are not as well capitalized as these other carriers.

LCCs and ULCCs continue to look actively at international expansion possibilities. JetBlue has already established a strong presence in the Caribbean and Latin America, adding service to over 30 Visiting Friends and Relatives ("VFR") and leisure markets. In addition, JetBlue has introduced commercial partnerships with more than 35 foreign airlines. Logan has benefited from JetBlue's expansion of international service, as well as JetBlue's collaborations with foreign airlines. Since its acquisition of AirTran, Southwest has also taken over AirTran's existing Caribbean and Mexican routes, becoming positioned for further international expansion. Spirit has also continued to build up gradually a network of Caribbean and Latin America destinations.

Capacity changes expected in July 2019 by LCCs and ULCCs are summarized below:

- Southwest, the largest LCC and third largest carrier in the U.S. in terms of seat capacity, emerged from service contractions related to its merger with AirTran and resumed capacity growth over the past two years. Southwest is expected to increase system capacity by 3.0 percent in July 2019, with significant international capacity increases planned to the Caribbean and Central America. Southwest is currently the second largest LCC at Logan Airport after JetBlue; while Southwest currently serves domestic markets only from Logan, there is potential for international service in the future.

- JetBlue is the second largest LCC in the domestic market after Southwest and the largest domestic LCC in terms of international service. JetBlue is expected to reduce its system seat capacity by 2.3 percent in July 2019 compared to the previous year, including a 4.1 percent decrease in domestic capacity largely due to a reshuffling of its aircraft, reducing short-haul routes, and adding more flights on its more profitable transcontinental routes. JetBlue has reduced capacity on its Baltimore, Detroit, Long Beach, and San Jose segments by over 30 percent, and has ceased operations from Washington Dulles[20]. However, it plans to increase total international capacity by 15.0 percent. Since launching service at Logan Airport in 2004, JetBlue has grown to become the leading carrier at Logan. JetBlue has indicated interest in continuing to build up operations at Logan on both the domestic and international front. Recently, JetBlue has announced

[19] ULCCs are a type of LCC. Allegiant, Spirit, Frontier, and Sun Country are also included in the LCC category throughout this report.
[20] According to a JetBlue spokesman, the airline has shown preference in the more centrally located Ronald Reagan Washington National Airport (DCA), NBC Washington, 2018.

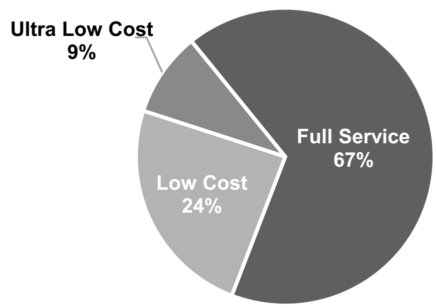
it will provide transatlantic service from its east coast hubs at New York JFK and Logan Airport to London in 2021 on their newly ordered A321LRs.

- ULCCs Sun Country, Spirit Airlines, Allegiant, and Frontier are expected to grow system capacity by 38.5 percent, 16.8 percent, 13.8 percent, and 13.1 percent, respectively, in July 2019 versus July 2018 schedules.

In recent years, European LCCs have also entered the transatlantic market, resulting in increased international air service to markets like Boston. Norwegian Air Shuttle introduced its first transatlantic service to New York JFK in May 2013 and has now expanded services to numerous other U.S. markets including Boston, Denver, Orlando, Fort Lauderdale, Las Vegas, Los Angeles, Miami, and Oakland. Norwegian's (Air Shuttle and UK) long-haul services from mainland Europe have been made possible in large part by the introduction of the Boeing B787 aircraft, which allows for improved economics flying in thinner long-haul routes. Calgary (Canada)-based low cost carrier, WestJet, began service from Boston to Halifax and Toronto (Pearson) in March/April 2016.

As of July 2019, U.S. domestic capacity seat shares were composed as shown in the chart below. Over the past decade, ULCCs have expanded their domestic networks, growing on average by 12.6 percent per year, and now account for 9.2 percent of the domestic seat market.

Exhibit 2-11: Share of Domestic Seat Capacity by Carrier Type (as of July 2019)



Carrier Type	10-Year CAGR
FSC	*+1.1 percent*
LCC	*+1.1 percent*
ULCC	*+12.6 percent*

Source: Innovata Schedules.

2.4 Fleet Expansion and Changes

2.4.1 Aircraft Orders

Aircraft orders are constantly shifting as carriers adjust their order books to reflect market activities, changes to long-range plans and available aircraft financing. The economic and financial crises in 2008-2009 led airlines to make significant cancellations and deferrals of aircraft orders. As airlines returned to profitability in recent years and sought to incorporate more fuel-efficient aircraft into their fleets, aircraft orders have returned to higher levels. Between 2019 and 2027, a total of 1,992 aircraft are scheduled to be delivered to U.S. commercial carriers. Recent aircraft orders have emphasized fuel efficiency, with the incoming aircraft slotted to replace the less efficient MD-80s, DC-9s and older 737s in carrier fleets. In addition, carriers are increasingly placing orders for larger capacity, new generation aircraft such as the Boeing B737 MAX, Airbus A220, and A321neo. After the recent accidents on foreign carriers Lion Air and Ethiopian Airlines involving the B737 MAX, the FAA and world regulators have grounded all B737 MAX aircraft. This has impacted U.S. carriers that rely on the aircraft, like Southwest, United, and American, resulting in scheduled flight cancellations through the summer (July/August) of 2019. For the purpose of this analysis, it is assumed that Boeing will resolve the problems with the B737 MAX during 2019, and that over the longer timeframe, this problem will have no material impact on the U.S. airline industry and U.S. aviation overall.

As of April 2019, aircraft orders[21] in place for delivery through 2019 are weighted 69 percent for the FSCs and 22 percent for the LCCs (see Exhibit 2-12). LCC deliveries are expected to accelerate in the 2023-2027 period, accounting for 35 percent of total on orders[22]. Other/Regional carriers are expecting high volume deliveries starting in mid-2020, due to the expected start of deliveries of the new Mitsubishi Regional Jets (MRJs).

Exhibit 2-12: New Aircraft Deliveries for U.S. Carriers
(2019 to 2027)

Carrier	Backlog					
	2019	2020	2021	2022	2023-2027	Total
Alaska	6	2	20	19	18	65
American	60	53	38	20	95	266
Delta	74	69	42	20	75	280
Hawaiian	5	1	2	2	6	16
United	73	58	33	13	115	292
Subtotal – FSC	**218**	**183**	**135**	**74**	**309**	**919**
Frontier	17	18	18	26	103	182
JetBlue	13	20	20	23	69	145
Southwest	29	43	44	27	115	258
Spirit	10	16	18	0	0	44
Subtotal – LCC	**69**	**97**	**100**	**76**	**287**	**629**
Other/Regional Carriers	30	22	72	92	228	444
Total	**317**	**302**	**307**	**242**	**824**	**1,992**
Share – FSCs	*69%*	*61%*	*44%*	*31%*	*38%*	*46%*
Share - LCCs	*22%*	*32%*	*33%*	*31%*	*35%*	*32%*
Share - Other	*9%*	*7%*	*23%*	*38%*	*28%*	*22%*

Source: Centre for Aviation ("CAPA") Fleet Database, accessed April 2019.
Note: Does not include subsidiaries; "Other/Regional Carriers" include Horizon Air, Moxy Airways, Republic Airlines, SkyWest Airlines, and Trans States Airlines. United Airlines, Delta Air Lines, and Republic Airlines have 24, 25, and 40 aircraft, respectively, on order without a delivery date, which are not reflected in the table. Allegiant did not have any aircraft on order.

Southwest has the largest number of outstanding orders among LCCs by a significant margin. Southwest has very aggressive on order deliveries, expecting to add 257 new aircraft by 2027[23], though a number of these aircraft will be for fleet replacement of their current B737-700s. Other LCCs also have large aircraft orders in place. JetBlue has orders for 145 new aircraft and Frontier has 182 aircraft on order through 2027. Spirit has 44 aircraft on order through 2027.

New FSC aircraft orders and deliveries for the period through 2027 reflect major fleet replacement programs by a number of carriers. American has large orders for the Airbus A321neo and Boeing B787s, aimed at replacing the carrier's aging and fuel-inefficient MD-83 and B757/767 fleet. United has a total of 177 aircraft deliveries scheduled for 2019-2022 and is scheduled to receive an additional 115 aircraft through 2027, for a total of 292 new aircraft by 2027, the most of any U.S. carrier. The orders include 22 Boeing B787 Dreamliners and 45 Airbus A350-900XWBs. Delta has 280 aircraft orders through 2027, 48 of which are the new Airbus A220s (previously known as Bombardier's CS100 program) aimed at replacing older Boeing B737s and Airbus A320s. In addition, Delta has orders for 100 A321neo aircraft from Airbus.

Due to the recent groundings of the B737 MAX aircraft, carriers that have received MAX aircraft are currently unable to integrate them into their existing fleet and planned schedules, and Boeing has experienced a limited

[21] Based upon CAPA Fleets, April 2019.
[22] "On order" is the status that identifies a confirmed order placed by an airline operator for the production of a specific aircraft that is expected to be delivered on a future date.
[23] As of May 2019, Southwest has 231 confirmed on orders for the B737 MAX 8 aircraft.

number of cancellations. In particular, Centre for Aviation ("CAPA") fleet data as of May 2019 indicated that U.S. carriers have cancelled a total of 16 orders[24], and 165 orders were cancelled by foreign flag carriers (e.g. Icelandair, Jet Airways[25], Monarch Airlines, etc.). Notwithstanding the foregoing, however, across the globe, Boeing still has over 440 and 600 on order deliveries for the MAX aircraft in 2019 and 2020, respectively, and nearly 1,600 between 2021 to 2025. This suggests that carriers continue to rely on and believe in the new MAX aircraft's capabilities to support their networks.

2.4.2 Next Generation Aircraft Trends

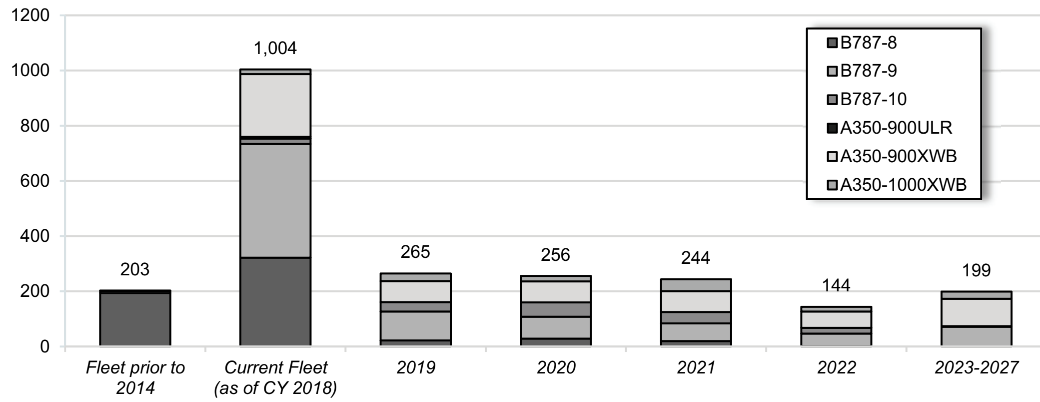
The introduction of new aircraft technology will continue to be a key enabler of new long-haul nonstop services around the world, especially with respect to international services. Aircraft such as the next-generation Boeing B777, B787 and the Airbus A330 and A350 models incorporate new airframe, engine, and wing designs, resulting in significant improvements in aircraft range and fuel efficiency. These aircraft play an important role in Boston and other medium/large size markets, allowing air carriers to create international market service opportunities by effectively filling these mid-sized widebody aircraft with local and connecting traffic. Carriers that operate the B787 and A350 on international routes from the U.S. make up 13.1 percent of international departing seat capacity as of July 2019, compared to 3.3 percent in July 2015.

Entering commercial service in 2011, the Boeing B787 "Dreamliner" was the first commercial airliner made of lightweight composite carbon fiber material rather than aluminum, allowing fuel savings of approximately 20 percent compared to existing aircraft of similar size. Despite production delays and various initial in-service problems, the B787 has enjoyed a high degree of success becoming the fastest-selling airliner to date since launch. The Airbus A350, a long-range twin-engine jetliner made primarily of composite materials, is a rival to the B787 that entered commercial service in January 2015. These new fuel-efficient aircraft are allowing carriers to serve profitably long-haul routes that were previously uneconomical with the Boeing B777, Boeing B747, Airbus A340, and other older technology long-range aircraft.

As shown in Exhibit 2-13, there are over 1,000 Boeing B787 and Airbus A350 aircraft currently in service compared to about 200 prior to 2014. More than 1,100 orders for these two aircraft have been placed by airlines worldwide[26], and in the next five years, the expected number of B787 and A350 to be in service will have nearly doubled. By the end of 2022, an additional 909 next generation aircraft are expected to be delivered including 514 B787s and 395 A350s. Asia is the leading market for next generation wide-body aircraft deliveries, with Asian carriers accounting for close to 34.9 percent of B787 and A350 aircraft orders; European carriers follow with 18.8 percent, and then Middle Eastern carriers with 14.9 percent of orders. United, American, and Delta each expect additional B787/A350 deliveries ranging from 12 to 67 aircraft through 2027.

[24] U.S. carriers that cancelled MAX aircraft orders recently include Alaska (5) and United (1).
[25] Indian flag carrier, Jet Airways, ceased operations in mid-April 2019 due to financial troubles and competition from regional Indian low cost carriers. Jet Airways alone had 100 MAX aircraft orders with Boeing lined up.
[26] As of April 2019, there are 43 Boeing 787 and 109 Airbus 350 on order without a delivery date, which are not included in the 1,100 orders.

Exhibit 2-13: Worldwide Boeing B787 and Airbus A350 Current Fleet and Projected Aircraft Deliveries



	2019	2020	2021	2022	2023-2027
B787/A350 % Of Total Widebody[27] Orders	**69.0%**	**71.1%**	**69.3%**	**57.1%**	**47.7%**
On-Option Aircraft Status	**52**	**62**	**28**	**15**	**19**
A350	47	46	24	7	5
B787	5	16	4	8	14

Note: As of April 2019, there are 43 Boeing B787 and 109 Airbus A350 on-order without a delivery date, which are not reflected in the figure above. As of April 2019, an additional 79 B787 and 121 A350 are on-option without a delivery date as reported by CAPA Fleets.
Source: CAPA Fleets, April 2019.

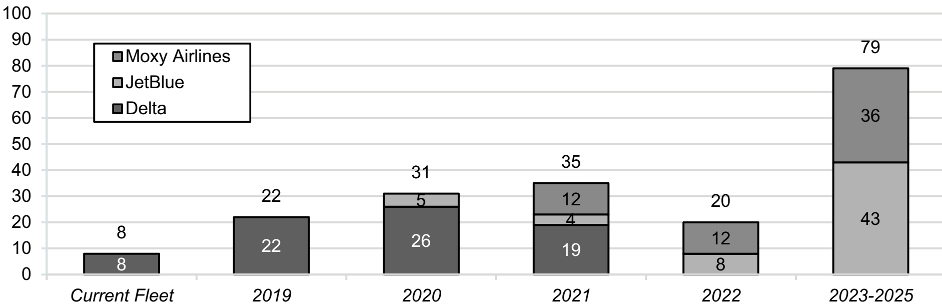
Use of new fuel-efficient aircraft will continue to allow airlines to open up new non-stop routes, introducing more service to markets that may lack significant feeder traffic from a hub carrier, such as Boston Logan Airport. As of July 2019, there were six foreign carriers scheduled to operate the B787 out of Logan providing on average 284 seats per departures. Hainan Airlines is the only carrier that operates the A350 from Logan, with 333 seats available per departure to Beijing.

In early 2019, Airbus began delivering their small narrowbody jet aircraft, the Airbus A220 (previously known as Bombardier's CSeries[28]), providing fuel efficient and comfortable aircraft that serve the 100-135 seat market. Based on CAPA fleet data, Delta, JetBlue, Moxy Airlines[29], and Republic Airlines (without delivery dates) are the only domestic carriers to have orders for the A220, and Delta has already been implementing the A220 on its shuttle flights between Boston and New York, and operations from Boston to Detroit.

As shown on Exhibit 2-14, Delta expects 48 A220 deliveries by the end of 2020, and JetBlue will receive its first five of 60 total deliveries starting April 2020. These airlines will rely on the A220s to replace their older regional jet aircraft and fly transcontinental routes given their maximum range of 3,390 miles.[30]

[27] Widebody jet aircraft on-order include B777, A330, and A380 (Airbus confirmed it will stop building the A380 in 2021 following Emirates' decision to reduce its outstanding order; Source: Business Traveler, 2019).
[28] Airbus acquired the majority of Bombardier's and Investissement Quebec's C Series program in July 2018.
[29] Moxy Airlines is a proposed airline in the U.S. founded by David Neeleman, who previously co-founded WestJet, JetBlue, and Azul Linhas Aereas. In July 2018, Moxy signed a Memorandum of Understanding with Airbus for 60 A220s, expected to be delivered starting 2021.
[30] Airbus website.

Exhibit 2-14: Airbus A220 Current Fleet and Projected Aircraft Deliveries Among U.S. Carriers



On-Option Status	N/A	N/A	N/A	N/A	60 (2025-2028)

Note: As of April 2019, there are 40 A220s on order without a delivery date for Republic Airlines and 15 for Delta. These figures are not reflected in the figure above. Year 2019 reflects the remainder of 2019 after April.
Source: CAPA Fleets, April 2019.

2.5 U.S. Airline Financial Performance

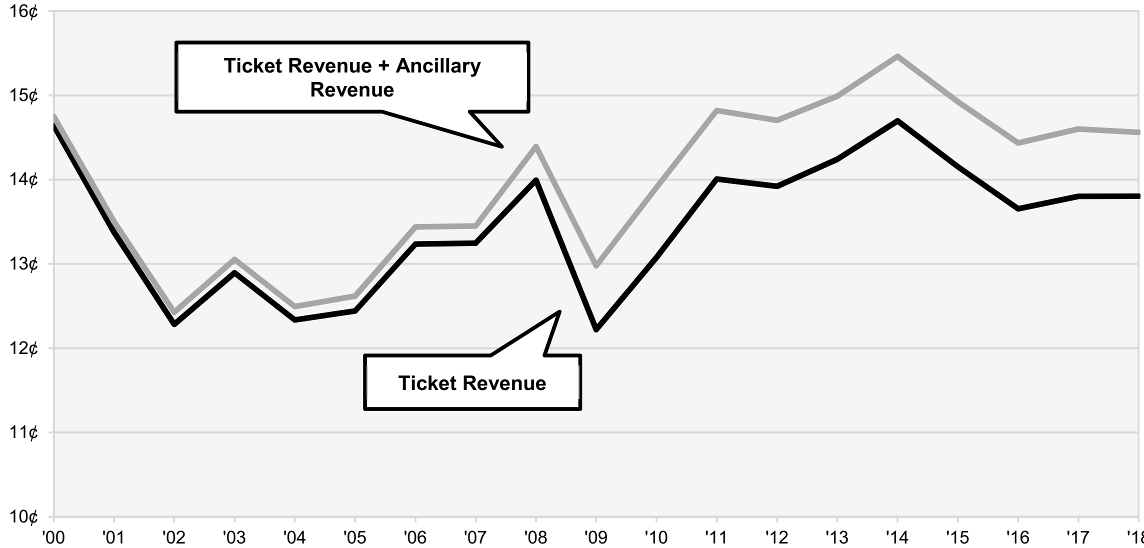
2.5.1 Revenues

The average nominal domestic yield for the U.S. airline industry since 2000 is displayed in Exhibit 2-15. Domestic yields dropped sharply after 2000, but made a significant recovery starting in 2004 as airlines made efforts to capture additional revenue through various strategies such as yield management and product unbundling. Carriers also began to offer à la carte pricing, maintaining a lower base fare, but introducing extra fees for services such as checked baggage and preferential seating ("ancillary fees" are not included in market yield calculations). By 2008, average domestic yield reached 14.0 cents, almost returning to pre-9/11 levels. The global recession in 2008-2009 led to another sharp decline in yields, as passenger demand contracted across the industry. Airlines responded with better capacity management and the expanded use of ancillary fees (as listed above). In 2014, average industry yield recovered to pre-9/11 levels, reaching 14.7 cents excluding ancillary fees and 15.5 cents including certain ancillary fees. However, yields have subsequently declined since 2014, reaching 13.8 cents excluding fees and 14.5 cents including certain fees such as baggage and cancellation fees in CY 2018. This drop in yields between 2015 to 2016 reflected lowered fares due to increased competition, especially from expanded LCC and ULCC service, as well as factors such as the appreciation of the U.S. dollar and its impact on non-U.S. dollar revenues. In the recent year 2018, yields have remained relatively unchanged, declining by less than 0.1 percent.

Revenue from baggage and other fees associated with ancillary products and services has become a key element in the airlines' ability to achieve top-line growth. Starting in 2008-2009, as many U.S. carriers introduced baggage fees for passengers' checked baggage, airline revenue generated by baggage fees has skyrocketed. Baggage fee revenue increased nearly seven-fold in the span of just three years, from $357 million in 2007 to $2.3 billion in 2009. Airlines have continued to unbundle services since 2011, introducing charges for on-board food and beverages, seating with extra legroom, in-flight entertainment, priority boarding, the use of telephone reservation systems, and other services. Reported ancillary revenues currently account for an additional 5.8 percent of revenue on top of ticket revenues. However, as only certain ancillary fees are reported separately[31] in U.S. DOT data filings, this estimate of ancillary yield is most likely understated. Total ancillary revenues (including those not reported separately to the U.S. DOT, such as frequent flyer mileage sales) collected by Major Carriers in 2017 are estimated at $26.9 billion, or close to 14.2 percent of total revenue, which is unchanged from the previous year.[32]

[31] Some fees are aggregated into "Miscellaneous Operating Revenues".
[32] Idea Works/Cartrawler study (2016).

Exhibit 2-15: Domestic Nominal Yields, Revenues per Revenue Passenger Mile (RPM) (in Nominal Terms, CY 2000 to CY 2018)



Note: Ancillary revenue in this graph includes baggage and reservations/change/cancellation fees but excludes fees for premium seating or boarding and other services as these fees are not explicitly shown in U.S. DOT Form 41 data; All U.S. carriers required to report to Form 41 are shown on this graph.

Source: U.S. DOT, Form 41 Database.

As shown in Exhibit 2-16, overall domestic yield, excluding fees, for FSCs and LCCs has decreased by 7.1 percent since 2014, an average decline of 1.0 percent per year. The difference in domestic yields between FSCs and LCCs has widened over the past few years. Average domestic yield for LCCs saw a decrease of 16.0 percent from 14.8 cents in 2014 to 12.4 cents in CY 2018. Over the same period, average domestic yields for FSCs have decreased by 2.4 percent from 15.3 cents in CY 2014 to 15.0 cents in CY 2018, and have risen 1.8 percent in the past year.

Exhibit 2-16: Full Service and Low Cost Carrier Domestic Yields, Passenger Revenues per RPM (CY 2014 to CY 2018)

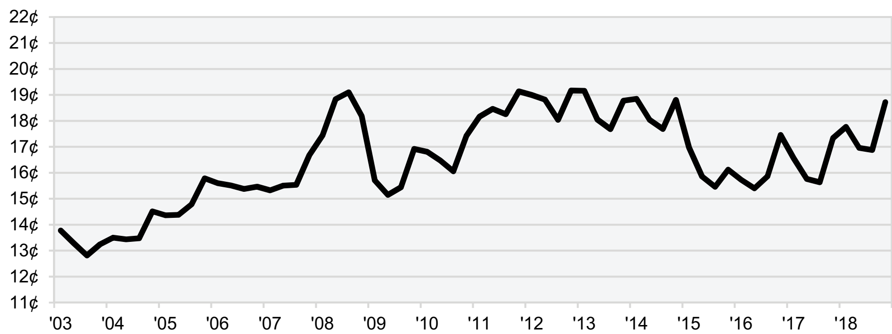
	Domestic Yield					Pct. Change				
Carrier	**2014**	**2015**	**2016**	**2017**	**2018**	**'14- '15**	**'15- '16**	**'16- '17**	**'17- '18**	**'14- '18**
Low Cost Carriers										
Allegiant	10.3¢	9.3¢	9.6¢	8.5¢	8.5¢	-10.2%	3.2%	-11.0%	0.0%	-17.4%
Frontier	12.3¢	9.6¢	8.1¢	6.1¢	5.8¢	-21.9%	-15.6%	-24.6%	-4.6%	-52.6%
JetBlue	14.1¢	14.2¢	15.2¢	13.3¢	13.3¢	1.2%	6.9%	-12.4%	0.0%	-5.2%
Southwest	16.5¢	15.7¢	17.2¢	15.0¢	15.0¢	-4.6%	9.6%	-13.0%	-0.3%	-9.3%
Spirit	8.6¢	7.1¢	7.0¢	6.1¢	6.1¢	-18.2%	-0.7%	-12.4%	-0.7%	-29.3%
Sun Country	13.9¢	11.9¢	12.5¢	11.5¢	10.5¢	-14.0%	4.3%	-7.7%	-8.2%	-24.0%
Average Yield	**14.8¢**	**13.9¢**	**14.7¢**	**12.6¢**	**12.4¢**	**-6.0%**	**5.9%**	**-14.3%**	**-1.4%**	**-15.9%**
Full Service Carriers										
Alaska	13.8¢	13.1¢	14.0¢	12.4¢	13.0¢	-4.5%	6.4%	-11.0%	4.5%	-5.5%
American	15.6¢	14.9¢	16.6¢	15.2¢	15.0¢	-4.0%	11.2%	-8.4%	-1.1%	-3.4%
Delta	16.5¢	16.4¢	17.8¢	15.8¢	16.4¢	-0.8%	8.7%	-11.3%	3.8%	-0.7%
Hawaiian	15.7¢	15.2¢	17.3¢	16.1¢	15.5¢	-2.9%	14.1%	-7.1%	-4.1%	-1.3%
United	14.2¢	13.9¢	15.3¢	13.5¢	14.1¢	-2.2%	10.5%	-12.1%	4.5%	-0.7%
Average Yield	**15.3¢**	**15.0¢**	**16.4¢**	**14.7¢**	**15.0¢**	**-2.5%**	**9.9%**	**-10.5%**	**1.8%**	**-2.4%**
Total/Average	**15.2¢**	**14.6¢**	**15.8¢**	**13.9¢**	**14.1¢**	**-3.8%**	**8.4%**	**-11.9%**	**1.0%**	**-7.1%**

Note: Yield based on passenger ticket revenues only. Excludes ancillary revenue.
Source: U.S. DOT Form 41 Database.

2.5.2 Costs

Airline costs saw a sharp increase from 2003 to 2008, largely driven by increases in fuel prices. Despite efforts by airlines – both FSCs and LCCs – to reduce costs in areas such as labor, aircraft ownership, maintenance, distribution, and other support activities, rising fuel prices continued to push total operating costs higher. Average unit costs rose from approximately 12.8 cents per available seat mile ("ASM") in the third quarter of 2003 to a peak of 19.1 cents at the height of the fuel spike in 2008. After falling to 15.2 cents per ASM in 2Q 2009, average units costs generally trended up again through the first half of 2014, driven by high and volatile fuel prices. A sharp decline in oil prices starting in the second half of 2014 led to a significant drop in unit costs in late 2015. Average unit costs for U.S. carriers increased on average quarterly from 15.5 cents per ASM in 3Q 2015 to 18.7 cents in 4Q 2018 due to the market volatility of crude oil prices and increased labor wage agreements with airline employees and labor unions. The reported 4Q 2018 unit cost per ASM exceeded average quarterly unit costs compared to last year, returning to levels seen between 2012 and 2015.

Exhibit 2-17: U.S. Scheduled Carrier Nominal Operating Costs per ASM (1Q 2003 to 4Q 2018)

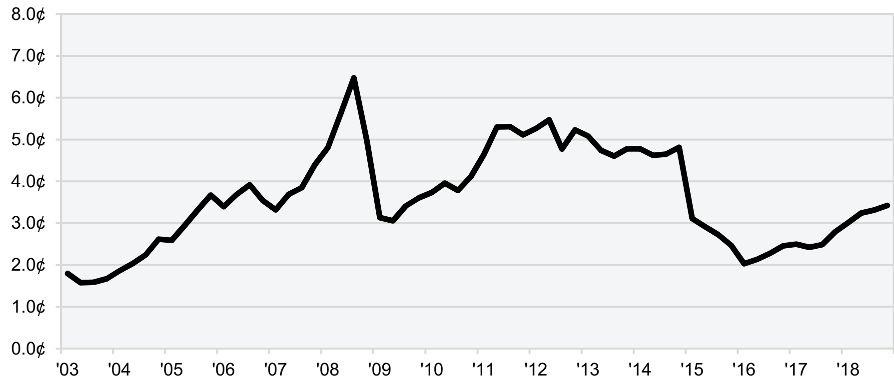


Source: U.S. DOT Form 41 Database.

Fuel cost per ASM more than tripled between 2000 and 2014, rising from approximately 1.6 cents to 4.7 cents per ASM during 2014 (Exhibit 2-18). In 2008, a spike in crude oil prices drove up jet fuel prices to an unprecedented 6.5 cents per ASM in 3Q 2008. Fuel cost per ASM rose again sharply between 2009 and 2014, in part due to unrest in the Middle East, and remained high though volatile through most of 2014. Starting in the second half of 2014, oil prices began to decline sharply, falling from a high of $106 per barrel in June 2014 to $54 per barrel at the end of 2016. The drop in oil prices is linked to the rapid increase in domestic oil production in the United States in recent years, resulting in a reduction in American imports and a glut on world markets. Over the past year and a half, fuel cost per ASM has been on the rise, increasing to 3.4 cents per ASM in 4Q 2018 given the re-strengthening in oil prices. In October 2018, WTI crude oil prices hit a peak of $75 per barrel, and declined shortly thereafter to $49 in December 2018 due to a surge in domestic oil production coupled with increased production from Russia, Saudi Arabia, and other Organization of the Petroleum Exporting Countries ("OPEC"). Since the beginning of 2019, WTI crude oil prices have been on the rise, with prices as of May 2019 at $61.08 per barrel.[33] The U.S. Energy Information Administration ("EIA") short-term energy outlook report forecasts that U.S. crude production will be 12.4 million barrels per day (b/d) in 2019, up 0.5 percent from the April published forecast, and reach 13.4 million b/d in 2020. Oil prices remain volatile given concerns that a U.S.–China trade war could reduce demand and rising tensions in the Middle East could have a negative impact on supply.

[33] Bloomberg Energy, on May 2, 2019.

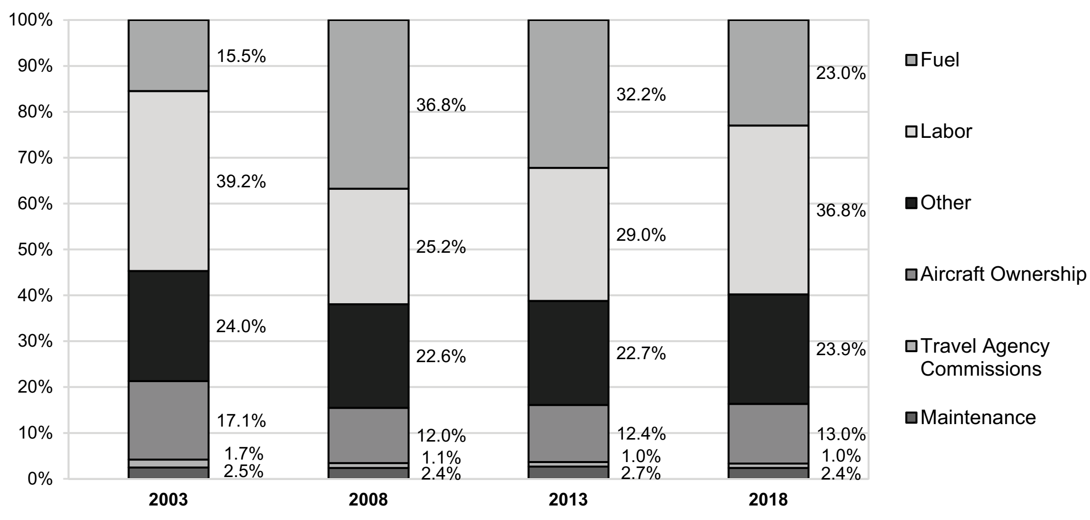
Exhibit 2-18: U.S. Scheduled Carrier Nominal Fuel Cost Per ASM (1Q 2003 to 4Q 2018)



Source: U.S. DOT Form 41 Database.

Exhibit 2-19 below presents U.S. carrier operating expenses by category since 2003. Fuel, as a percentage of total operating costs, climbed from 15.5 percent in 2003 to a peak of 36.8 percent in 2008. The drop in oil prices between 2015-2016 resulted in a substantial decrease in fuel costs, which have now declined to 23.0 percent of operating expense in CY 2018. However, fuel costs are expected to rise in their share of overall costs going into 2019 given the recent volatility in crude oil prices. This volatility poses an ongoing challenge for airlines and a significant potential impact on airline profitability. As fuel costs have declined relative to where they were five years ago, labor now once again represents the largest component of operating costs in CY 2018. Labor costs rose as a percentage of total airline costs (from 25.2 percent in 2008 to 36.8 percent in 2018) due to renegotiations on existing labor contracts between U.S. airlines and their employees (including pilots, flight attendants, maintenance crew) and an increase in the number of U.S. airline employees who have joined airline industry labor unions. Depending on prices in the oil market and labor wage policies, the proportions of operating expenses will change. Aircraft ownership currently represents 13.1 percent of total costs, while other expenses represent 24.0 percent.

Exhibit 2-19: U.S. Scheduled Carrier Share of Operating Expenses by Category (CY 2003 to CY 2018)

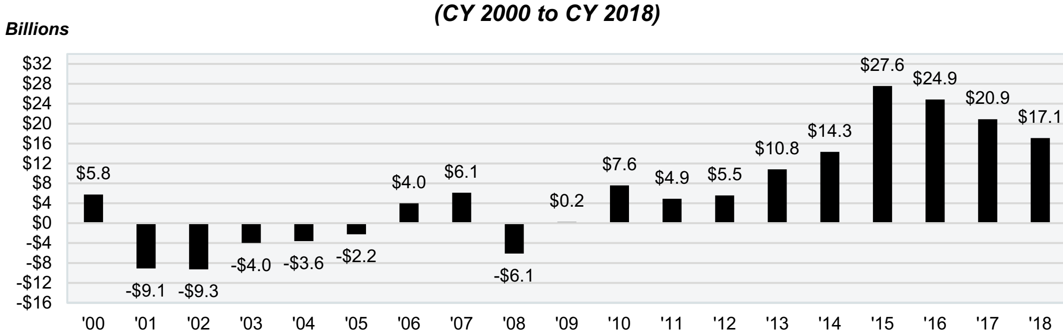


Note: Excludes fees paid to regional carrier affiliates for operating codeshare flights.
Source: U.S. DOT Form 41 Database.

2.5.3 U.S. Airline Profitability

The U.S. airline industry experienced significant losses during 2008 and has subsequently recovered, consistently achieving profits since 2010 (see Exhibit 2-20). Industry losses in 2008 reached $6.1 billion, and thereafter, carriers employed fuel hedging strategies extensively to offset high fuel costs. While this provided some cushion, hedges resulted in losses for some airlines due to the extreme volatility in oil prices. Airlines were forced to reduce losses by sharply curtailing capacity and controlling costs. The top three U.S. carriers, (American, United, and Delta) have adopted a "no-hedging" policy, which helps them when fuel prices are low, while LCCs like Southwest have continued to hedge high portions of their fuel to offset the risk of adverse oil price movements. Despite the lack of a robust economic recovery, the U.S. airline industry regained profitability, especially when the oil market saw a drop in prices in 2015. This market condition lowered operating costs, resulting in operating income nearly doubling between 2014 and 2015. In recent years, U.S. airline operating incomes have been declining due to an increase in fuel costs and competitive market fares resulting from the rise in LCC/ULCC services. U.S. airline operating income was $17.1 billion in CY 2018 based on U.S. DOT Form 41 reported data.

Exhibit 2-20: Operating Income of U.S. Scheduled Airlines, in $ Billions (CY 2000 to CY 2018)

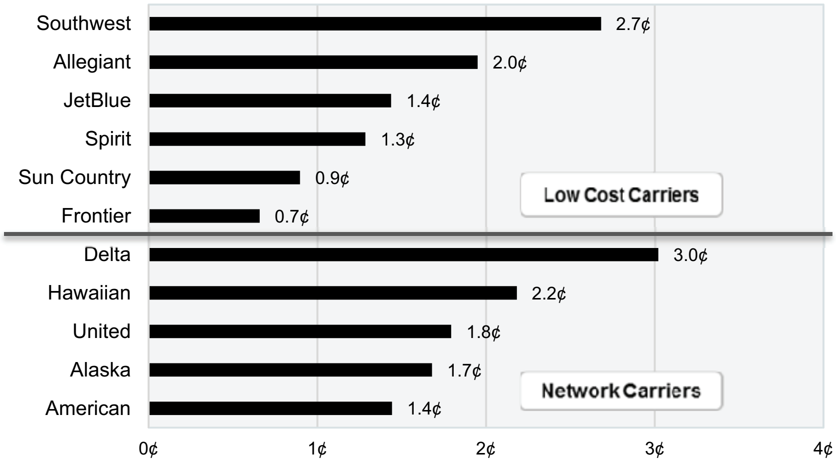


Note: Includes major U.S. passenger airlines (Allegiant, American, Alaska Airlines, Delta, Frontier, Hawaiian, JetBlue, Southwest, Spirit, and United).
Source: U.S. DOT Form 41 Database.

Delta posted the highest operating profit in CY 2018 of approximately $5.5 billion. United posted profits in excess of $3.2 billion while American was fourth, seeing an operating profit of approximately $2.7 billion. The largest of the LCCs, Southwest and JetBlue, achieved operating profits of $3.0 billion and $650 million, respectively. Southwest performed better financially than a majority of U.S. FSCs.

Of U.S. major carriers, Delta, Hawaiian, and Alaska saw the highest profit per available seat mile for FSCs in CY 2018, at 3.0, 2.2, and 1.8 cents, respectively, while American was lowest, at 1.4 cents. For low cost carriers, Southwest had the highest margin, at 2.7 cents profit per available seat mile while Frontier had the lowest margin at 0.7 cents.

Exhibit 2-21: Profit per Available Seat Mile for U.S. Airlines (CY 2018)



Airline	Operating Profit (in Millions) CY 2018
Delta	$5,504
United	3,294
Southwest	3,206
American	2,723
Alaska	687
JetBlue	650
Spirit	351
Hawaiian	329
Allegiant	216
Frontier	120

Note: Includes major U.S. passenger airlines as defined by the U.S. DOT, excluding regional affiliates.
Source: U. S. DOT Form 41 Database.

Overall, a tiered cost structure separation of the industry remains, with the LCCs displaying both lower yields and lower unit costs than the FSCs. Average unit revenues (RASM) and average unit costs (CASM) for both carrier types are shown in Exhibit 2-22. In CY 2018, FSCs reported an average unit cost of 21.1 cents and an average unit revenue of 23.2 cents, while LCCs reported an average unit cost of 14.5 cents and an average unit revenue of 16.6 cents. While the LCCs enjoy a lower cost structure, they also generate less revenue due to lower fares; high unit costs for network carriers are coupled with higher fares.

Exhibit 2-22: Domestic Revenue per Available Seat Mile (RASM) and Cost per Available Seat Mile (CASM) for Full Service and Low Cost Carriers (CY 2018)

Carrier	CY 2018 RASM	CY 2018 CASM	CY 2018 Diff.	Carrier	CY 2018 RASM	CY 2018 CASM	CY 2018 Diff.
Full Service Carriers				**Low Cost Carriers**			
Alaska	20.2¢	18.5¢	1.7¢	Allegiant	14.4¢	12.5¢	2.0¢
American	23.6¢	22.2¢	1.4¢	Frontier	11.8¢	11.2¢	0.7¢
Delta	24.4¢	21.4¢	3.0¢	JetBlue	16.9¢	15.5¢	1.4¢
Hawaiian	18.7¢	16.6¢	2.2¢	Southwest	18.4¢	15.7¢	2.7¢
United	22.5¢	20.7¢	1.8¢	Spirit	12.2¢	10.9¢	1.3¢
				Sun Country	14.9¢	14.0¢	0.9¢
Average	**23.2¢**	**21.1¢**	**2.1¢**	**Average**	**16.6¢**	**14.5¢**	**2.1¢**
				Total/Average	**21.4¢**	**19.3¢**	**2.1¢**

Source: U.S. DOT Form 41 Database.

3. ECONOMIC CHARACTERISTICS OF THE BOSTON LOGAN SERVICE AREA

3.1 Introduction

Air travel demand and airport passenger traffic are highly linked to the economic characteristics of a region. The strong passenger growth experienced at Boston Logan Airport over the past decade, reflects the strong economic characteristics of the Boston Service Area.[34] This region is a central player in the nation's finance, technology, biotechnology, healthcare, and education sectors, which are highly travel dependent, boosting local O&D passenger demand. The Boston area is also a major tourist destination for both domestic and international tourists. As one of the nation's largest population and economic centers, Boston is a growing market with a per capita income of $61,328 (2017),[35] which is 35.3 percent above the U.S. average, and has the second lowest unemployment rate amongst large metropolitan areas in the country (2.7 percent as of March 2019).[36] Such favorable economic conditions contribute to the region's sustained demand for air travel. Future GDP growth of the region is anticipated to track closely with national growth rates, but with per capita GDP growing faster than the national average. The strong underlying economic conditions all suggest continued growing demand for air travel through Boston Logan Airport over the medium and long term.

Following the economic downturn of 2008-2009, the Massachusetts economy recovered, and it has maintained steady and consistent growth since 2014. The Boston Service Area ranks ninth among U.S. metropolitan areas in terms of economic output, with economic growth between 2010 and 2017 exceeding the national average.[37] In 2018, economic growth in The Commonwealth of Massachusetts ("the Commonwealth") closely tracked the nation's economic growth.[38] Massachusetts has benefitted from improving economic conditions in the U.S. and has been further buoyed by its strong reliance on the growing technology sector.

Forecasts for near-term economic growth in the Commonwealth indicate that economic output is expected to be constrained in 2019 due to demographic factors and the waning impact of federal tax cuts.[39] Personal income for the Commonwealth and the Boston Service Area is forecast to grow by 1.6 percent annually over the long-term (2017-2037).[40]

This section of the report covers various economic indicators for Massachusetts and the metro Boston region and the outlook for long-term demographic and economic growth.

3.2 Review of Massachusetts Economic Trends

3.2.1 Economic Output

Exhibit 3-1 shows historical year-over-year GDP growth for Massachusetts and the U.S. through 2018, as well as 2018 quarter-over-quarter growth rates in 2017 and 2018. Similar to the rest of the nation, the Massachusetts economy was seriously affected by the U.S. subprime mortgage crisis and economic recession in 2008-2009, but it rebounded in 2010. Massachusetts recovered at a slightly faster pace than the rest of the country, with the state's GDP growth surpassing national GDP growth in 2010 and 2011. After a period of stagnation in 2013, Massachusetts' GDP growth picked up, increasing by at least 1.9 percent each year since. In 2018, GDP growth in the Commonwealth was 2.7%, just under the national growth rate of 2.9%.[41]

Over the past 20 years, Massachusetts GDP as a percentage of U.S. GDP has ranged between 2.6 percent and 2.8 percent. Considering its population base, the Commonwealth has a disproportionately high contribution to the national economic output. For example, in 2017, Massachusetts accounted for approximately 2.7 percent of U.S. GDP,[42] though only accounting for 2.1 percent of total U.S. population.[43]

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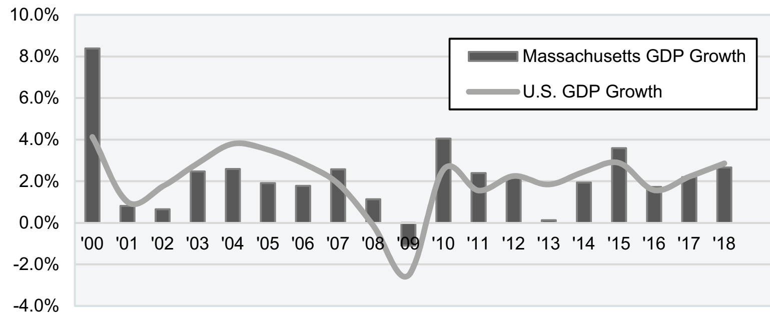
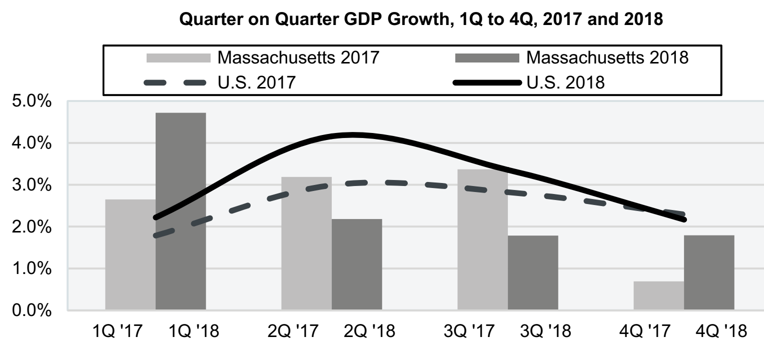
[34] The Boston Service Area includes Bristol, Essex, Middlesex, Norfolk, Plymouth, Suffolk, and Worcester counties; as identified in the Glossary (page C-7).
[35] Woods & Poole Economics. Personal income per capita in 2009 dollars for the Boston Service Area. Values for 2017 are estimates.
[36] Bureau of Labor Statistics.
[37] Woods & Poole Economics. Gross Regional Product in constant 2009 dollars for the BSA. Values for 2017 are estimates.
[38] Bureau of Economic Analysis (BEA), May 2019.
[39] MassBenchmarks (an initiative of the University of Massachusetts Donahue Institute and Federal Reserve Bank of Boston), "Current and Leading Indexes", January 2019.
[40] Woods & Poole Economics. Estimated.
[41] Bureau of Economic Analysis (BEA).
[42] Ibid.
[43] Woods & Poole Economics.

Exhibit 3-1: Annual Growth in Massachusetts GDP and U.S. GDP (2000-2018)





Note: Growth rates are based on Real GDP chained on 2012 dollars. Percentage changes are annualized.
Source: U.S. Department of Commerce, Bureau of Economic Analysis (BEA)

3.2.2 Employment

The Boston metropolitan area maintains one of the largest employee bases in the nation, as shown in Exhibit 3-2. Boston is ranked 9th in the nation with over 2.7 million employees estimated as of March 2019, compared to a population rank of 10th.[44] Showing stable growth, Boston area employment was up 0.5 percent from March 2018, compared to a 0.7 percent increase over the same time period from 2017 to 2018.

[44] Woods & Poole Economics. Boston is based on Metropolitan Statistical Areas for United States, which includes Boston-Cambridge-Newton, MA-NH.

Exhibit 3-2: Non-Agricultural Employment for Major Metropolitan Areas and Total U.S. (March 2018 to March 2019)

Metropolitan Area	Employment Rank	Non-Farm Employees (000)		Net Change	Pct Change	Rank by Percent Change
		Mar 2019 (p)	Mar 2018			
New York-Newark-Jersey City	1	9,845.9	9,722.6	123.3	1.3%	9
Los Angeles-Long Beach-Anaheim	2	6,192.7	6,140.8	51.9	0.8%	12
Chicago-Naperville-Elgin	3	4,718.2	4,678.3	39.9	0.9%	11
Dallas-Fort Worth-Arlington	4	3,750.2	3,639.5	110.7	3.0%	1
Washington-Arlington-Alexandria	5	3,308.3	3,278.8	29.5	0.9%	10
Houston-The Woodlands-Sugar Land	6	3,132.0	3,064.2	67.8	2.2%	5
Philadelphia-Camden-Wilmington	7	2,948.1	2,909.7	38.4	1.3%	8
Atlanta-Sandy Springs-Roswell	8	2,819.6	2,759.3	60.3	2.2%	6
Boston-Cambridge-Nashua	**9**	**2,749.9**	**2,737.1**	**12.8**	**0.5%**	**14**
Miami-Fort Lauderdale-West Palm Beach	10	2,735.7	2,680.2	55.5	2.1%	7
San Francisco-Oakland-Hayward	11	2,478.9	2,416.9	62.0	2.6%	4
Phoenix-Mesa-Scottsdale	12	2,159.7	2,101.2	58.5	2.8%	2
Seattle-Tacoma-Bellevue	13	2,075.1	2,021.9	53.2	2.6%	3
Detroit-Warren-Dearborn	14	2,022.0	2,010.4	11.6	0.6%	13
Minneapolis-St. Paul-Bloomington	15	1,976.3	1,976.4	-0.1	0.0%	15
Sub Total:		**52,912.6**	**52,137.3**	**775.3**	**1.5%**	
Rest Of U.S.		96,949.4	95,230.7	1,718.7	1.8%	
Total U.S.		**149,862.0**	**147,368.0**	**2,494.0**	**1.7%**	

Note: Data are counts of jobs by place of work. Area delineations are based on Office of Management and Budget Bulletin No. 15-01, dated July 15, 2015, and are available on the BLS website at www.bls.gov/lau/lausmsa.htm. Areas in the six New England states are Metropolitan New England City and Town Areas (NECTAs), while areas in other states are county-based. Some metropolitan areas lie in two or more states. Estimates for the latest month are subject to revision the following month. Principal cities in the Boston-Cambridge-Nashua, MA-NH Metropolitan NECTA include Boston, MA, Cambridge, MA, Nashua, NH, Newton, MA, Framingham, MA, and Waltham, MA. Not seasonally adjusted.

* Area boundaries do not reflect official OMB definitions.
(p) Preliminary figures.

Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS).

The leading industries as categorized by the U.S. Department of Commerce, for employment (accounting for approximately half of non-farm employees) in Boston[45] and Massachusetts are: Education & Health Services; Professional & Business Services; and Trade, Transportation, & Utilities. As reflected in Exhibit 3-3, preliminary figures for March 2019 show that Education & Health Care Services account for 21.6 percent of Boston's non-farm employees; Professional & Business Services account for 18.0 percent; and Trade, Transportation, & Utilities represent approximately 15.3 percent of non-farm employees in Boston.

[45] Employment ranking for Boston is based on Metropolitan Statistical Areas for United States, which includes Boston-Cambridge-Nashua, MA-NH

Exhibit 3-3: Non-Agricultural Employment by Industry Sector for Boston,[46] Massachusetts, and the U.S. (March 2018 to March 2019)

	March 2019 (p) Non-Farm Employees (000)			March 2018 Non-Farm Employees (000)			Percent Change from Prior Year		
Industry Sector	**U.S.**	**MA**	**BOS***	**U.S.**	**MA**	**BOS***	**U.S.**	**MA**	**BOS**
Education & Health Services	20,987.0	812.3	593.2	20,462.0	801.5	588.8	2.6%	1.3%	0.7%
Professional & Business Services	8,571.0	574.5	494.7	8,476.0	568.1	485.0	1.1%	1.1%	2.0%
Trade, Transportation, & Utilities	12,766.0	571.6	419.2	12,521.0	568.1	414.6	2.0%	0.6%	1.1%
Government	5,837.0	466.5	319.6	5,761.0	460.1	314.9	1.3%	1.4%	1.5%
Leisure & Hospitality	24,130.0	345.4	256.0	23,620.0	351.9	258.4	2.2%	-1.8%	-0.9%
Manufacturing	7,066.0	242.2	186.9	6,840.0	243.1	187.9	3.3%	-0.4%	-0.5%
Financial Activities	2,798.0	219.4	182.2	2,807.0	220.0	181.3	-0.3%	-0.3%	0.5%
Construction	7,066.0	145.2	111.8	6,840.0	146.0	107.7	3.3%	-0.5%	3.8%
Other Services	15,997.0	137.5	102.7	15,588.0	135.8	100.8	2.6%	1.3%	1.9%
Information	27,474.0	91.7	81.6	27,198.0	90.4	79.7	1.0%	1.4%	2.4%
Mining & Logging	744.0	0.9		695.0	1.0		7.1%	-10.0%	n/a
Total	**133,436.0**	**3,607.2**	**2,747.9**	**130,808.0**	**3,586.0**	**2,719.1**	**2.0%**	**0.6%**	**1.1%**
Percent of Total							**MA More/Less than US**		
Education & Health Services	**15.7%**	**22.5%**	**21.6%**	**15.6%**	**22.4%**	**21.7%**	**6.8%**		
Professional & Business Services	**6.4%**	**15.9%**	**18.0%**	**6.5%**	**15.8%**	**17.8%**	**9.5%**		
Trade, Transportation, & Utilities	9.6%	15.8%	15.3%	9.6%	15.8%	15.2%	6.3%		
Government	4.4%	12.9%	11.6%	4.4%	12.8%	11.6%	8.6%		
Leisure & Hospitality	18.1%	9.6%	9.3%	18.1%	9.8%	9.5%	-8.5%		
Manufacturing	5.3%	6.7%	6.8%	5.2%	6.8%	6.9%	1.4%		
Financial Activities	2.1%	6.1%	6.6%	2.1%	6.1%	6.7%	4.0%		
Construction	5.3%	4.0%	4.1%	5.2%	4.1%	4.0%	-1.3%		
Other Services	12.0%	3.8%	3.7%	11.9%	3.8%	3.7%	-8.2%		
Information	20.6%	2.5%	3.0%	20.8%	2.5%	2.9%	-18.0%		
Mining & Logging	0.6%	0.0%	0.0%	0.5%	0.0%	0.0%	-0.5%		
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**			

Note: The non-farm employees' statistics are not seasonally adjusted.

*Areas in the six New England states are Metropolitan New England City and Town Areas (NECTAs); Principal cities in the Boston-Cambridge-Nashua, MA-NH Metropolitan NECTA include Boston, MA, Cambridge, MA, Nashua, NH, Newton, MA, Framingham, MA, and Waltham, MA; Boston's natural resources & mining is included under Construction

(p) Preliminary figures.

Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS).

Since 2001, employment in the Education & Health Services sector has increased the fastest at 1.6 percent on average per year, while the Manufacturing sector showed the largest decline (Exhibit 3-4). Education & Health Services increased from 16.3 percent to 21.6 percent of the Boston-Cambridge-Nashua, MA-NH Metropolitan area non-agricultural employment from 2001 to 2019. Manufacturing decreased from 11.8 percent of non-agricultural employment in 2001 to 6.8 percent in 2019.

[46] Boston is based on Metropolitan Statistical Areas for United States, which includes Boston-Cambridge-Nashua, MA-NH

Exhibit 3-4: Non-Agricultural Employment by Industry Sector for Boston[47]
(March 2001 to March 2019)

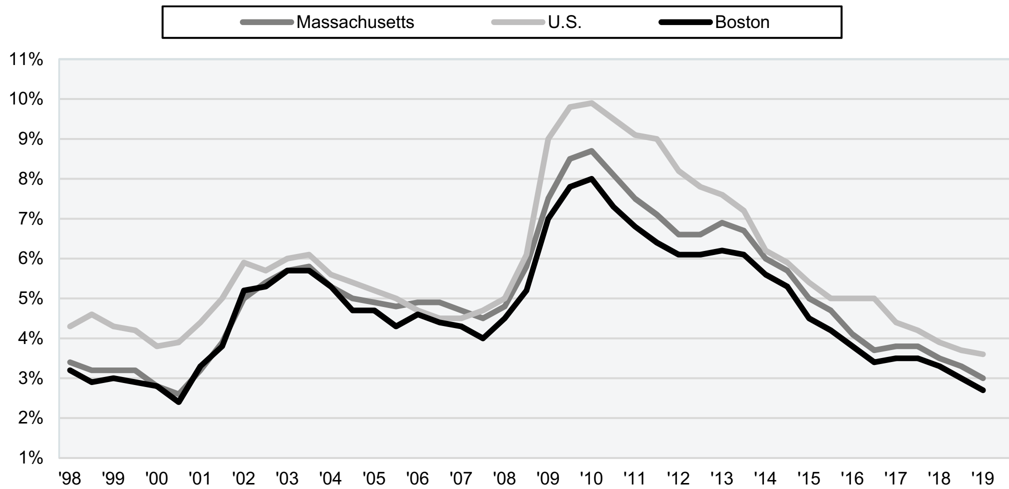
Industry Sector	March 2001	March 2011	March 2019	Percent Change 01-11	Percent Change 11-19	Percent Change 01-19	Net Change (000s) 01-11	Net Change (000s) 11-19	Net Change (000s) 01-19
Education & Health Services	410.3	513.4	593.2	2.3%	1.8%	2.1%	103.1	79.8	182.9
Trade, Transportation, & Utilities	438.4	390.6	419.2	-1.1%	0.9%	-0.2%	(47.8)	28.6	(19.2)
Professional & Business Services	412.1	393.1	494.7	-0.5%	2.9%	1.0%	(19.0)	101.6	82.6
Government	305.4	307.5	319.6	0.1%	0.5%	0.3%	2.1	12.1	14.2
Leisure & Hospitality	189.7	213.2	256.0	1.2%	2.3%	1.7%	23.5	42.8	66.3
Manufacturing	297.3	192.8	186.9	-4.2%	-0.4%	-2.5%	(104.5)	(5.9)	(110.4)
Financial Activities	193.3	174.6	182.2	-1.0%	0.5%	-0.3%	(18.7)	7.6	(11.1)
Other Services	85.1	93.5	102.7	0.9%	1.2%	1.0%	8.4	9.2	17.6
Mining, Logging, & Construction	95.2	70.6	111.8	-2.9%	5.9%	0.9%	(24.6)	41.2	16.6
Information	96.1	71.7	81.6	-2.9%	1.6%	-0.9%	(24.4)	9.9	(14.5)
Total	**2,522.9**	**2,421.0**	**2,747.9**	**-0.4%**	**1.6%**	**0.5%**	**(101.9)**	**326.9**	**225.0**
Percent of Total									
Education & Health Services	16.3%	21.2%	21.6%	2.7%	0.2%	1.6%			
Trade, Transportation, & Utilities	17.4%	16.1%	15.3%	-0.7%	-0.7%	-0.7%			
Professional & Business Services	16.3%	16.2%	18.0%	-0.1%	1.3%	0.5%			
Government	12.1%	12.7%	11.6%	0.5%	-1.1%	-0.2%			
Leisure & Hospitality	7.5%	8.8%	9.3%	1.6%	0.7%	1.2%			
Manufacturing	11.8%	8.0%	6.8%	-3.8%	-2.0%	-3.0%			
Financial Activities	7.7%	7.2%	6.6%	-0.6%	-1.0%	-0.8%			
Other Services	3.4%	3.9%	3.7%	1.4%	-0.4%	0.6%			
Mining, Logging, & Construction	3.8%	2.9%	4.1%	-2.5%	4.3%	0.4%			
Information	3.8%	3.0%	3.0%	-2.5%	0.0%	-1.4%			
Total	**100.0%**	**100.0%**	**100.0%**						

Note: Areas in the six New England states are Metropolitan New England City and Town Areas (NECTAs); Principal cities in the Boston-Cambridge-Nashua, MA-NH Metropolitan NECTA include Boston, MA, Cambridge, MA, Quincy, MA, Nashua, NH, Newton, MA, Framingham, MA, Waltham, MA, and Peabody, MA. Employment numbers are not seasonally adjusted. March 2019 values are preliminary.
Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS).

For most of the past two decades, unemployment rates in Massachusetts and the Boston-Cambridge-Nashua, MA-NH Metropolitan area[48] have been below the national rate (Exhibit 3-5). The financial crisis that began in 2008 sent unemployment rates soaring across the United States. The national unemployment rate increased from 4.4 percent in 2007 to over nine percent from 2009-2011, peaking at 10.0 percent in October 2009[49]. Over the same period, Boston's unemployment rate was consistently below the state and national average, with a peak of 8.6 percent in January 2010. As the economy has recovered, national unemployment has declined since its 2009 peak. As of March 2019, the national unemployment rate stood at 3.8 percent while Boston's unemployment rate was 2.7 percent.

[47] Boston is based on Metropolitan Statistical Areas for United States, which includes Boston-Cambridge-Nashua, MA-NH
[48] As identified by the U.S. Department of Commerce, Bureau of Labor Statistics.
[49] U.S. Department of Commerce, Bureau of Labor Statistics.

Exhibit 3-5: Unemployment Rates for Boston, Massachusetts, and the U.S. (March and August, 1998 to 2019)



Note: Boston refers to the Metropolitan Area. Areas in the six New England states are Metropolitan New England City and Town Areas (NECTAs); Principal cities in the Boston-Cambridge-Nashua, MA-NH Metropolitan NECTA include Boston, MA, Cambridge, MA, Quincy, MA, Nashua, NH, Newton, MA, Framingham, MA, Waltham, MA, and Peabody, MA. Employment numbers are not seasonally adjusted for the Boston Metropolitan Area. March 2019 values are preliminary.
Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS).

As of March 2019, the Boston area's unemployment rate ranked the second lowest among the nation's large metropolitan areas (Exhibit 3-6). According to the U.S. Department of Commerce, the unemployment rate for the Boston metropolitan area as of March 2019 was 2.7 percent, down from 3.3 percent in March 2018. Boston's unemployment rate has declined considerably, in part due to the creation of technology jobs and increased corporate IT spending within the expanding industry sectors.

Exhibit 3-6: Large Metropolitan Areas with Unemployment At or Under 4.0% (March 2019 Rankings)

Rank	Metropolitan Area	Mar. 2019 (p) Unemployment Rate	Rank	Metropolitan Area	Mar. 2019 (p) Unemployment Rate
Under 4.0% Unemployment					
1	Nashville-Davidson-Murfreesboro-Franklin	2.6	21	Birmingham-Hoover	3.4
2	**Boston-Cambridge-Nashua**	**2.7**	22	Indianapolis-Carmel-Anderson	3.5
3	Austin-Round Rock	2.7	23	Atlanta-Sandy Springs-Roswell	3.6
4	Denver-Aurora-Lakewood	2.9	24	Minneapolis-St. Paul-Bloomington	3.6
5	San Francisco-Oakland-Hayward	3.0	25	Cincinnati	3.6
6	Orlando-Kissimmee-Sanford	3.0	26	Raleigh	3.6
7	San Jose-Sunnyvale-Santa Clara	3.0	27	New Orleans-Metairie	3.6
8	Oklahoma City	3.0	28	Houston-The Woodlands-Sugar Land	3.7
9	Salt Lake City	3.0	29	Philadelphia-Camden-Wilmington	3.7
10	San Antonio-New Braunfels	3.1	30	San Diego-Carlsbad	3.7
11	Milwaukee-Waukesha-West Allis	3.2	31	Charlotte-Concord-Gastonia	3.7
12	Jacksonville	3.2	32	Kansas City	3.8
13	Richmond	3.2	33	Las Vegas-Henderson-Paradise	3.8
14	Grand Rapids-Wyoming	3.2	34	Providence-Warwick	3.8
15	Dallas-Fort Worth-Arlington	3.3	35	New York-Newark-Jersey City	3.9
16	Washington-Arlington-Alexandria	3.3	36	Baltimore-Columbia-Towson	3.9
17	Miami-Fort Lauderdale-West Palm Beach	3.3	37	Pittsburgh	3.9
18	Tampa-St. Petersburg-Clearwater	3.3	38	Memphis	3.9
19	Columbus	3.4	39	St. Louis	4.0
20	Virginia Beach-Norfolk-Newport News	3.4	40	Louisville/Jefferson County	4.0

NOTE: Rates shown are a percentage of the labor force. Data refer to place of residence. Estimates for the current month are subject to revision the following month.
(p) Preliminary figures.
Source: U.S. Department of Commerce, Bureau of Labor Statistics (BLS).

3.2.2.1 Employers

As shown in Exhibit 3-7, 16 Fortune 500 companies are headquartered in Massachusetts. In 2018, revenues for the Massachusetts-based Fortune 500 firms ranged from $6.2 billion (Analog Devices) to $120.3 billion (General Electric). These companies span different industry sectors including technology, finance, retail, aerospace, healthcare, energy, and food and beverages. Thirteen of the same companies appeared in the 2018 list, while BJ'S Wholesale Club, Wayfair, and Analog Devices are new additions to the list, indicating a growing business base in Massachusetts. Ten of the companies have moved ahead on the list and have grown in revenues since 2017. General Electric[50] saw a decline in revenues as well as global employee count from 2017 to 2018. After announcing in early 2019 that it would scale down its plan to create 800 new jobs at its new Boston Seaport District headquarters, the conglomerate has publicly emphasized that Boston will remain its headquarter city, and they are proud to call it home.

Exhibit 3-7: Massachusetts Fortune 500 Companies (Ranked by 2018 Revenue)

2019 MA	2019 Nation	2018 Nation	2017 Nation	Company (Location)	Industry	2018 Rev. ($ Billions)	Employees (thousands)
1	21	18	13	General Electric (Boston)	Industrial Machinery	$120.3	283.0
2	75	68	75	Liberty Mutual Insurance Group (Boston)	Insurance: Property and Casualty	$42.7	50.0
3	84	93	77	Mass.Mutual Life Insurance (Springfield)	Insurance: Life and Health	$39.3	9.8
4	85	85	87	TJX (Framingham)	Specialty Retailers: Apparel	$39.0	270.0
5	114	119	116	Raytheon (Waltham)	Aerospace and Defense	$27.0	67.0
6	124	144	154	Thermo Fisher Scientific (Waltham)	Scientific, Photographic, and Control Equip.	$24.4	69.2
7	235	245	248	Biogen Idec (Cambridge)	Pharmaceuticals	$13.5	7.8
8	245	N/A	N/A	BJ's Wholesale Club (Westborough)	General Merchandising	$13.0	26.4
9	247	259	271	State Street Corp. (Boston)	Commercial Banks	$13.0	40.1
10	254	331	334	Global Partners (Waltham)	Wholesalers: Diversified	$12.7	2.5
11	319	328	327	Boston Scientific (Marlborough)	Medical Products and Equipment	$9.8	32.0
12	358	364	358	Eversource Energy (Springfield)	Utilities: Gas and Electric	$8.4	8.0
13	409	418	416	Keurig Dr Pepper (Burlington)	Beverages	$7.4	25.5
14	410	419	449	American Tower (Boston)	Real Estate	$7.4	5.0
15	446	N/A	N/A	Wayfair (Boston)	Internet Services and Retailing	$6.8	12.1
16	472	N/A	N/A	Analog Devices (Norwood)	Semiconductors and Electronic Components	$6.2	15.8

Note: The Fortune 500 excludes private companies that do not file financial statements with a government agency; companies incorporated outside the U.S.; and U.S. companies owned or controlled by other companies, domestic or foreign, that file with a government agency. Employees are global figures. Revenues and employee numbers are as reported by Fortune. Revenues are for the last fiscal year.
Source: Fortune website.

3.2.2.2 Leading Massachusetts Industries

Six major industries have posted large contributions to the Boston region's economy since the early 1990s and currently account for approximately one half of the Boston area employment base.

These leading industries are:

- High technology
- Biotechnology
- Health care
- Financial services
- Higher Education
- Tourism

High Technology

The high technology industry encompasses a number of economic activities that cut across traditional definitions of industrial sectors. Massachusetts high technology companies are heavily involved in computer software and related information technology development, research and development related to new technology products and procedures, and the manufacture and/or distribution of computer and electronic related equipment. Boston based

[50] GE's current strategy is to focus on three business units: aviation, power, and renewable energy (WBUR,org, February 2019).

companies like Analog Devices, Nuance Communications, Skyworks Solutions, and Akamai Technologies all employ thousands of Massachusetts workers within the technology industry.

Biopharmaceutical

Boston is one of the leading centers for biopharma (including pharmaceuticals and medical devices) in the U.S. The existence of a well-trained and highly educated work force and the wealth of medical and higher education facilities and personnel in the region make the Boston area one of the most desirable locations in the nation for the biotechnology industry. The biopharma industry employed nearly 70,000 people in Massachusetts in 2017.[51] Companies like Sanofi Genzyme, Philips, Thermo Fisher Scientific, Shire, Takeda Pharmaceutical, and Boston Scientific Corp., all with large offices in the Boston Area, contribute substantially to the biotechnology industry.[52]

Health Care

Boston has a world-renowned reputation as a leader in the health care industry, which is a strong driver of the local economy. From medical education to training, research and the provision of medical services, Boston's medical institutions perform a wide variety of activities. The large amount of research and health care related activities at these institutions also act as a driver of other health care related industries, such as the biotech industry. Hospitals in the Boston metro area accounted for over 155,000 full-time employees in 2018[53] Massachusetts General Hospital, Brigham and Women's Hospital, and UMass Memorial Medical Center are the three largest hospitals in the Boston area.

Financial Services

The Boston area is also a leader in the financial services industry. A substantial number of mutual fund companies, hedge funds, venture capital firms and wealth management and financial advisory companies are based in or have significant operations in Boston, including Fidelity, State Street, and John Hancock Financial.

Education

Massachusetts is the home of some of the nation's most prestigious colleges and universities. These higher education institutions attract undergraduate and graduate students from across the U.S. and around the world, generating increased demand for air travel. The top three regional institutions, including Harvard University, Boston University, and Northeastern University, have a combined total enrollment of nearly 120,000 students.[54] These institutions play an important role in the regional economy, not only in terms of their direct workforce but also by spawning important scientific research that in turn leads to industry developments. A significant portion of the region's growth in high technology, biotechnology, financial services and health care emanates from the graduates and research produced by the area's universities. These well-known universities also provide a continuous supply of well-educated and highly trained workers for Boston's economy.

Tourism

Tourism is an integral part of the Massachusetts economy. Millions of people visit Massachusetts and Boston every year to enjoy its rich historic and cultural heritage, attend cultural or sporting events, conduct business, visit nearby beaches in the area, and attend conventions at one of Boston's convention centers. Massachusetts received 27.7 million visitors in 2017. Visitor spending in the Commonwealth during the same time-period supported over 122,000 jobs and a payroll totaling $4.4 billion.[55] Domestic and international travelers in Massachusetts spent $18.7 billion on transportation, lodging, food, entertainment, recreation and retail shopping in 2017.[56]

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[51] Massachusetts Biotechnology Council, 2018; U.S. Bureau of Labor Statistics.
[52] Boston Business Journal, *Largest Life Science Companies in Massachusetts,* 2018.
[53] Website of the Executive Office of Labor and Workforce Development (EOLWD).
[54] Boston Business Journal, *Largest Colleges and Universities in Massachusetts,* 2018.
[55] MOTT TravelStats Newsletter – January, 2019.
[56] Ibid.

3.3 Historical Socioeconomic Trends and Future Outlook

3.3.1 Population

Massachusetts has a slow growing population base compared to the U.S. overall, but the Commonwealth's population is tightly clustered within the Boston metro area. As of July 1, 2017, the Massachusetts Data Center estimates that population density was 879.5 persons per square mile versus 92.2 on a national level. Only three states are reported to be more concentrated than Massachusetts: Rhode Island, New Jersey, and Vermont.[57] As of 2017, the population within the Boston Service Area was estimated at 5.8 million.[58] As shown in Exhibit 3-8, since 2007, the population of the Boston Service Area has grown marginally faster than the Massachusetts population, but slower than the U.S. population as a whole during this period. From 2007 to 2017, the Boston Service Area population grew by 0.7 percent annually, while the U.S. population as a whole grew by 0.8 percent annually.

Exhibit 3-8: Historical and Forecast Regional and National Population Growth (2007 to 2032)

	Historical		Estimated	Forecast		
	2007	2012	2017	2022	2027	2032
Population (in 000s)						
Boston Service Area	5,365.5	5,587.3	5,770.4	5,936.7	6,103.2	6,260.4
Massachusetts	6,431.6	6,658.0	6,844.0	7,031.8	7,219.6	7,396.0
New England	14,279.2	14,581.2	14,807.9	15,228.3	15,649.1	16,046.0
Total U.S.	301,231.2	313,998.3	325,888.1	341,327.7	357,430.5	373,666.8
Boston Service Area Population as a Percent of:						
% of Massachusetts	83.4%	83.9%	84.3%	84.4%	84.5%	84.6%
% of New England	37.6%	38.3%	39.0%	39.0%	39.0%	39.0%
% of U.S. Total	1.8%	1.8%	1.8%	1.7%	1.7%	1.7%
	10 Years	**5 Years**	**5 Years**	**5 Years**	**5 Years**	**15 Years**
Average Annual Growth	**'07-'17**	**'12-'17**	**'17-'22**	**'22-'27**	**'27-'32**	**'17-'32**
Boston Service Area	0.7%	0.6%	0.6%	0.6%	0.5%	0.5%
Massachusetts	0.6%	0.6%	0.5%	0.5%	0.5%	0.5%
New England	0.4%	0.3%	0.6%	0.5%	0.5%	0.5%
Total U.S.	0.8%	0.7%	0.9%	0.9%	0.9%	0.9%

Note: The Boston Service Area includes Bristol, Essex, Middlesex, Norfolk, Plymouth, Suffolk, and Worcester counties; 1969-2016 Woods & Poole population data is historical from the U.S. Department of Commerce; Numbers for 2017 are estimates.
Source: Woods & Poole Economics, 2018.

Population growth for the Boston Service Area is forecast by Woods & Poole Economics[59] to increase by 0.5 percent annually through 2032, which matches the anticipated growth for both Massachusetts and New England (Exhibit 3-8). The Boston Service Area is a mature, densely populated region, and as a result, population is forecast to grow more slowly than the national average; the U.S. average annual population growth rate is forecast at 0.9 percent through 2032.

3.3.2 Personal Income and Per Capita Income

Personal income for the Boston Service Area has historically increased at a similar rate as personal income for New England and the U.S. However, from 2007 to 2017, total personal income for the Boston Service Area grew by 2.1 percent annually, compared to 1.5 percent for New England and 1.8 percent for the nation (as seen in Exhibit 3-9). This was driven by higher average annual personal income growth rates between 2012 and 2017. Boston Service Area and Massachusetts personal income growth rates for this period were 2.7 percent and 2.5 percent, respectively, compared with 2.4 percent for the U.S.

[57] Massachusetts State Data Center, Due Diligence Report, Third Quarter FY2018.
[58] Woods & Poole, published in April 2018.
[59] Woods & Poole Economics is a Washington-based economic research, forecasting and data services firm that specializes in developing forecasts of economic and demographic information derived from U.S. Census data.

Per capita income levels in Boston have been consistently higher than those of the New England region and the rest of the U.S. In 2017, the Boston Service Area's per capita income was estimated at $61,328, approximately 8.7 percent higher than New England's per capita income and 35.3 percent higher than the U.S. average. Per capita income in the Boston Service Area as well as in Massachusetts increased at an average annual rate of 1.9 percent in the 5-year period between 2012 and 2017 after the 2008/2009 recession. During the same period, New England per capita income grew at 1.5 percent annually and national per capita income grew at 1.7 percent annually.

From 2017 to 2032, total personal income in the Boston Service Area, reflecting growth in population and average income, is forecast to grow at 1.7 percent annually, while per capita income is forecast to grow at 1.2 percent annually (Exhibit 3-9). For this time period, personal income growth for Boston is projected to be comparable with growth for New England (expected at 1.7 percent), but lag the national U.S. projected growth of 2.1 percent.

Exhibit 3-9: Historical and Forecast Regional and National Income Growth (2007 to 2032)

	Historical		Estimated	Forecast		
	2007	2012	2017	2022	2027	2032
Total Personal Income (Millions)						
Boston Service Area	$289,745	$311,330	$353,887	$389,782	$424,708	$457,586
Massachusetts	$333,937	$358,822	$406,016	$447,060	$487,022	$524,414
New England	$723,526	$765,708	$835,778	$920,294	$1,002,318	$1,078,495
Total U.S.	$12,353,421	$13,102,482	$14,773,992	$16,554,354	$18,351,055	$20,085,547
Boston Service Area Population as a Percent of:						
% of Massachusetts	86.8%	86.8%	87.2%	87.2%	87.2%	87.3%
% of New England	40.0%	40.7%	42.3%	42.4%	42.4%	42.4%
% of U.S. Total	2.3%	2.4%	2.4%	2.4%	2.3%	2.3%
	10 Years	**5 Years**	**5 Years**	**5 Years**	**5 Years**	**15 Years**
Average Annual Growth	**'07-'17**	**'12-'17**	**'17-'22**	**'22-'27**	**'27-'32**	**'17-'32**
Boston Service Area	2.0%	2.6%	2.0%	1.7%	1.5%	1.7%
Massachusetts	2.0%	2.5%	1.9%	1.7%	1.5%	1.7%
New England	1.5%	1.8%	1.9%	1.7%	1.5%	1.7%
Total U.S.	1.8%	2.4%	2.3%	2.1%	1.8%	2.1%
Personal Per Capita Income						
Boston Service Area	$54,001	$55,721	$61,328	$65,657	$69,588	$73,092
Massachusetts	$51,922	$53,893	$59,325	$63,577	$67,459	$70,905
New England	$50,670	$52,513	$56,441	$60,433	$64,049	$67,213
Total U.S.	$41,010	$41,728	$45,335	$48,500	$51,342	$53,753
Boston Service Area Population as a Percent of:						
% of Massachusetts	104.0%	103.4%	103.4%	103.3%	103.2%	103.1%
% of New England	106.6%	106.1%	108.7%	108.6%	108.6%	108.7%
% of U.S. Total	131.7%	133.5%	135.3%	135.4%	135.5%	136.0%
	10 Years	**5 Years**	**5 Years**	**5 Years**	**5 Years**	**15 Years**
Average Annual Growth	**'07-'17**	**'12-'17**	**'17-'22**	**'22-'27**	**'27-'32**	**'17-'32**
Boston Service Area	1.3%	1.9%	1.4%	1.2%	1.0%	1.2%
Massachusetts	1.3%	1.9%	1.4%	1.2%	1.0%	1.2%
New England	1.1%	1.5%	1.4%	1.2%	1.0%	1.2%
Total U.S.	1.0%	1.7%	1.4%	1.1%	0.9%	1.1%

Note: The Boston Service Area includes Bristol, Essex, Middlesex, Norfolk, Plymouth, Suffolk, and Worcester counties; Figures in 2009 dollars; Numbers for 2017 are estimates.
Source: Woods & Poole Economics, 2018.

4. BOSTON LOGAN INTERNATIONAL AIRPORT TRAFFIC AND SERVICE CHARACTERISTICS

4.1 Introduction

Boston Logan International Airport is the busiest commercial airport in New England serving a record 40.9 million commercial airline passengers[60] in CY 2018. Logan is the principal airport for the greater Boston metropolitan area[61] and the international and long-haul gateway for much of New England. In recent years, Logan's passenger traffic has grown to new record levels. The Airport is one of the leading U.S. airports in terms of airline and air passenger growth, and continues to be a highly desirable market for air carriers.

The economic growth in the regional New England economy has fueled significant growth in travel demand. Airlines have met this demand: through increases in LCC service, renewed FSC service, and growth in international service at the Airport. JetBlue is the market leader at Logan and currently Logan is the carrier's second largest focus city, after New York-JFK. Delta has made Boston a focus of network growth and has moved into the second largest position at the Airport, in terms of seats and frequencies. LCCs have evolved into a very important market segment for the Airport, lowering yields and fueling passenger growth to leisure markets. Additionally, over the last five years, Logan has been one of the fastest growing large hub U.S. airports in terms of international passengers and new international routes.

Over the past decade, Logan has seen a trend in increasing aircraft size and passenger load factors. As of CY 2018, passenger traffic[62] at Logan was 56 percent higher than in 2008, while commercial airline operations at the Airport declined by 13 percent. This difference was caused by a shift in aircraft fleet mix at Logan, with many of the small regional jet (RJ)[63] aircraft (with 30 to 50 seats) being replaced with larger RJs and turbo-propeller aircraft ("turboprop") (with 70 to 90 seats).

16th
Busiest U.S. Airport

Airlines have also placed increasing emphasis on capacity management, putting efforts into better matching capacity to demand and filling planes more effectively. Similar to other U.S. airports, airline load factors have increased to record levels at Logan. The change in aircraft fleet mix and increase in load factors has had a dramatic effect on the average number of passengers per operation at the Airport, which climbed from 61 in CY 2000 to 104 in CY 2018.

New aircraft technology has opened new route opportunities for Logan Airport. Many of the new routes introduced to Logan in recent years are international and are flown by smaller long-haul widebody planes like the Boeing B787 and Airbus A350. As of June 1, 2019, Logan offered nonstop service to 56 international destinations (including seasonal activity).[64] ICF expects new markets will continue to become economically viable with the introduction of additional new technology aircraft over the next five years.

This section reviews recent and long-term trends in passenger traffic, airline service, aircraft activity, air cargo and general aviation at Logan. A comparison of Logan's performance to that of other large U.S. airports is also presented.

4.2 Logan Airport Service Area

Logan Airport fulfills a number of roles in the local, New England, and national air transportation networks:

1. Logan is the primary airport serving the Boston metropolitan area and is the principal New England airport for long-haul service;
2. Logan is a major U.S. international gateway airport for transatlantic service;

[60] Includes GA passengers.
[61] Boston metropolitan area includes the following seven counties: Bristol, Essex, Middlesex, Norfolk, Plymouth, Suffolk, and Worcester Counties.
[62] Excludes GA passengers.
[63] Regional jets ("RJs") are small jet powered aircraft with 90 or fewer seats. RJs operate at higher speeds and can fly longer stage lengths than turboprops. The operating range for a typical RJ is 800 to 1,000 miles, compared to 400 miles for a turboprop. The distinction between RJs and jets is blurring as larger regional jet models with up to 100 seats have been introduced. In this report, RJs over 90 seats are included in the large jet category.
[64] Massport schedule report.

3. Logan serves as a regional connecting hub for small northern New England markets and the Massachusetts maritime counties of Barnstable, Dukes, and Nantucket; and

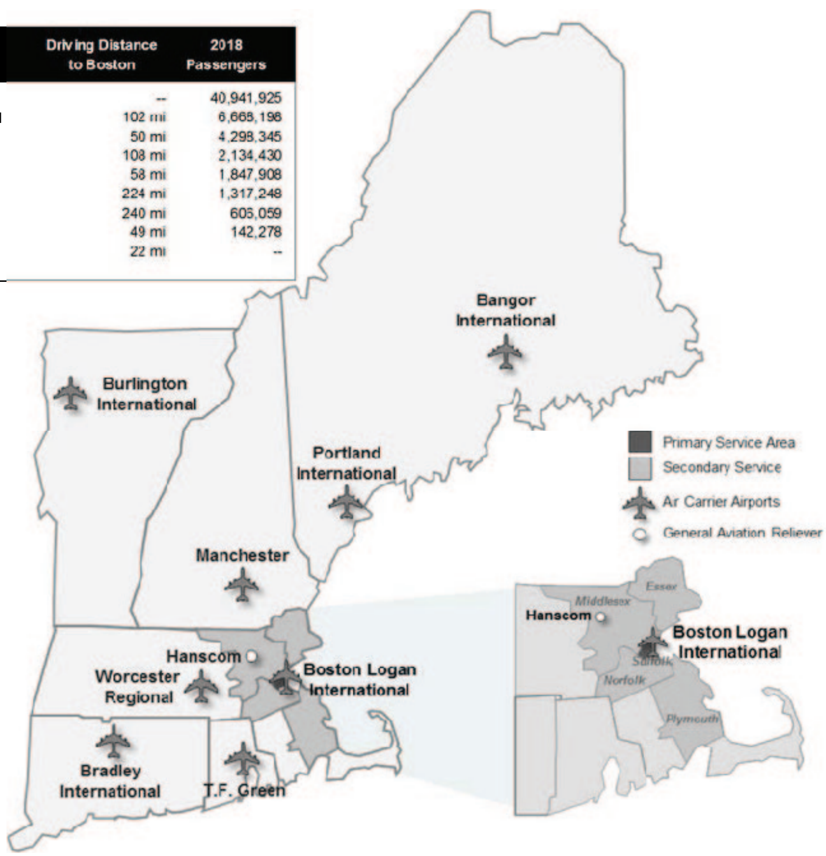
4. Logan is the busiest air cargo center in New England.

An airport's service area refers to the local geographic region from which it draws passengers. The quality of service at an airport, as well as the proximity, accessibility, and service offerings of other airports in the region, generally determine airport service area boundaries. The "core" or primary service area generates the majority of an airport's passengers. The secondary service area extends outward from the core and may overlap with the service areas of other airports.

The primary service area for Logan Airport consists of Suffolk, Middlesex, Norfolk, Essex, and Plymouth counties in Massachusetts, referred to as the "Logan Airport Service Area" (Exhibit 4-1). Logan is the principal commercial airport serving this region. While Hanscom Field (also owned and operated by Massport) is located within Logan's primary service area, it currently has no scheduled commercial operations and serves as a general aviation reliever airport to Logan.

Exhibit 4-1: Boston Logan Airport, Primary and Secondary Service Areas

Airport	Driving Distance to Boston	2018 Passengers
Boston Logan	--	40,941,925
Bradley International	102 mi	6,668,198
T.F. Green	50 mi	4,298,345
Portland	108 mi	2,134,430
Manchester-Boston	58 mi	1,847,908
Burlington	224 mi	1,317,248
Bangor	240 mi	605,059
Worcester	49 mi	142,278
Hanscom	22 mi	--



Note: Worcester and Hanscom airports are owned by the Authority.
Sources: Massport, U.S. DOT, T-100 Database via Airline Data, Inc., and airport records.

The Airport's secondary service area encompasses the rest of Massachusetts and the other New England states. Smaller regional commercial service airports, such as T.F. Green in Warwick, Rhode Island and Manchester-Boston in Manchester, New Hampshire, are located nearby in the secondary service area and have some overlap with and may draw some of their passengers from Logan's primary service area. However, this trend has waned in recent years as LCC services have expanded at Logan and airlines have withdrawn many services from the secondary airports.

Other commercial service airports in the Airport's secondary service area are Worcester Regional Airport in Worcester, Massachusetts, which is also owned by Massport;[65] Portland International Jetport in Portland, Maine; Bangor International Airport in Bangor, Maine; Bradley International Airport in Hartford, Connecticut; and Burlington International Airport in Burlington, Vermont.

4.3 Airport Passengers

In CY 2018, Logan Airport served a record 40.9 million total passengers, including general aviation. Compared to CY 2017, total passengers at the Airport saw an increase of 6.6 percent. A history of Logan's passenger traffic is presented in Exhibit 4-2.

Passenger traffic at the Airport fully recovered from the 2008-2009 global economic downturn, returning to pre-recession levels in 2011 and reaching new records in each subsequent year. Factors contributing to traffic recovery and growth at Logan include the continued expansion of Delta and JetBlue, the entry of other LCCs such as Southwest, sharp service reductions at secondary airports in the region (Manchester-Boston), and new international air service. Despite the numerous external shocks and challenges, from 2000 to 2018, Logan's passenger traffic grew by an average 2.2 percent per year, which was substantially faster than the total U.S. traffic growth of 1.5 percent.[66] Logan has the third highest O&D share for domestic traffic among U.S. large hub airports, with O&D passengers representing 94.2 percent[67] of domestic passengers using the Airport. Total (domestic and international) O&D traffic accounted for approximately 93.1 percent[68] of total passengers at the Airport in CY 2018.

Since connecting passengers represent less than 10 percent of Logan's total passenger traffic, the Airport is not reliant on this segment and therefore is not subject to large traffic fluctuations due to hub carrier strategy changes in the same manner as at connecting hub airports.

[65] On July 1, 2010, in accordance with the Commonwealth's Transportation Reform Act, Massport assumed ownership of the Worcester Regional Airport from the City of Worcester. In November 2013, JetBlue commenced daily nonstop services from Worcester to Orlando and Ft. Lauderdale, which it still serves as of July 2019. American began service to Chicago O'Hare in October 2018. Delta will begin to serve Detroit from Worcester in August 2019.
[66] Bureau of Transportation Statistics.
[67] U.S. DOT O&D Survey via Airline Data, Inc., CY 2018.
[68] IATA PaxIS, CY 2018.

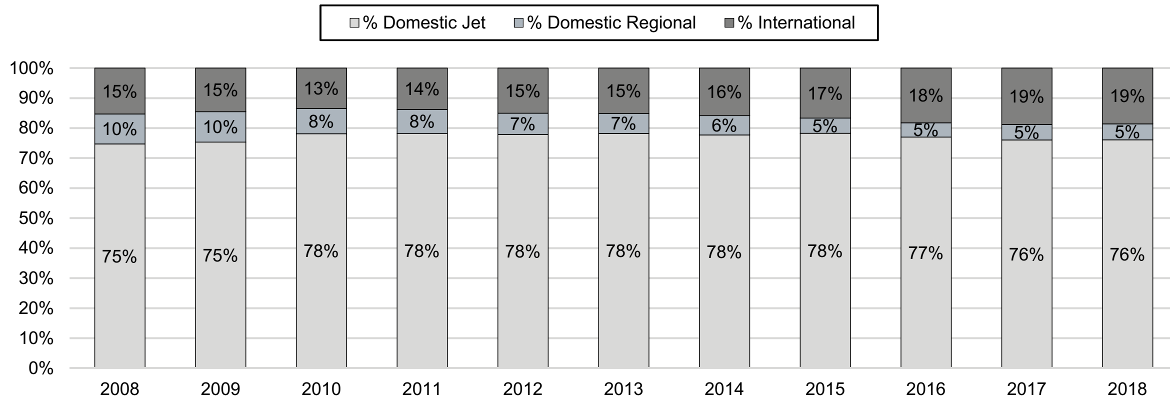
Exhibit 4-2: Historical Passenger Traffic at Logan Airport (CY 1970 to CY 2018)

	BOS Passengers (000s)[1]			General	Logan	U.S. Passengers (000s)[2]		
Year	Domestic	Intl.	Total	Aviation	Total	Domestic	Intl.	Total
1970	8,476	916	9,393	n/a	9,393	153,662	16,260	169,922
1980	12,564	2,159	14,722	n/a	14,722	247,069	49,831	296,901
1990	19,455	3,359	22,814	n/a	22,814	423,566	41,992	465,558
2000	23,101	4,513	27,614	113	27,727	599,851	74,399	674,250
2005	22,729	4,237	26,966	122	27,088	657,261	81,367	738,628
2006	23,556	4,050	27,606	119	27,725	658,363	86,358	744,721
2007	23,838	4,153	27,991	111	28,102	679,168	90,454	769,622
2008	22,032	3,977	26,010	93	26,103	651,709	91,603	743,312
2009	21,767	3,696	25,463	49	25,512	618,051	85,848	703,899
2010	23,688	3,682	27,370	59	27,429	629,538	90,959	720,497
2011	24,831	3,962	28,794	114	28,908	638,247	92,549	730,796
2012	24,743	4,384	29,127	109	29,236	642,289	94,410	736,699
2013	25,578	4,546	30,124	95	30,219	645,616	97,489	743,105
2014	26,546	4,992	31,538	96	31,634	662,826	99,879	762,705
2015	27,810	5,534	33,344	105	33,450	696,027	102,203	798,230
2016	29,591	6,587	36,179	110	36,288	719,000	103,900	822,900
2017	31,101	7,200	38,301	112	38,412	741,700	107,700	849,400
2018	33,246	7,584	40,830	112	40,942	777,900	111,100	889,000
Average Annual Growth								
1970-1980	4.0%	8.9%	4.6%	-	4.6%	4.9%	11.9%	5.7%
1980-1990	4.5%	4.5%	4.5%	-	4.5%	5.5%	-1.7%	4.6%
1990-2000	1.7%	3.0%	1.9%	-	2.0%	3.5%	5.9%	3.8%
2000-2013	0.8%	0.1%	0.7%	-1.3%	0.7%	0.6%	2.1%	0.8%
2013-2018	5.4%	10.8%	6.3%	3.4%	6.3%	3.8%	2.6%	3.7%
2000-2018	2.0%	2.9%	2.2%	0.0%	2.2%	1.5%	2.3%	1.5%
Percent Change Over Prior Year								
2011	4.8%	7.6%	5.2%	94.7%	5.4%	1.4%	1.7%	1.4%
2012	-0.4%	10.6%	1.2%	-4.6%	1.1%	0.6%	2.0%	0.8%
2013	3.4%	3.7%	3.4%	-13.1%	3.4%	0.5%	3.3%	0.9%
2014	3.8%	9.8%	4.7%	1.4%	4.7%	2.7%	2.5%	2.6%
2015	4.8%	10.9%	5.7%	9.3%	5.7%	5.0%	2.3%	4.7%
2016	6.4%	19.0%	8.5%	4.2%	8.5%	3.3%	1.7%	3.1%
2017	5.1%	9.3%	5.9%	2.2%	5.9%	3.2%	3.7%	3.2%
2018	6.9%	5.3%	6.6%	0.3%	6.6%	4.9%	3.2%	4.7%

[1] Includes commercial airline passengers. General aviation passengers include passengers flying on private, corporate, and on-demand air taxi flights. Domestic includes regional passengers.
[2] Total U.S. enplanements; Excludes GA passengers.
Source: Massport and BTS.

As shown in Exhibit 4-3 below, the traffic mix at the Airport is strongly domestic, with 81 percent of the Airport's total passengers in 2018 consisting of domestic and regional passengers. However, the Airport has seen a rapid growth in international passengers in recent years. Over the past five years, international passengers have grown at an average annual growth rate of 10.8 percent. This compares to overall U.S. international passenger growth of 2.6 percent per year over the same period. The international segment represented 18.5 percent of total passengers at Logan in 2018. Historical growth trends in each of these segments are discussed in the following sections.

Exhibit 4-3: Logan Domestic and International Share of Commercial Passenger Traffic (CY 2008 to CY 2018)



Note: Excludes general aviation passengers.
Source: Massport.

Compared to preliminary 2018 ACI statistics, Logan Airport is among the top U.S. airports in terms of total passengers, ranking as the 16th busiest U.S. airport in CY 2018 (Exhibit 4-4). Logan is also one of the fastest growing FAA large hubs. In CY 2018, passenger traffic at Logan increased by 6.6 percent over the prior year, substantially faster than the large hub average growth of 4.0 percent. Annual passenger growth at Logan since 2013 has averaged 6.3 percent, ranking 5th among U.S. large hub airports, and outperforming most of its peer group airports (Exhibit 4-5). A significant portion of the growth at the Airport, both on a year-over-year basis and on a 5-year basis, came from the expansion of international service.

5th
Fastest Growing Large Hub U.S. Airport

Exhibit 4-4: Ranking of U.S. Large Hub Airports Based on Total Passengers (CY 2018)[69]

Rank	Airport	Passengers (millions)	% Change from 2017	Rank	Airport	Passengers (millions)	% Change from 2017
1	Atlanta - ATL	107.3	3.3%	**16**	**Boston - BOS**	**40.9**	**6.6%**
2	Los Angeles - LAX	87.5	3.5%	17	Minneapolis - MSP	37.9	-0.3%
3	Chicago - ORD	83.3	4.4%	18	Fort Lauderdale - FLL	36.0	10.6%
4	Dallas/Fort Worth - DFW	69.1	3.0%	19	Detroit - DTW	35.2	1.5%
5	Denver - DEN	64.5	5.1%	20	Philadelphia - PHL	31.7	7.1%
6	New York - JFK	61.6	3.8%	21	New York - LGA	30.0	1.4%
7	San Francisco - SFO	57.7	3.4%	22	Baltimore - BWI	27.1	2.9%
8	Seattle/Tacoma - SEA	49.8	6.2%	23	Salt Lake City - SLC	25.6	5.6%
9	Las Vegas - LAS	49.8	2.6%	24	San Diego - SAN	24.2	9.2%
10	Orlando - MCO	47.7	6.9%	25	Washington - IAD	23.9	5.2%
11	Charlotte - CLT	46.4	1.2%	26	Washington - DCA	23.4	-1.8%
12	New York - EWR	46.1	6.5%	27	Chicago - MDW	22.0	-1.9%
13	Miami - MIA	45.0	2.2%	28	Tampa - TPA	21.3	8.5%
14	Phoenix - PHX	44.9	2.3%	29	Portland - PDX	19.9	4.2%
15	Houston - IAH	43.7	7.3%				
	Total Large Hubs	**1,303.9**	**4.0%**				

Note: Includes only airports in the continental United States.
Sources: Airports Council International ("ACI") North America Preliminary Traffic Report, 2018 statistics.

[69] Only large hub airports within the continental United States are shown.

Exhibit 4-5: Fastest Growing U.S. Large Hub Airports
(CY 2018)

Rank	Airport	Passengers (millions) 2013	Passengers (millions) 2018	Avg Annual Growth	Rank	Airport	Passengers (millions) 2013	Passengers (millions) 2018	Avg Annual Growth
1	Fort Lauderdale - FLL	23.6	36.0	8.8%	16	Baltimore - BWI	22.5	27.1	3.8%
2	Seattle/Tacoma - SEA	34.8	49.8	7.4%	17	Washington - DCA	20.4	23.4	2.8%
3	Orlando - MCO	34.8	47.7	6.5%	18	Dallas/Fort Worth - DFW	60.5	69.1	2.7%
4	San Diego - SAN	17.7	24.2	6.5%	19	Atlanta - ATL	94.4	107.3	2.6%
5	**Boston - BOS**	**30.2**	**40.9**	**6.3%**	20	New York - LGA	26.7	30.0	2.3%
6	Portland - PDX	15.0	19.9	5.8%	21	Minneapolis - MSP	33.9	37.9	2.3%
7	New York - EWR	35.0	46.1	5.6%	22	Phoenix - PHX	40.3	44.9	2.2%
8	Los Angeles - LAX	66.7	87.5	5.6%	23	Miami - MIA	40.6	45.0	2.1%
9	San Francisco - SFO	44.9	57.7	5.1%	24	Houston - IAH	39.8	43.7	1.9%
10	Salt Lake City - SLC	20.2	25.6	4.8%	25	Washington - IAD	21.8	23.9	1.9%
11	Tampa - TPA	16.9	21.3	4.7%	26	Detroit - DTW	32.4	35.2	1.7%
12	Chicago - ORD	66.8	83.3	4.5%	27	Chicago - MDW	20.4	22.0	1.6%
13	Denver - DEN	52.6	64.5	4.2%	28	Charlotte - CLT	43.5	46.4	1.3%
14	New York - JFK	50.4	61.6	4.1%	29	Philadelphia - PHL	30.5	31.7	0.8%
15	Las Vegas - LAS	40.9	49.8	4.0%					
	Total Large Hubs	**1,078.2**	**1,303.9**	**3.9%**					

Note: Includes only airports in the continental United States.
Sources: ACI Preliminary Traffic Report, 2018 statistics.

Logan is a highly competitive market where multiple carriers compete actively for passenger traffic share. In 2018, JetBlue carried approximately 11.6 million passengers, maintaining a market share of close to 28 percent at Logan. Delta follows behind JetBlue, ranking second with 7.0 million passengers, or 17.1 percent of the total. American Airlines is the third largest carrier at Logan, carrying 6.7 million passengers in 2018, or 16.4 percent of total passengers at Logan. Following its merger with US Airways in December 2013, American continued to rationalize operations and decrease seat capacity through July 2017, with a corresponding lower market share. United ranked fourth with 10.0 percent passenger market share, followed by Southwest with 7.1 percent market share. Southwest has reduced its seat capacity slightly in Boston during this past calendar year having reduced frequencies on routes that compete with Delta and JetBlue. In 2018, the top five carriers at Logan accounted for approximately 78.8 percent of the Airport's passenger traffic, which is unchanged from the prior year, with JetBlue and Delta adding seats faster than the average. The breakdown of passenger market share by airline at Logan is presented in Exhibit 4-6.

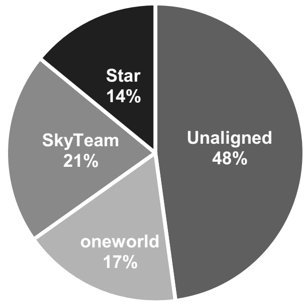
Exhibit 4-6: Airline Share of Total Logan Passengers (Domestic and International)
(CY 2013, CY 2017, and CY 2018)

Airline [1]	CY 2013 Rank	CY 2013 Passengers	CY 2013 Share	CY 2017 Rank	CY 2017 Passengers	CY 2017 Share	CY 2018 Rank	CY 2018 Passengers	CY 2018 Share
JetBlue	1	8,102,281	26.8%	1	10,520,214	27.4%	1	11,550,238	28.2%
Delta	3	4,252,442	14.1%	3	6,065,111	15.8%	2	7,006,463	17.1%
American	2	6,851,899	22.7%	2	6,595,375	17.2%	3	6,706,486	16.4%
United	4	3,696,717	12.2%	4	3,976,095	10.4%	4	4,092,700	10.0%
Southwest	5	2,523,714	8.4%	5	3,057,748	8.0%	5	2,924,396	7.1%
Subtotal		**25,427,053**	**84.1%**		**30,214,543**	**78.7%**		**32,280,283**	**78.8%**
All Other Carriers		4,791,578	15.9%		8,197,876	21.3%		8,661,642	21.2%
Total Airport		**30,218,631**	**100.0%**		**38,412,419**	**100.0%**		**40,941,925**	**100.0%**

[1] Includes passengers on regional airline affiliates.
Note: Leading carriers at Logan saw a slight decline in market share due to growth by other carriers.
Source: Massport.

Unlike other airports that predominantly cater to flights by a single carrier or a single airline alliance, Logan's service is less concentrated. As of July 2019, 48 percent of scheduled weekly departing seats at Logan are on carriers that are unaligned with one of the three majors, while 52 percent is split among oneworld, SkyTeam, and Star Alliance (Exhibit 4-7).

Exhibit 4-7: Share of Weekly Departing Seats at Logan (July 2019)

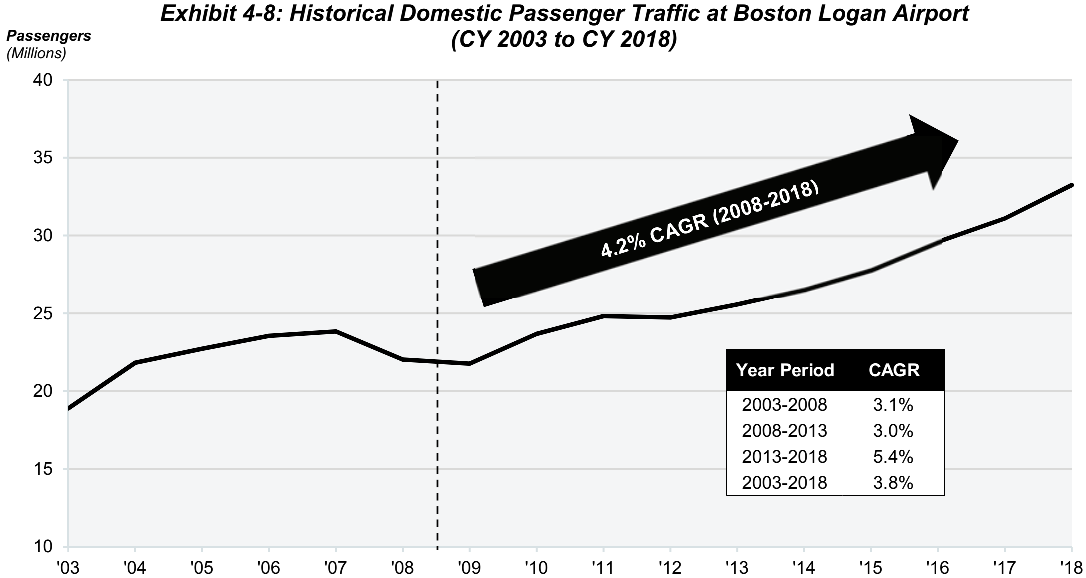


Source: Innovata Schedules.

4.3.1 Domestic Passengers

Logan's domestic passenger traffic reached a new peak of 33.2 million[70] in CY 2018 (see Exhibit 4-8), recording its sixth consecutive year of positive annual growth. Rising fuel costs and the economic recession caused Logan's passengers to decline from 2007 to 2009. Domestic passenger traffic began to recover in 2010, largely as a result of the expansion of LCC service at Logan. JetBlue's market entry in 2004 and subsequent aggressive expansion at the Airport has led to sustained growth in the domestic passenger market segment. Between 2013 and 2018, domestic passenger traffic at Logan grew by an average annual rate of 5.4 percent, significantly faster than overall domestic passenger traffic in the U.S., which increased by 3.8 percent[71] per year over the same period. Over the past decade, in terms of year-over-year growth, 2018 at Logan saw the largest annual growth in domestic passengers of 6.9 percent.

Exhibit 4-8: Historical Domestic Passenger Traffic at Boston Logan Airport (CY 2003 to CY 2018)



Year Period	CAGR
2003-2008	3.1%
2008-2013	3.0%
2013-2018	5.4%
2003-2018	3.8%

Note: Excludes general aviation passengers.
Source: Massport.

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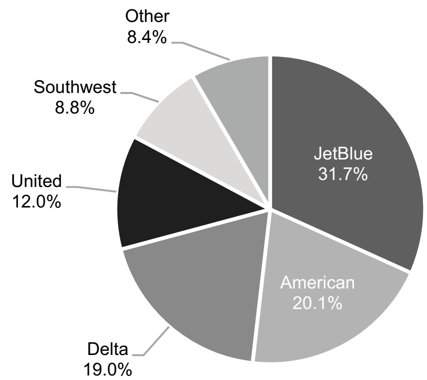
70 Includes Domestic regional passengers, excludes GA.
71 U.S. DOT, Bureau of Transportation Statistics; includes scheduled traffic only.

JetBlue was the leading domestic carrier at Logan in CY 2018 with a 31.7 percent share (see Exhibit 4-9). American was second with a 20.1 percent market share. Delta was the third largest domestic carrier at Logan with 19.0 percent of domestic passengers, followed by United with 12.0 percent and Southwest with 8.8 percent.

Exhibit 4-9: Airline Market Share of Logan Domestic Passengers (CY 2018)

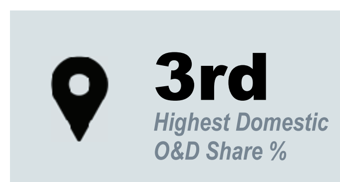


Note: Regional airline passengers are grouped with their mainline carrier partners; Excludes general aviation passengers.
Source: Massport.

4.3.2 Strength of the Boston Domestic Market

The strength of the Boston domestic passenger market derives from:

(1) the strong Origin and Destination (O&D) nature of the market,
(2) the lack of a dominant carrier and the relative balance between carriers,
(3) the large pool of competitive domestic fares generated along with increased airline revenue,
(4) the large share of premium traffic generated, and
(5) the breadth of service offerings (FSC and LCC)



Logan Airport is principally an O&D airport, meaning that the majority of passengers originate from or travel to the Boston Service Area. Because of Logan's geographic location on the Northeast U.S. coast, no major airline has established domestic connecting hub operations at the Airport. More than nine out of ten (94.2 percent[72]) domestic passengers using Logan are O&D passengers. This is the third highest O&D share among U.S. large hub airports (see Exhibit 4-10) and is a distinguishing characteristic of Logan that has remained stable over time. Since connecting passengers represent only a small percentage of Logan's passenger traffic, long-term passenger growth at the Airport is primarily a function of underlying market demand. Unlike major connecting hub airports, Logan is not reliant on connecting passengers and therefore is not subject to large traffic fluctuations that may result from changes in a hubbing carrier's network strategy.

[72] For CY 2018 period – domestic traffic.

Exhibit 4-10: Domestic Local and Connecting Passenger Shares for Top U.S. Large Hub Airports (CY 2018)

% Local Rank	Apt Code	Market	% of Domestic Psgrs O&D	% of Domestic Psgrs Connecting	% Local Rank	Apt Code	Market	% of Domestic Psgrs O&D	% of Domestic Psgrs Connecting
1	TPA	Tampa	95.4%	4.6%	16	PHL	Philadelphia	70.6%	29.4%
2	MCO	Orlando	94.4%	5.6%	17	PHX	Phoenix	66.9%	33.1%
3	**BOS**	**Boston**	**94.2%**	**5.8%**	18	MIA	Miami	66.0%	34.0%
4	SAN	San Diego	94.1%	5.9%	19	DEN	Denver	64.0%	36.0%
5	LGA	New York	91.7%	8.3%	20	MDW	Chicago	63.7%	36.3%
6	DCA	Washington	88.2%	11.8%	21	IAD	Washington	62.0%	38.0%
7	PDX	Portland	87.7%	12.3%	22	SLC	Salt Lake City	61.5%	38.5%
8	FLL	Fort Lauderdale	86.6%	13.4%	23	MSP	Minneapolis	61.5%	38.5%
9	LAS	Las Vegas	85.3%	14.7%	24	DTW	Detroit	60.3%	39.7%
10	JFK	New York	80.9%	19.1%	25	ORD	Chicago	56.2%	43.8%
11	EWR	New York	80.8%	19.2%	26	IAH	Houston	52.2%	47.8%
12	LAX	Los Angeles	80.3%	19.7%	27	DFW	Dallas/Fort Worth	47.2%	52.8%
13	SFO	San Francisco	77.9%	22.1%	28	ATL	Atlanta	39.1%	60.9%
14	BWI	Baltimore	71.3%	28.7%	29	CLT	Charlotte	31.1%	68.9%
15	SEA	Seattle/Tacoma	71.1%	28.9%					
	Average Large Hubs		**68.2%**	**31.8%**					

Note: Includes only airports in the continental United States.
Source: U.S. DOT O&D Survey via Airline Data, Inc.; ICF Analysis.

In terms of domestic O&D passenger volumes, the Boston market has grown on par with the average rate of the top 20 largest U.S. markets. In CY 2018, Logan Airport served 29.3 million domestic O&D passengers, making Boston the 11th largest domestic O&D market in the United States, growing at an average annual rate of 5.6 percent from CY 2013 to CY 2018. As shown in Exhibit 4-11, Boston ranked 10th in terms of O&D average annual growth among the top 20 domestic O&D markets, making it one of the fastest growing large U.S. east coast markets behind Atlanta and Orlando. On average, domestic O&D growth at the overall top 20 U.S. markets increased 5.7 percent annually from CY 2013 to CY 2018.

Exhibit 4-11: Comparison of Domestic O&D Passenger Growth in Largest U.S. Markets (CY 2013 to CY 2018)

Avg. Annual Change Rank	Market	Domestic O&D Passengers CY 2013	Domestic O&D Passengers CY 2018	Avg. Annual Change (2013-2018)	Avg. Annual Change Rank	Market	Domestic O&D Passengers CY 2013	Domestic O&D Passengers CY 2018	Avg. Annual Change (2013-2018)
1	Seattle/Tacoma	21.1	29.5	7.0%	11	Fort Lauderdale	17.4	22.8	5.5%
2	Atlanta	24.9	34.7	6.9%	12	Phoenix	21.7	28.2	5.4%
3	Denver	26.6	37.1	6.9%	13	Chicago	38.4	49.1	5.1%
4	Los Angeles	33.3	46.4	6.8%	14	Tampa	14.0	18.0	5.1%
5	San Diego	15.2	21.1	6.8%	15	New York	56.1	71.8	5.1%
6	Orlando	26.4	36.2	6.5%	16	San Francisco	24.8	31.2	4.7%
7	Dallas/Fort Worth	26.7	36.4	6.4%	17	Houston	19.5	24.5	4.7%
8	Detroit	13.2	18.0	6.4%	18	Washington	22.2	27.8	4.5%
9	Minneapolis	15.0	20.0	5.9%	19	Las Vegas	29.0	35.9	4.4%
10	**Boston**	**22.3**	**29.3**	**5.6%**	20	Philadelphia	14.9	18.3	4.2%
	Total Top 20	**482.8**	**636.4**	**5.7%**					

Note: Passenger numbers are in millions. Top 20 markets based on YE 4Q 2018 domestic O&D passengers. New York includes JFK, LaGuardia, and Newark airports. Washington includes Reagan National and Dulles airports. Houston includes Hobby and George Bush Intercontinental airports. Dallas includes Love Field and Dallas/Ft. Worth airports. Chicago includes Midway and O'Hare airports. Includes only airports in the continental United States.

Source: U.S. DOT, O&D Survey, via Airline Data, Inc.

Over the past five years, the average domestic airline yield at Logan and a majority of other U.S. Large Hub airports has declined as airlines have competed with highly competitive market fares and marketing strategies. As shown in Exhibit 4-12, Logan experienced a 1.5 percent average annual decline between CY 2013 and CY 2018, consistent with the average annual decline of 1.2 percent for all U.S. Large Hubs. Domestic passenger revenues at the Airport totaled $4.9 billion for CY 2018. Logan Airport ranks 19th in terms of average annual growth in domestic yields (Exhibit 4-12) and 8th in airline revenue generation (Exhibit 4-13) due to its longer average stage length. Yield levels are often tied to an airline's dominance of service at a particular airport, and if large hub U.S. airports with a single carrier providing greater than 40 percent of departing domestic seat share were excluded from Exhibit 4-12, only Los Angeles and Tampa airports would remain ranked higher than Logan. Compared to other airports that have a diverse array of domestic air carrier service, Boston's 1.5 percent average annual decline is relatively in line with other Large Hub airports.

Exhibit 4-12: Comparison of Average Domestic Yield Trends at U.S. Large Hubs (CY 2013 to CY 2018)

Avg. Annual Change Rank	Airport	Avg. Stage Length (miles)	Domestic Yield CY 2013	Domestic Yield CY 2018	Avg. Annual Change 2013-2018	Avg. Annual Change Rank	Airport	Avg. Stage Length (miles)	Domestic Yield CY 2013	Domestic Yield CY 2018	Avg. Annual Change 2013-2018
1	Charlotte - CLT	891	20.6¢	22.8¢	2.0%	16	Los Angeles - LAX	1,566	12.4¢	11.6¢	-1.3%
2	Washington - IAD	1,389	15.0¢	15.2¢	0.3%	17	Tampa - TPA	1,104	14.1¢	13.2¢	-1.3%
3	Phoenix - PHX	1,204	13.8¢	13.9¢	0.2%	18	Denver - DEN	1,060	14.6¢	13.5¢	-1.5%
4	Washington - DCA	977	18.4¢	18.5¢	0.1%	**19**	**Boston - BOS**	**1,305**	**13.9¢**	**12.8¢**	**-1.5%**
5	San Francisco - SFO	1,570	12.7¢	12.7¢	-0.1%	20	Chicago - MDW	937	15.8¢	14.6¢	-1.6%
6	New York - JFK	1,653	12.7¢	12.6¢	-0.2%	21	Atlanta - ATL	897	19.8¢	18.1¢	-1.7%
7	Philadelphia - PHL	1,190	15.7¢	15.6¢	-0.2%	22	Chicago - ORD	1,022	18.1¢	16.5¢	-1.9%
8	Dallas/Fort Worth - DFW	1,052	18.0¢	17.5¢	-0.6%	23	Detroit - DTW	1,032	18.1¢	16.4¢	-2.0%
9	Seattle/Tacoma - SEA	1,455	12.3¢	11.8¢	-0.7%	24	Las Vegas - LAS	1,227	12.2¢	10.9¢	-2.2%
10	Portland - PDX	1,351	12.4¢	12.0¢	-0.7%	25	Fort Lauderdale - FLL	1,184	12.0¢	10.7¢	-2.3%
11	New York - LGA	950	18.0¢	17.2¢	-0.9%	26	Houston - IAH	1,128	19.6¢	17.4¢	-2.3%
12	Miami - MIA	1,267	14.8¢	14.0¢	-1.1%	27	Orlando - MCO	1,121	13.4¢	11.7¢	-2.7%
13	Salt Lake City - SLC	1,155	16.2¢	15.3¢	-1.2%	28	Minneapolis - MSP	1,095	18.5¢	16.0¢	-2.9%
14	New York - EWR	1,368	15.4¢	14.5¢	-1.2%	29	Baltimore - BWI	1,127	14.9¢	12.8¢	-3.0%
15	San Diego - SAN	1,353	12.7¢	12.0¢	-1.2%						
	Average Large Hub	**1,208**	**14.8¢**	**13.9¢**	**-1.2%**						

Note: Includes only airports in the continental United States; Yields do not include ancillary fees.
Source: U.S. DOT, O&D Survey via Airline Data, Inc.

Logan Airport represents a large and important domestic revenue market for the U.S. airlines. Based on enplanements, the Airport captures an oversized share of revenue. In CY 2018, Logan Airport was the 13th largest in terms of domestic enplanements but the 8th largest U.S. airport in terms of airline passenger fare revenues (Exhibit 4-13).

8th
Largest Domestic Airline Revenue Generator

Exhibit 4-13: Domestic Airline Revenue Generation for Large Hub U.S. Airports (CY 2018)

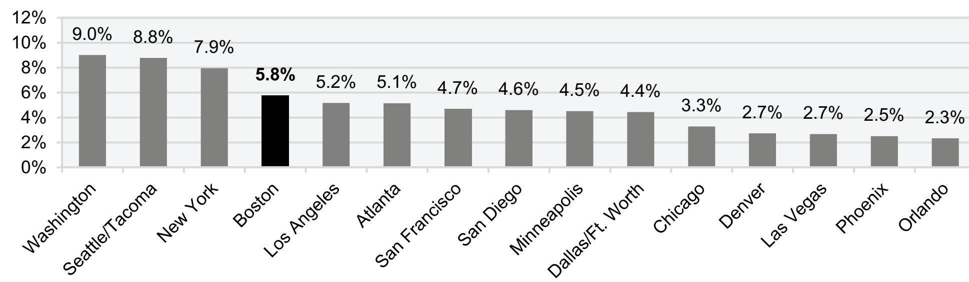
Rank Rev.	Rank Enpl.	Airport	Revenue ($ millions)	Rank Rev.	Rank Enpl.	Airport	Revenue ($ millions)
1	3	Los Angeles - LAX	$8,407	16	23	San Diego - SAN	$3,417
2	8	San Francisco - SFO	$6,212	17	20	Philadelphia - PHL	$3,393
3	2	Chicago - ORD	$6,040	18	24	Washington - DCA	$3,381
4	1	Atlanta - ATL	$5,652	19	14	Houston - IAH	$3,114
5	4	Denver - DEN	$5,314	20	16	Detroit - DTW	$3,051
6	7	Seattle/Tacoma - SEA	$5,078	21	19	Ft. Lauderdale - FLL	$2,904
7	15	New York - EWR	$4,938	22	27	Tampa - TPA	$2,617
8	**13**	**Boston - BOS**	**$4,917**	23	28	Portland - PDX	$2,523
9	6	Las Vegas - LAS	$4,818	24	21	Baltimore - BWI	$2,491
10	5	Dallas/Ft. Worth - DFW	$4,793	25	9	Charlotte - CLT	$2,490
11	11	Orlando - MCO	$4,725	26	22	Salt Lake City - SLC	$2,441
12	17	New York - JFK	$4,588	27	25	Miami - MIA	$2,363
13	10	Phoenix - PHX	$4,471	28	29	Washington - IAD	$1,910
14	18	New York - LGA	$4,059	29	26	Chicago - MDW	$1,779
15	12	Minneapolis - MSP	$3,509				

Note: Includes only airports in the continental United States. Excludes ancillary revenue. Enplanement rank is for domestic passengers.
Source: U.S. DOT, O&D Survey via Airline Data, Inc.

4th
Largest Market by Domestic Premium Revenue Share

Premium airline revenue[73] is most prominent among U.S. business markets that have regional jet/large jet service. Boston ranks 4th among the top U.S. markets with a large hub airport in terms of the percent of total revenues that is generated from domestic airline premium fare revenues (Exhibit 4-14). In CY 2018, Boston generated about $283.3 million in domestic premium class airline revenue, which equates to approximately 5.8 percent of its total domestic airline revenue (excluding ancillary fees). Logan ranks 8th among the U.S. large hub airports (seen in Exhibit 4-15) in terms of total domestic premium class revenue generated. The significance of the Boston premium segment to airlines is that, except for Los Angeles, all of the other high share markets are either airline hubs or slot constrained airports. Boston is one of the few markets where airlines can actively pursue premium revenue passengers and this is one of the reasons why airlines are attracted to serve the Airport.

Exhibit 4-14: Share of Premium Fare Revenues of Total Domestic Revenue at the Top 15 U.S. Large Hub Markets (CY 2018)



Note: Includes only airports in the continental United States. New York includes JFK, LaGuardia, and Newark airports. Washington includes Reagan National and Dulles airports. Chicago includes Midway and O'Hare airports.
Source: IATA PaxIS, YE Dec 2018., ICF Analysis.

Exhibit 4-15: Rank of U.S. Large Hub Airports by Domestic Premium Class Revenue (CY 2018)

Rank Rev.	Rank Enpl.	Airport	Premium Rev. ($ millions)	Rank Rev.	Rank Enpl.	Airport	Premium Rev. ($ millions)
1	17	New York - JFK	$512.0	16	14	Denver - DEN	$145.2
2	7	Seattle/Tacoma - SEA	$445.6	17	6	Portland - PDX	$141.0
3	3	Los Angeles - LAX	$434.0	18	28	Philadelphia - PHL	$131.0
4	24	Washington - DCA	$315.7	19	23	Las Vegas - LAS	$128.9
5	15	New York - EWR	$292.9	20	9	Miami - MIA	$128.1
6	8	San Francisco - SFO	$291.7	21	20	Houston - IAH	$122.1
7	1	Atlanta - ATL	$290.7	22	11	Salt Lake City - SLC	$118.6
8	**13**	**Boston - BOS**	**$283.3**	23	19	Phoenix - PHX	$111.7
9	2	Chicago - ORD	$257.1	24	25	Orlando - MCO	$110.0
10	18	New York - LGA	$254.3	25	10	Ft. Lauderdale - FLL	$90.4
11	5	Dallas/Ft. Worth - DFW	$212.3	26	21	Charlotte - CLT	$82.1
12	16	Detroit - DTW	$163.2	27	22	Tampa - TPA	$64.1
13	29	Washington - IAD	$160.2	28	27	Baltimore - BWI	$58.3
14	12	Minneapolis - MSP	$158.1	29	26	Chicago - MDW	$6.5
15	23	San Diego - SAN	$157.1				

Source: IATA PaxIS, YE Dec 2018, U.S. DOT, O&D Database via Airline Data, Inc., ICF Analysis.

[73] Based on IATA PaxIS, premium class revenue include: First Class, Business Class, and Premium Economy cabins; Economy includes "Discount Economy" and "Other Classes"

Because of the large O&D base, high O&D passenger ratio, strong revenue generation and strong premium class revenue, the Airport is located in a highly attractive market for airlines. Logan is also a highly competitive airport. Of all U.S. airports, Logan has the fourth lowest concentration of service flown by the top three carriers, highlighting the competitive nature of the Boston market (Exhibit 4-16). JetBlue is currently the leading domestic air service provider at Logan in terms of seat capacity, with 31.1 percent of the Airport's scheduled domestic seats (in July 2019). Delta, including its regional carrier affiliates, is second with a 21.4 percent share, and American Airlines is the third largest carrier, providing 17.5 percent of Logan's domestic seat capacity for the same month.

Given Logan's strong position as an O&D market, any future U.S. airline consolidation (through bankruptcies or mergers) is not anticipated to have a detrimental long-term effect on service levels as Logan's strong O&D demand, high yield business passengers, and positive growth outlook are expected to attract new services from incumbent carriers or new carriers seeking to capitalize on new opportunities. Historically, Airport passengers have grown from 14.7 million in 1980 to 24.4 million in 2001 and to 40.9 million in 2018. Over this 38-year period, many carriers have discontinued operations at the Airport (e.g., Eastern, TWA, Pan Am, New York Air, Braniff, and Peoples Express), yet passenger traffic has continued to grow as other airlines have replaced the lost services.

4th
Least Airline Concentration

Exhibit 4-16: Domestic Carrier Market Share at Logan and Other Large Hub Airports, Share of Scheduled Seats (July 2019)

Rank	Airport	Carrier Share of Nonstop Domestic Weekly Seats: Largest	2nd Largest	3rd Largest	All Other
1	Ft. Lauderdale - FLL	22.9%	22.5%	21.0%	33.6%
2	Los Angeles - LAX	23.6%	20.5%	18.2%	37.8%
3	Orlando - MCO	27.6%	13.7%	13.3%	45.3%
4	**Boston - BOS**	**31.1%**	**21.4%**	**17.5%**	**30.0%**
5	Tampa - TPA	37.3%	17.1%	16.0%	29.6%
6	Las Vegas - LAS	40.3%	12.8%	10.6%	36.3%
7	San Diego - SAN	41.7%	14.0%	13.3%	31.0%
8	Portland - PDX	42.7%	19.1%	14.7%	23.5%
9	Denver - DEN	43.0%	29.4%	13.2%	14.4%
10	New York - LGA	44.5%	27.8%	9.6%	18.0%
11	New York - JFK	44.9%	36.7%	12.6%	5.8%
12	Phoenix - PHX	45.8%	38.4%	6.7%	9.1%
13	Chicago - ORD	46.9%	39.6%	4.9%	8.6%
14	San Francisco - SFO	48.1%	15.8%	11.1%	24.9%
15	Washington - DCA	49.7%	16.8%	14.3%	19.3%
16	Seattle/Tacoma - SEA	50.4%	24.6%	7.3%	17.7%
17	New York - EWR	66.3%	7.0%	6.1%	20.6%
18	Baltimore - BWI	67.0%	11.4%	7.6%	14.0%
19	Philadelphia - PHL	67.3%	7.4%	6.8%	18.6%
20	Salt Lake City - SLC	70.8%	11.5%	5.2%	12.4%
21	Minneapolis - MSP	70.8%	6.9%	5.6%	16.7%
22	Detroit - DTW	72.7%	10.8%	5.8%	10.7%
23	Atlanta - ATL	77.8%	10.9%	3.8%	7.6%
24	Houston - IAH	78.2%	7.8%	7.2%	6.8%
25	Washington - IAD	78.6%	7.1%	5.1%	9.2%
26	Miami - MIA	82.5%	11.9%	4.2%	1.3%
27	Dallas/Ft. Worth - DFW	85.4%	5.2%	4.2%	5.2%
28	Charlotte - CLT	89.2%	3.9%	2.3%	4.5%
29	Chicago - MDW	96.4%	3.6%	0.0%	0.0%

Note: Ranked in ascending order by largest air carrier market share. Includes only airports in the continental United States. July 2019 is using advance schedules.
Source: Innovata Schedules.

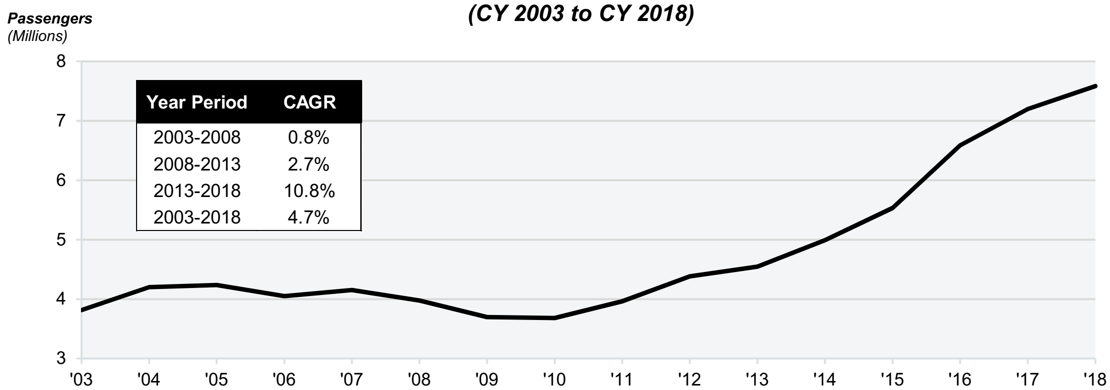
The changing airline market shares at Logan over time highlight the consistency of the Boston market. Since 1990, the leading carrier position at Logan Airport has changed various times among Delta, US Airways, American, and JetBlue. The continual shifting balance of service among top carriers at the Airport reflects the very active and competitive dynamics in the Boston market.

4.3.3 International Passengers

International passenger traffic at Logan has exhibited strong growth over the past decade, reaching a new peak of 7.6 million passengers in 2018 (see Exhibit 4-17). Over the most recent five years, international passengers at the Airport grew an average annual rate of 10.8 percent, and compared to all Large Hub U.S. Airports for the recent 12-months ending 3Q 2018, Logan is growing at the second fastest rate. This growth has been driven by the expansion of JetBlue and Delta international service at Boston, as well as a rapid increase in foreign carrier service in recent years. Since 2011, JetBlue has continued to expand its Caribbean network from Logan, while Delta has added nonstop service to London Heathrow, Paris-De Gaulle, and Dublin. Most recently in mid-2019, Delta added two European nonstop destinations, Edinburgh and Lisbon.

Logan has also attracted significant new foreign carrier service including Japan Airlines, Copa Airlines, Emirates, Turkish Airlines, Hainan Airlines, Norwegian Air Shuttle, SAS, TAP-Portugal, KLM, Korean Air, and Cathay Pacific.

Exhibit 4-17: Historical International Passenger Traffic at Boston Logan Airport (CY 2003 to CY 2018)

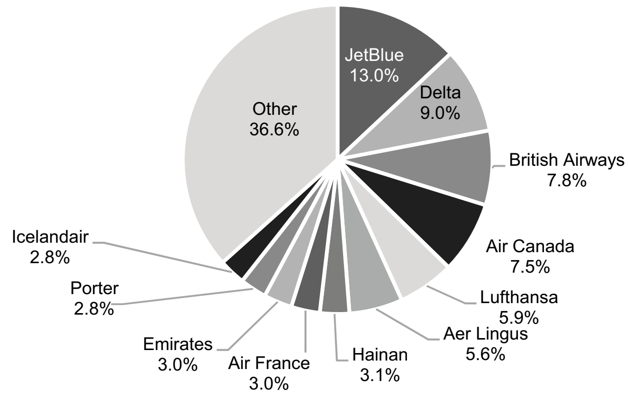


Note: Excludes general aviation passengers.
Source: Massport.

In CY 2018, in terms of international passengers, JetBlue was the leading international carrier, carrying 13.0 percent of Logan's international passengers (Exhibit 4-18). Delta, which offers service to six European and four Caribbean destinations,[74] was the second largest international carrier with a 9.0 percent share, followed by British Airways (7.8 percent), operating four daily flights to London-Heathrow. Foreign flag carriers have a majority share of the international passenger market at Logan, accounting for approximately 78 percent of the Airport's international passengers in CY 2018.

[74] Innovata schedules, July 2019.

Exhibit 4-18: Airline Market Share for International Passengers (CY 2018)



Note: Regional airline passengers are grouped with their mainline carrier partners. Excludes general aviation passengers.
Source: Massport.

Boston is currently the 11th largest U.S. gateway for international air travel, as shown in Exhibit 4-19 below. As the second fastest growing international gateway of all Large Hub U.S. Airports behind only Fort Lauderdale, Logan Airport is also one of the largest U.S. international gateway airports that is not also a U.S. airline connecting hub.

2nd
Fastest growing U.S. Gateway by International traffic

Exhibit 4-19: Top U.S. Gateways for International Traffic (CY 2013 to YE Nov 2018)

YE Nov 2018 Rank	U.S. Gateway	Hub	Total Passengers CY 2013	Total Passengers YE Nov 2018	YE Nov 2018 Pct. Share	CAGR '13-YE Nov 2018	Growth Rank
1	New York	✓	39,196,598	49,311,712	20.8%	4.8%	10
2	Los Angeles	✓	17,150,607	25,469,378	10.7%	8.4%	5
3	Miami	✓	20,308,509	21,009,506	8.9%	0.7%	13
4	Chicago	✓	11,344,020	14,355,747	6.1%	4.9%	9
5	San Francisco	✓	9,527,059	13,760,641	5.8%	7.8%	6
6	Atlanta	✓	9,937,190	12,257,702	5.2%	4.4%	11
7	Houston	✓	8,759,705	11,485,657	4.8%	5.7%	7
8	Fort Lauderdale		3,732,252	8,378,564	3.5%	17.9%	1
9	Dallas/Fort Worth	✓	6,472,651	8,358,968	3.5%	5.3%	8
10	Washington	✓	7,173,724	8,201,416	3.5%	2.8%	12
11	**Boston**		**4,545,799**	**7,583,887**	**3.2%**	**10.8%**	**2**
12	Orlando		3,993,379	6,356,189	2.7%	9.9%	3
13	Seattle/Tacoma	✓	3,422,340	5,308,065	2.2%	9.3%	4
14	Honolulu		4,835,991	4,704,004	2.0%	-0.6%	15
15	Philadelphia	✓	3,920,214	3,841,630	1.6%	-0.4%	14
	Sub Total: Top 15		**154,320,038**	**200,383,066**	**84.6%**	**5.7%**	
	Other		27,709,922	36,573,240	15.4%	6.0%	
	Grand Total		**182,029,960**	**236,956,306**	**100.0%**	**5.7%**	

Note: YE Nov 2018 is the latest quarterly international traffic data available from U.S. DOT T-100; Logan Airport references actual CY 2018 international traffic provided by the Authority.
Source: U.S. DOT, T-100 Database via Airline Data, Inc.; Massport.

Historically, the growth of international services has been heavily concentrated at major airline connecting hubs in the U.S. (e.g., Atlanta, Chicago O'Hare, Dallas/Ft. Worth, Houston Intercontinental, Miami, New York (JFK &

Newark), San Francisco, and Washington Dulles), as a hub carrier's connecting network was often needed to generate sufficient passenger traffic to fill the large widebody aircraft used on international flights. However, the local O&D strength of the Boston market makes Logan an attractive gateway for foreign flag airlines despite Logan's lack of a network carrier hub. In recent years, JetBlue has shown a willingness to develop interline and codeshare relationships with foreign airlines, increasing the connectivity potential at Logan. In addition, trends in new aircraft technology have also allowed for use of smaller and more fuel-efficient aircraft on international routes, benefitting medium sized O&D markets like Boston. As shown in Exhibit 4-20, next generation medium-sized widebody aircraft such as the A350 and B787 account for a combined 16.2 percent of Logan's long-haul international seats in July 2019, up 0.6 percentage points from July 2018.

Exhibit 4-20: International Weekly Departing Seat Share by Aircraft (July 2015 – July 2019)

	Weekly Seat Share				
	2015	2016	2017	2018	2019
A330	21.1%	30.9%	34.5%	31.8%	31.9%
B777	10.5%	16.4%	13.7%	13.6%	15.4%
B787	6.3%	8.1%	11.4%	10.6%	13.4%
A380	0.0%	0.0%	2.1%	2.1%	8.1%
B757	8.3%	6.9%	9.8%	3.9%	6.2%
B747	23.9%	12.7%	6.1%	7.7%	3.0%
A350	0.0%	2.3%	5.3%	5.0%	2.7%
Other	29.9%	22.7%	17.0%	25.4%	19.3%

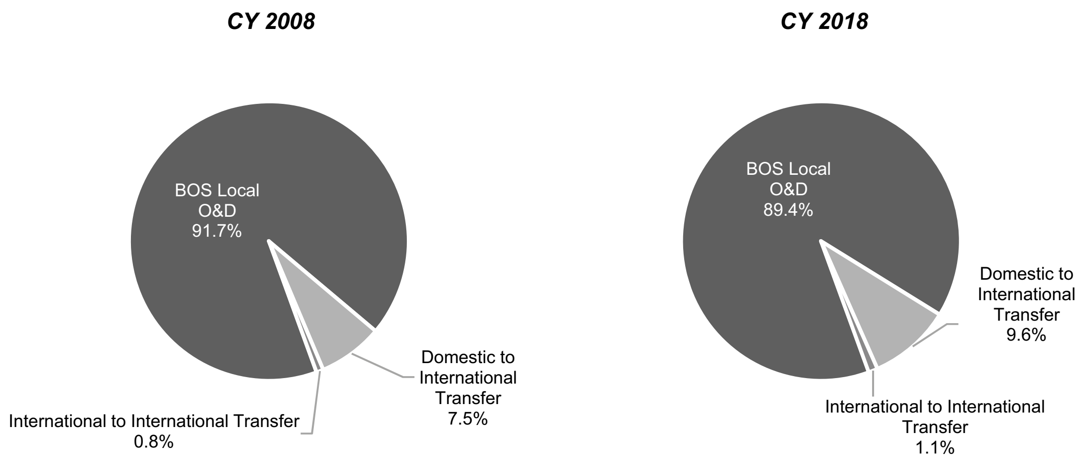
Note: Excludes Caribbean and Canada destinations. July 2019 is using advance schedules. Based on advance schedules, Hainan Airlines will be the only foreign carrier operating an A350 in July 2019 to Beijing; Lufthansa operated an A350 to Munich up until June 2019, and switched to an A340.
Sources: Innovata Schedules.

Recent developments in international air service at Logan are discussed further in Section 4.4.3.

4.3.4 Strength of Boston Logan International Markets

International O&D passengers constitute the majority of international traffic at Logan, although transfer traffic is growing. In CY 2018, international O&D passengers made up 89.4 percent of international passenger traffic at Logan. Domestic to international transfer passengers at Logan were estimated to be about 9.6 percent, while international to international transfer passengers represent only a nominal segment at 1.1 percent. Compared to CY 2008 when Logan Airport did not have as much international service as it does today, Logan's share of international connecting traffic grew slightly. Because the volume of international passengers grew dramatically over the last decade, the absolute number of international connecting passengers grew during this period by over 150%. As both U.S. and foreign carriers introduce attractive new international markets at Boston, Logan Airport will continue to grow as an opportunistic connecting gateway in the U.S, although it is expected that international O&D traffic will continue to dominate the Airport.

Exhibit 4-21: Distribution of Boston Logan International Passengers (CY 2008 vs CY 2018)



Note: Boston Local O&D includes passengers who connect beyond international to their final destinations (e.g., BOS-DUB-AMS).
Sources: IATA PaxIS, YE Dec 2018.

4.3.5 Logan Top O&D Markets

The top 15 domestic O&D markets (as shown in Exhibit 4-22) accounted for approximately 54 percent of Boston's total domestic O&D passengers for CY 2018. The top seven markets listed have near equal O&D shares between 4.0 and 5.9 percent, but are geographically dispersed, spanning the U.S. west coast, the east coast, and the Midwest (Chicago).

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Exhibit 4-22: Top Boston Domestic O&D Passenger Markets (CY 2018)

Rank	City	Nonstop Miles	O&D Psgrs	Pct. of Total	5-Year CAGR	Sched Daily Nonstop Depts	No. of Carriers Serving
1	New York	190	1,719,200	5.9%	4.9%	55	4
2	Chicago	866	1,656,621	5.6%	5.0%	27	5
3	Washington	402	1,513,065	5.2%	2.2%	27	3
4	Los Angeles	2,611	1,404,083	4.8%	6.6%	17	5
5	San Francisco	2,704	1,363,260	4.6%	4.0%	16	4
6	Atlanta	946	1,239,453	4.2%	11.9%	18	4
7	Orlando	1,121	1,180,560	4.0%	4.3%	11	4
8	Baltimore	370	812,631	2.8%	2.0%	17	3
9	Fort Lauderdale	1,237	809,484	2.8%	4.2%	7	3
10	Philadelphia	280	798,916	2.7%	6.7%	21	3
11	Dallas/Fort Worth	1,561	782,253	2.7%	4.9%	11	4
12	Denver	1,754	729,745	2.5%	6.5%	11	4
13	Tampa	1,185	655,357	2.2%	7.1%	6	2
14	Minneapolis	1,124	647,356	2.2%	11.5%	9	3
15	Fort Myers	1,249	624,554	2.1%	4.4%	2	2
	Subtotal Top 15		**15,936,538**	**54.3%**		**256**	
	All Other		13,390,637	45.7%		234	
	Grand Total		**29,327,175**	**100.0%**		**490**	

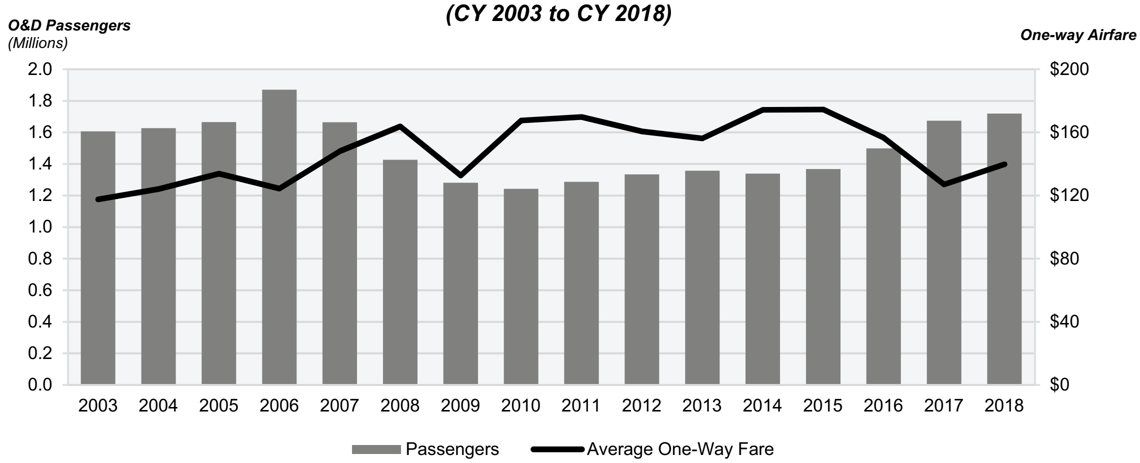
Note: New York includes JFK, LaGuardia and Newark airports. Washington includes Reagan National and Dulles airports. Houston includes Hobby and George Bush Intercontinental airports. Dallas includes Love Field and Dallas/Ft. Worth airports. Chicago includes Midway and O'Hare airports. Totals may not add up due to rounding.

Sources: U.S. DOT, O&D Survey via Airline Data, Inc., CY 2018; Innovata Schedules, July 2019.
Discrepancies between the O&D figures in Exhibit 4-22 and Appendix A to the Official Statement to which this report is attached are due to proprietary data processing methods.

The New York market, which includes traffic to JFK, LaGuardia, and Newark, is now Boston's largest O&D market, however it only accounts for 5.9 percent of total domestic O&D passengers. For CY 2018, there were 1.72 million passengers in the Boston-New York market (Exhibit 4-23). Airlines currently serving the Boston-New York market include the shuttle services offered by Delta, JetBlue, and American to LaGuardia[75] and JFK airports; and JetBlue and United services to Newark. Among the competing airlines, Delta has increased its seat capacity between the two markets by 5.2 percent from July 2018 to July 2019, and has introduced their new A220-100 aircraft on the LaGuardia shuttle service, intending to replace the older B717s and E-170s that operate the segment.

[75] JetBlue began service to New York LGA in October 2016.

Exhibit 4-23: Passengers and Average Fares in the Boston - New York Market (CY 2003 to CY 2018)



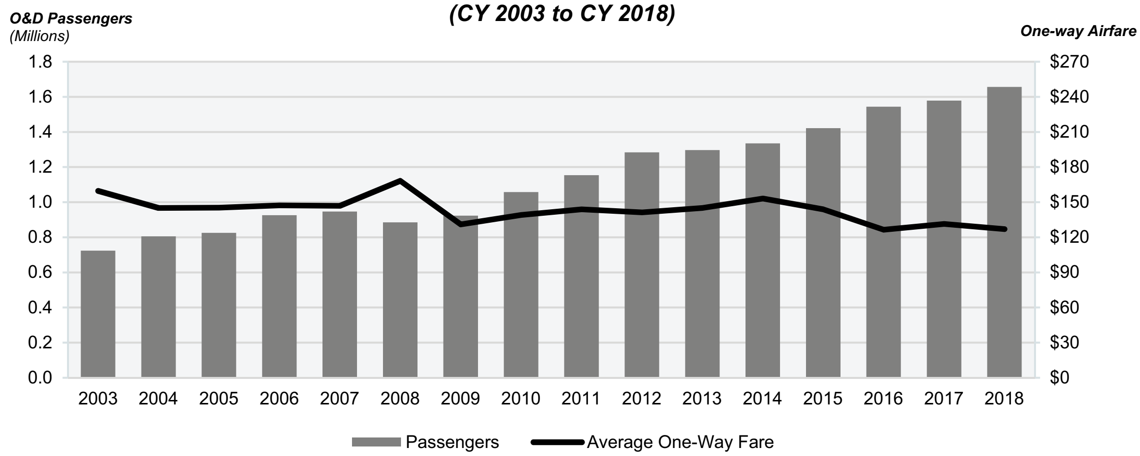
Note: New York market includes JFK, EWR, and LGA.
Source: U.S. DOT, O&D Survey via Airline Data, Inc.

Demand in the Boston-New York market has fallen by approximately 8.1 percent from peak level traffic of 1.9 million O&D passengers in 2006 prior to the global financial crisis of 2008/2009, while the average fare has increased by 12.4 percent from $124 in CY 2006 to $140 by CY 2018. Several factors coalesced over this period to lower Boston-New York air passenger demand, including the availability of competitive rail and bus modes. Amtrak introduced high-speed Acela Express service along the Northeast Corridor in December 2000,[76] and frequent low-cost bus services emerged as attractive alternatives to air travel. Greater levels of airline passenger security screening after 9/11 and increased road traffic congestion to reach the airports also decreased the relative attractiveness of air travel in short-haul markets, like Boston-New York between the 2008-2015 period. Demand declined further during the global economic downturn and credit crisis, which weakened both leisure and business travel demand. Several years after 2009, passenger levels stabilized at around 1.3 million and then began to rise starting in 2016, reaching 1.7 million passengers by 2018. Average one-way fares have fluctuated and dropped from $174 to $140 in the last three years to compete with alternative methods of air travel and multiple airlines are competing for passenger share. The New York-Washington, D.C. market has been similarly affected by these trends as well.

The Chicago market, which includes traffic to O'Hare and Midway, is currently Boston's second largest O&D market. Boston-Chicago O&D has shown strong growth since 2009, reaching over 1.65 million annual passengers in CY 2018 (Exhibit 4-24). Airlines serving the Boston-Chicago market include United, American, JetBlue, and Spirit Airlines service to O'Hare; and Southwest service to Midway. Demand in the Boston-Chicago market has steadily increased since 2003, with an absolute increase of over 125 percent, from 723,000 to 1.65 million annual O&D passengers. The average fare has decreased substantially since 2008, from $168 to $127 in 2018, a 25 percent decrease in fare cost. Despite substantial decreases in passengers in other large O&D markets like New York, passenger levels to Chicago remained fairly flat during the global economic downturn and credit crisis, and have steadily risen since 2009, growing on average 6.7 percent between 2009 and CY 2018. Over that time period, average fares have decreased 0.3 percent.

[76] In addition to the Acela Express service that is operated with high-speed trains, Amtrak also provides regional service with conventional train sets.

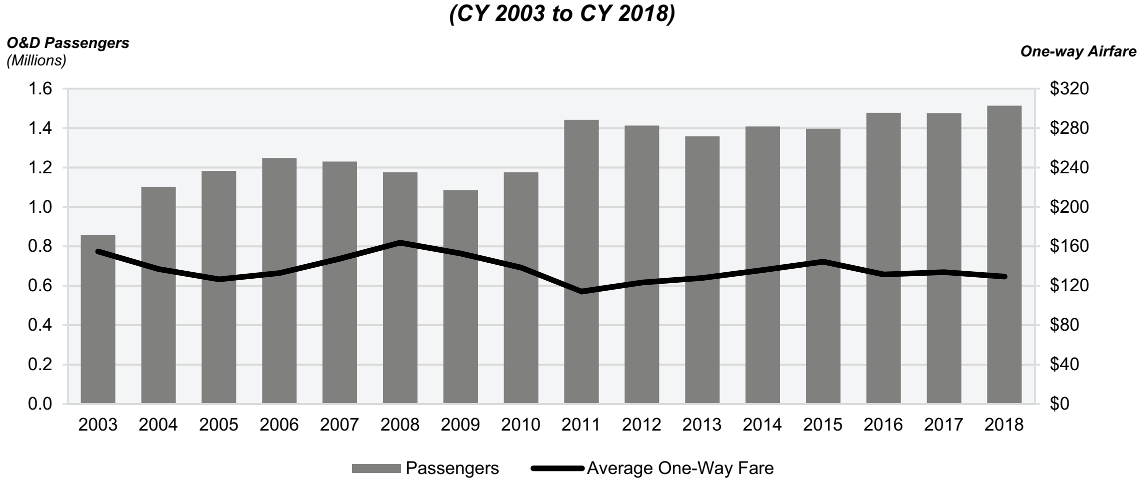
Exhibit 4-24: Passengers and Average Fares in the Boston–Chicago Market (CY 2003 to CY 2018)



Note: Chicago market includes ORD and MDW.
Source: U.S. DOT, O&D Survey via Airline Data, Inc.

Washington D.C. is Boston's third largest O&D market. The stimulating effect of JetBlue's frequent, low-fare Boston-Washington Reagan National (DCA) service is reflected in the post-2010 passenger data in Exhibit 4-25. From 2009, the year before JetBlue commenced its Boston-Washington Reagan National service, to 2011, O&D passengers increased by 32.8 percent and the average fare fell by 25.2 percent. For CY 2018, there were 1.51 million Boston-Washington, D.C. O&D passengers, compared to 857,000 in 2003.

Exhibit 4-25: Passengers and Average Fares in the Boston–Washington, D.C. Market (CY 2003 to CY 2018)



Note: Washington market includes IAD and DCA.
Source: U.S. DOT, O&D Survey via Airline Data, Inc.

The geographic distribution of Boston passenger demand has continued to evolve at the margins. As shown in Exhibit 4-26, the Southeast, which is dominated by the Florida markets, is currently the leading destination region for Boston O&D passengers, accounting for 30 percent of domestic O&D passengers. The Mid-Atlantic region has declined slightly and now represents 21 percent of domestic demand compared to 23 percent in 2013. The Southwest region is the fastest growing destination region, but only accounts for 9 percent of domestic O&D passengers. New England O&D passengers have declined from over 406,000 in 1991 to approximately 131,700 passengers in CY 2018.

Exhibit 4-26: Boston Logan Airport Domestic O&D Passengers by Region (CY 2006, CY 2011, and CY 2018)

	O&D Passengers			% of BOS Market Share			CAGR
Region	**CY 2008**	**CY 2013**	**CY 2018**	**CY 2008**	**CY 2013**	**CY 2018**	**'08-'18**
Southeast	5,782,498	6,268,106	8,656,620	30%	28%	30%	4.1%
Mid Atlantic	4,314,986	5,069,217	6,077,084	22%	23%	21%	3.5%
Pacific	3,593,733	4,267,809	5,519,549	19%	19%	19%	4.4%
Great Lakes	2,192,921	2,558,083	3,599,491	11%	11%	12%	5.1%
Southwest	1,365,940	1,888,519	2,553,193	7%	8%	9%	6.5%
Midwest	812,191	883,358	1,266,082	4%	4%	4%	4.5%
Mountain	728,885	841,082	1,230,009	4%	4%	4%	5.4%
U.S. Territories	379,347	397,809	293,370	2%	2%	1%	-2.5%
New England	130,426	135,554	131,777	1%	1%	0%	0.1%
Total	**19,300,927**	**22,309,537**	**29,327,175**				**4.3%**

Note: Southeast includes AL, LA, MS, GA, NC, TN, FL, SC, and AR.
Source: U.S. DOT, O&D Survey via Airline Data, Inc.

4.4 Scheduled Airline Service

Airline service and aircraft operation at Logan can be grouped into three major market segments: domestic large jet, domestic regional, and international. Domestic large jet service includes all domestic services operated by aircraft of 90 or more seats, including the Embraer EMB-190 aircraft operated by JetBlue. Domestic regional service includes domestic services operated by smaller regional jets of less than 90 seats and turboprop/piston aircraft. The domestic large jet and international segments have principally served O&D passengers, while domestic regional carrier services historically operated as feeder flights carrying passengers from small New England and upstate New York markets to Logan Airport for connecting services to other destinations (see maps in Exhibit 4-31).

4.4.1 Domestic Large Jet Service

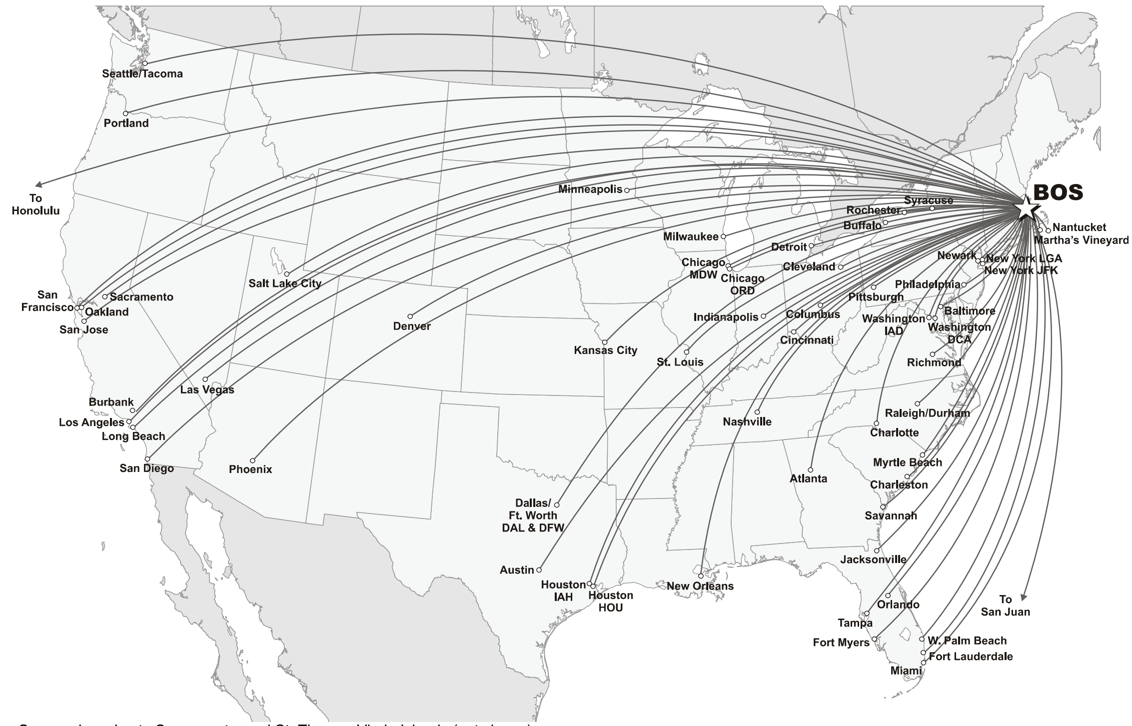
Ten U.S. airlines provide scheduled domestic large jet services at Logan as of July 2019 (Exhibit 4-27). Frontier Airlines and Hawaiian Air Lines are the two latest additions commencing service in April 2019. Logan is served by all major U.S. carriers with operating revenues over $1 billion (except Allegiant). Logan's current nonstop domestic jet service is illustrated in Exhibit 4-28.

Exhibit 4-27: U.S. Large Jet Carriers Serving Logan Airport (As of July 2019)

U.S. Large Jets	
Alaska Airlines	JetBlue Airways
American Airlines	Southwest Airlines
Delta Air Lines	Spirit Airlines
Frontier Airlines	Sun Country
Hawaiian Air Lines	United Airlines

Source: Innovata Schedules.

Exhibit 4-28: Domestic Nonstop Large Jet Markets Served from Logan Airport (July 2019)



Note: Seasonal service to Sacramento, and St. Thomas Virgin Islands (not shown).
Source: Innovata Schedules.

Changes in Logan's scheduled large jet domestic airline services by FSCs and LCCs over the past year are shown in Exhibit 4-29. Domestic large jet services decreased slightly in 2019 by six daily departures. In 2019, Delta accounts for the largest increase, adding a daily frequency to each of the Cincinnati, Las Vegas, New York, Raleigh/Durham, and Tampa markets utilizing their large jet aircraft. In addition, Delta announced new nonstop service to Washington-Reagan National, Chicago-O'Hare, and New York-Newark, beginning September 2019.[77]

JetBlue is expected to increase frequencies in markets such as Charlotte, Las Vegas, Raleigh/Durham, and San Diego. Overall, JetBlue will add one average daily departure in July 2019 compared to the previous year. Over the past decade, Delta and JetBlue have been showcasing the highly competitive landscape of the Boston market. Whenever one airline shifts its capacity or announces new service to/from Boston, the other will respond with similar changes to capture and/or re-capture its capacity share.

American and Southwest have seen a decline in average daily frequency from Logan. American is expected to decrease nonstop daily departures, specifically from Boston to New York-JFK, Chicago-O'Hare, and Washington National, while Southwest has reduced its nonstop daily departures to Atlanta, Chicago-Midway, Houston-Hobby, Indianapolis, Kansas City, and Milwaukee.

In April 2019, Frontier and Hawaiian Air Lines commenced service from Boston. After a 7-year hiatus, Frontier re-commenced its nonstop service from Boston to Denver, added new daily service to Orlando, and began service to Raleigh/Durham. Hawaiian Air Lines also commenced its longest domestic flight segment flying between Boston and Honolulu daily on its A330 aircraft.

[77] Delta News Hub website.

Exhibit 4-29: Scheduled Large Jet Domestic Airline Service at Logan Airport (July 2018 vs July 2019)

Reporting Carrier	Avg. Nonstop Daily Departure July '18	Avg. Nonstop Daily Departure July '19	Change '18 - '19 Net Change	Change '18 - '19 % Change
Alaska	12	10	-2	-16.7%
American	80	72	-8	-10.0%
Delta	49	53	4	8.2%
Frontier	0	3	3	New
Hawaiian Air Lines	0	1	1	New
JetBlue	144	145	1	0.7%
Southwest	38	33	-5	-13.2%
Spirit Airlines	16	15	-1	-6.3%
Sun Country	2	1	-1	-50.0%
United	42	42	0	0.0%
Total	**383**	**375**	**-8**	**-2.1%**

Notes: JetBlue and American mainline departures include operations with the Embraer E-190 large regional jet. Net changes may not sum due to rounding of average calculations.
Source: Innovata Schedules.

4.4.2 Regional Domestic Service

Eleven U.S. regional carriers provide domestic passenger services at Logan Airport as of July 2019 (see Exhibit 4-30). The majority of U.S. regional carriers serving Logan are either wholly owned by an FSC or operate under joint marketing agreements with FSCs. Regional airlines Republic Airlines and SkyWest Airlines operate for more than one FSC. The domestic services provided by the mainline, independent, and affiliated regional carriers are shown in Exhibit 4-31.

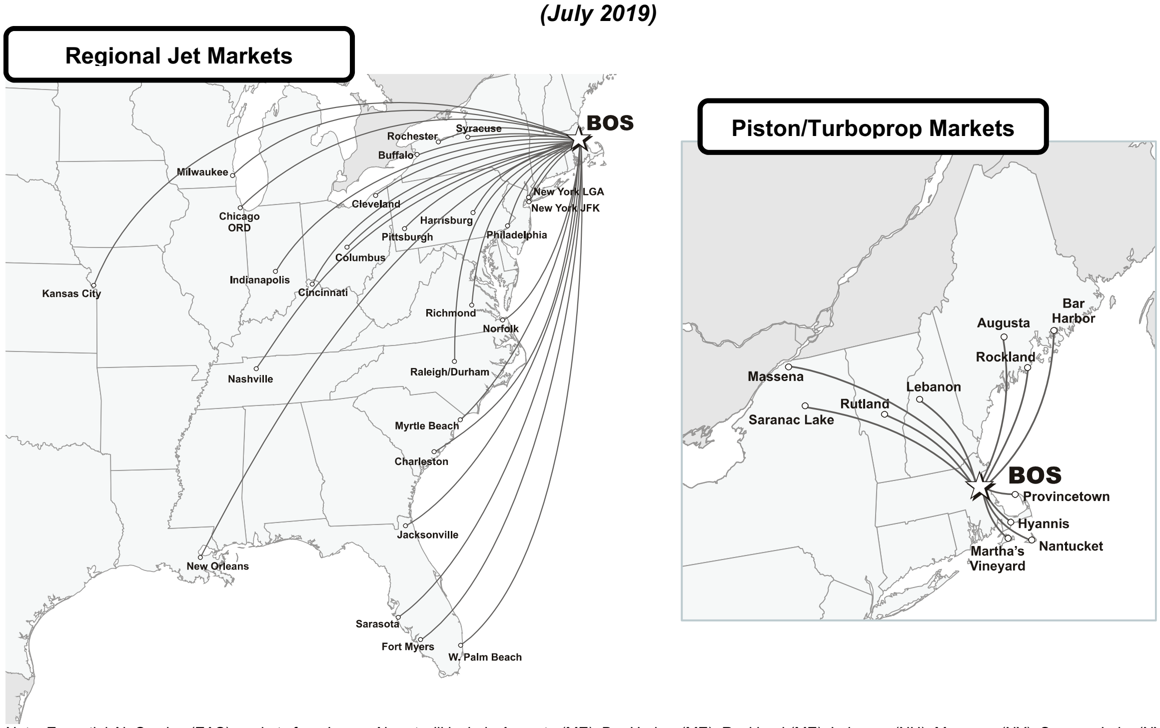
Exhibit 4-30: Domestic Regional Airlines (and Affiliates) Operating at Logan Airport

Independent
Boutique Air
Cape Air
Silver Airways

Affiliated
Endeavor Air (Delta Connection)
Envoy Air (American Eagle)
GoJet (Delta Connection)
Mesa Airlines (United Express)
Piedmont Airlines (American Eagle)
PSA Airlines (American Eagle)
Republic Airlines (American Eagle, Delta Connection, and United Express*)
SkyWest Airlines (Delta Connection and United Express*)

*Republic and SkyWest have historically operated regional flights as a United Express affiliate, however it is not listed in schedules between July 2019 to December 2019.
Note: Regional carriers providing domestic service only. Cape Air includes Hyannis Air. Endeavor Air was previously named Pinnacle Air. Shuttle America ceased operations and merged with Republic Airlines in February 2017.
Source: Innovata advance schedules July 2019 to December 2019.

Exhibit 4-31: Regional Carrier Domestic Nonstop Markets Served from Logan Airport (July 2019)



Note: Essential Air Service (EAS) markets from Logan Airport will include Augusta (ME), Bar Harbor (ME), Rockland (ME), Lebanon (NH), Massena (NY), Saranac Lake (NY), and Rutland (VT) –Congressional Research Service Report, December 2018. Sarasota is seasonal service.
Source: U.S. Department of Transportation; Innovata Schedules

Small regional jet services grew rapidly at Logan Airport at the beginning of the 2000s, when airlines deployed RJs to replace smaller turboprop aircraft and to compete with other airlines on short-haul high-density routes. Following the run-up in fuel prices in 2007 and pilot shortage in 2015, airlines have eliminated large numbers of smaller regional jets from their fleets because of high per seat operating costs. Between 2014 and 2016, the share of average RJ daily departures at Logan declined sharply (see Exhibit 4-32), but then rebounded over the next three years, driven mainly by Delta utilizing its CRJ-700/900 and Embraer E-175 aircraft for Boston's top domestic O&D market, New York City. The slight decline in operating costs per available seat mile during that time period (as discussed in Chapter 2) also made it feasible for Delta to add frequencies on that route. Daily nonstop departures between Boston and New York as of July 2019 advance schedules increased by 64 percent from July 2014. While service to New York has increased, American and United have reduced their nonstop RJ service to other destinations, and as a result, overall RJ daily operations saw minimal change over the past five years. Major market routes with shuttle service (e.g., Delta's New York shuttle to LGA) have seen increased utilization in RJ aircraft given the high demand of O&D passengers between the two markets.

Daily departures are scheduled to decrease as air carriers eliminated short-haul turboprop destinations in July 2019 (e.g., Syracuse and Harrisburg) and have begun to upgauge their regional medium-haul routes with newer, larger RJ and jet aircraft. As a result, net daily turboprop service has been reduced by approximately 19 percent since 2014, but RJ aircraft average daily departures have grown from 46 to 55 between July 2017 and 2019.

In 2019, Cape Air removed its three daily frequencies to Albany and mitigated that reduction by increasing services to Hyannis, Nantucket, and Provincetown on its turboprop / piston aircraft, which service has experienced improved feeder traffic due to its partnership with JetBlue at Logan. Non-jet frequencies will decrease by three percent in July 2019 compared to 2018. Boutique Air and Silver Airways entered the turboprop market in summer 2018, providing nonstop service to Massena (NY) and Bar Harbor (ME), respectively.

Exhibit 4-32: Scheduled Regional Domestic Airline Service at Logan Airport (July 2014 to July 2019)

	Average Nonstop Daily Departure						Change '14 - '19		Change '18 - '19	
Reporting Carrier	'14	'15	'16	'17	'18	'19	Net Change	% Change	Net Change	% Change
Regional Jets										
American	14	15	8	11	10	5	-9	-64%	-5	-50%
Delta	31	27	25	31	42	50	19	61%	8	19%
United	9	6	4	4	3	0	-9	-100%	-3	-100%
Subtotal	**54**	**48**	**37**	**46**	**55**	**55**	**1**	**2%**	**0**	**0.0%**
Turboprops / Pistons										
American	3	1	1	0	0	0	-3	-100%	0	
Boutique Air	0	0	0	0	3	3	3		0	0%
Cape Air	69	75	74	62	61	59	-10	-14%	-2	-3%
PenAir	7	7	6	6	0	0	-7	-100%	0	
Silver Airways	0	0	0	0	2	2	2		0	0%
Other	0	0	5	1	0	0	0		0	
Subtotal	**79**	**83**	**86**	**69**	**66**	**64**	**-15**	**-19%**	**-2**	**-3%**
Total Daily Departures	**133**	**131**	**123**	**115**	**121**	**119**	**-14**	**-11%**	**-2**	**-2%**

Note: July 2019 is using advance schedules. May not sum to total due to rounding; "Other" turboprop regional airlines include Servant Air, Tradewind Aviation, and United Express. Net changes may not sum due to rounding of average calculations. According to advance 2019 schedules, in August 2019 and September 2019, United Express and its regional affiliates Mesa and Republic are scheduled to provide an average of one weekly scheduled RJ departure to Washington Dulles and New York Newark, on existing United large jet service to those markets.
Source: Innovata Schedules.

4.4.3 International Service

Three U.S. and 31 foreign flag airlines will provide scheduled services from Logan Airport to international destinations as of July 2019 (Exhibit 4-33). The three major global airline groups – oneworld, SkyTeam and Star – are represented at Logan Airport by multiple carriers. Exhibit 4-34 shows the international markets served nonstop from Logan in July 2019.

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Exhibit 4-33: U.S. and Foreign Carriers Providing International Service at Logan Airport (July 2019)

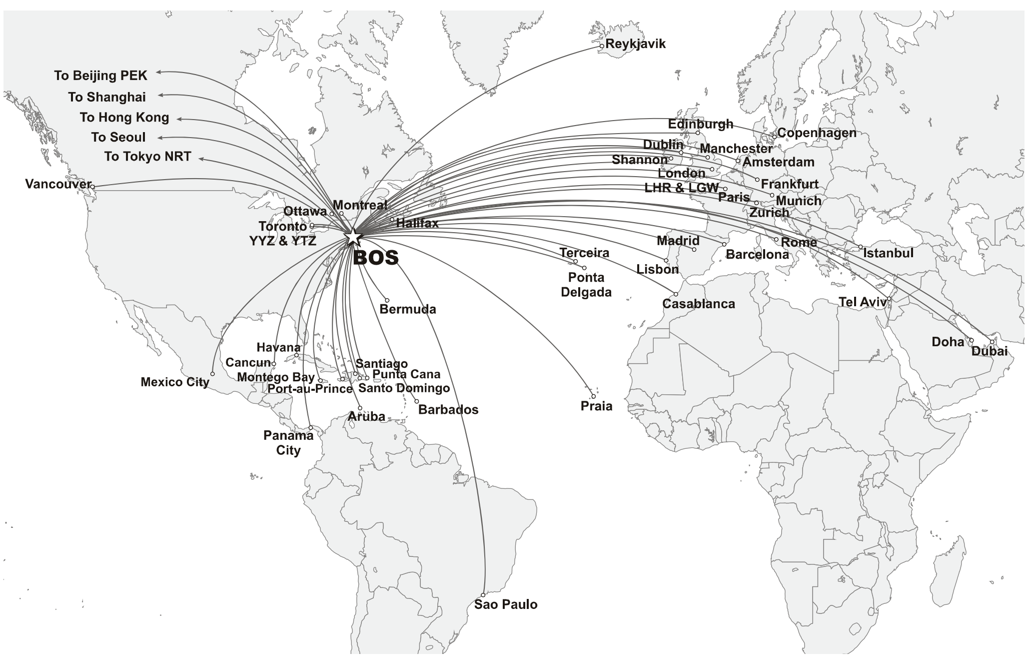
U.S. Flag Airlines
American Airlines (oneworld)
Delta Air Lines (SkyTeam)
JetBlue Airlines

Foreign Flag Airlines	
Aer Lingus	LEVEL
Air Canada* (Star)	Lufthansa (Star)
Air France (SkyTeam)	Norwegian Air Shuttle
Alitalia (SkyTeam)	Norwegian UK Air
British Airways (oneworld)	Porter Airlines
Cathay Pacific (oneworld)	Qatar (oneworld)
Copa Airlines (Star)	Royal Air Maroc** (oneworld)
El Al	SAS (Star)
Emirates	SATA Internacional
Hainan Airlines	SWISS (Star)
Iberia (oneworld)	TACV-Cabo Verde Airlines
Icelandair	TAP Portugal (Star)
Japan Airlines (oneworld)	Turkish Airlines (Star)
KLM (SkyTeam)	Virgin Atlantic Airways (SkyTeam)
Korean Air (SkyTeam)	WestJet (SkyTeam)
LATAM (oneworld)	

*Includes regional carriers Jazz Air and Sky Regional Airlines, both of which operate at Logan as part of Air Canada Express.
**Royal Air Maroc is expected to be implemented into oneworld by mid-2020.

Note: Excludes U.S. regional airline affiliates serving the U.S. and Canada. Not shown: low cost carrier LEVEL Airlines, owned by International Airlines Group ("IAG"), is operated by Iberia on its Barcelona service.
Source: Innovata Schedules.

Exhibit 4-34: Nonstop International Service from Logan Airport (July 2019)



Note: The following are operated on a seasonal basis: Grand Cayman (November-June), Liberia (November-April), Madrid (May-December), Manchester (May-October), Nassau (September-June), Providenciales (November-June), Port Au Prince (November-June), Saint Lucia (November-June), Saint Maarten (November-June), and Vancouver (June-September).
Source: Innovata Schedules

Exhibit 4-35 below shows international carrier service changes at Logan from July 2018 to July 2019. Logan has seen a significant expansion of international services in recent years. In the last year, international service levels at Logan increased by approximately 2.5 percent from 561 weekly departures in July 2018 to 575 weekly departures in July 2019. Much of the growth in international services over the past few years is due to the entry of new carriers and the implementation of increased frequencies by existing carriers (see Section 4.4.4.2 herein). Delta increased its nonstop international daily departures in July 2019 by 27 percent with expanded seasonal Caribbean service and new European service to destinations like Edinburgh and Lisbon.[78] Air Canada via its regional affiliates has also ramped up its weekly departures to destinations in Canada, nearly matching Delta's and JetBlue's international services.

Exhibit 4-35: Scheduled International Service at Logan International Airport (July 2018 vs July 2019)

Reporting Carrier	Avg. Weekly Dep. July '18	Avg. Weekly Dep. July '19	Change ('18 - '19) Net Change	Change ('18 - '19) % Change	Reporting Carrier	Avg. Weekly Dep. July '18	Avg. Weekly Dep. July '19	Change ('18 - '19) Net Change	Change ('18 - '19) % Change
Jets									
Aer Lingus	21	21	0	0%	SAS	4	7	3	75%
Aeromexico	7	0	-7	-100%	SATA Internacional	11	12	1	9%
Air Canada	20	55	35	175%	SWISS	13	13	0	0%
Air France	14	14	0	0%	TACV	1	1	0	0%
Alitalia	7	7	0	0%	TAP	7	7	0	0%
American	1	1	0	0%	Thomas Cook Airlines	3	0	-3	-100%
AVIANCA	4	0	-4	-100%	Turkish Airlines	7	7	0	0%
British Airways	28	28	0	0%	Virgin Atlantic	9	17	8	89%
Cathay Pacific	7	7	0	0%	WOW air	7	0	-7	-100%
Copa Airlines	11	11	0	0%					
Delta	47	60	13	28%	**Subtotal**	**378**	**441**	**63**	**17%**
El Al	3	3	0	0%					
Emirates	7	7	0	0%	**Regional Jets**				
Hainan Airlines	11	11	0	0%	Air Canada	97	47	-50	-52%
Iberia	9	10	1	11%					
Icelandair	14	14	0	0%	**Subtotal**	**97**	**47**	**-50**	**-52%**
Japan Airlines	7	7	0	0%					
JetBlue	49	58	9	18%	**Turboprops / Pistons**				
KLM	0	4	4	N/A	Air Canada	13	13	0	0%
Korean Air	0	5	5	N/A	Porter Airlines	45	45	0	0%
LATAM	4	5	1	25%	WestJet	28	28	0	0%
Lufthansa	21	21	0	0%					
Norwegian	10	18	8	80%	**Subtotal**	**86**	**86**	**0**	**0%**
Primera Air	7	0	-7	-100%					
Qatar	7	7	0	0%	**Total Weekly Departures**	**561**	**574**	**13**	**2%**
Royal Air Maroc	0	3	3	N/A					

Note: Air Canada includes Air Canada Express. July 2019 is using advance schedules. Net changes may not sum due to rounding of average calculations.
Source: Innovata Schedules.

Logan's international services remain heavily oriented toward European destinations, with growth moving Boston into the position of 5th busiest U.S. gateway for transatlantic air travel for the 12-months ended September 2018 (Exhibit 4-36). The Airport has increased in rank from the 8th busiest U.S. gateway for transatlantic traffic in CY 2015 to 5th as of CY 2018. As of July 2019, 238 weekly departures to Europe are scheduled, representing 41.3 percent of total international seat capacity at Logan Airport.

5th
Largest Transatlantic Gateway

[78] Innovata schedules: Edinburgh and Lisbon (commenced May 2019).

Exhibit 4-36: Top U.S. Gateways for Transatlantic Passengers (YE Nov 2018) [79]

Psgr. Rank	U.S. Gateway	Total Psgrs. YE Nov 2018	Percent Share	CAGR 2013-YE Nov 18	Psgr. Rank	U.S. Gateway	Total Psgrs. YE Nov 2018	Percent Share	CAGR 2013-YE Nov 18
1	New York	25,766,200	31.4%	4.5%	9	Philadelphia	2,334,859	2.8%	-0.6%
2	Los Angeles	6,338,785	7.7%	11.6%	10	Orlando	2,163,863	2.6%	10.8%
3	Chicago	6,227,844	7.6%	4.0%	11	Houston	2,130,386	2.6%	0.2%
4	Washington	5,243,881	6.4%	1.6%	12	Dallas/Fort Worth	1,949,790	2.4%	6.9%
5	**Boston**	**4,445,857**	**5.4%**	**9.4%**	13	Seattle/Tacoma	1,755,787	2.1%	11.6%
6	Atlanta	4,314,291	5.3%	3.1%	14	Detroit	1,694,861	2.1%	3.5%
7	Miami	4,310,486	5.3%	7.3%	15	Minneapolis	1,046,435	1.3%	4.8%
8	San Francisco	4,278,010	5.2%	8.3%					
	Subtotal: Top 15	**74,001,335**	**90.3%**						
	Other	7,966,854	9.7%						
	Grand Total	**81,968,189**	**100.0%**						

Note: includes Atlantic international services only (Africa, Europe, and Middle East).
Source: U.S. DOT, T-100 Database via Airline Data, Inc.

4.4.4 Significant Air Service Trends

The expansion of service by LCCs and international carriers has driven the majority of passenger and capacity growth at Logan, further solidifying the Airport's dominance in the New England market. JetBlue is the largest carrier at the Airport in terms of seats and 31 international carriers now serve the Airport. These major trends will be further discussed in the sections below.

4.4.4.1 Low Cost Carrier (LCC) Development

Logan Airport currently is serviced by five domestic LCCs: JetBlue, Southwest, Spirit Airlines, Sun Country, and Frontier.[80] In addition to these domestic low cost carriers, Logan also is serviced by four foreign LCCs, including LEVEL, Norwegian Air[81], Porter, and WestJet. As of July 2019 schedules, JetBlue accounts for 67 percent of LCC traffic followed by Southwest at 17 percent, and Spirit at 9 percent.

Since entering the Boston market in 2004, JetBlue has grown to become Logan's largest carrier, offering 1,076 weekly departures to 57 destination markets for the summer 2019 season (Exhibit 4-37). JetBlue has significantly broadened its network at Boston to include transcontinental flights, business destinations, and flights to the Caribbean in addition to its traditional Florida destinations. Most recently, JetBlue has announced its open orders for thirteen (13) Airbus A321LR aircraft (which replaced 13 of their initial A321neo orders), making it feasible for them to fly transatlantic to Europe. The introduction of longer range narrowbody planes like the Airbus A321LR will benefit Logan Airport, as the economics of these aircraft open up new lower density markets in Europe to direct service to and from Boston. Short-haul destinations along the busy northeast corridor now account for roughly 23 percent of JetBlue's flights from Logan, and Florida markets represent approximately 13 percent of JetBlue's flights, down from 24 percent nine years ago, given the increased diversity of services. Approximately 55 percent of JetBlue's services are to other domestic medium- and long-haul markets. JetBlue also offers extensive services to the Caribbean and Central America, which accounts for 57 weekly flights or 5.3 percent of the carrier's July 2019 scheduled flights.

[79] The U.S. DOT has not yet released international T-100 data for CY 2018. Latest available international traffic data is November 2018.
[80] Frontier commenced service in late April 2019
[81] Norwegian Air includes Norwegian Air Shuttle and Norwegian UK Air entities.

Exhibit 4-37: Change in Low Cost Carrier Share of Weekly Departures and Seats at Logan (July 2017 to July 2019)

Carrier	2017 Avg. Weekly Deps.	2017 Avg. Weekly Seats	2017 Avg. Weekly Seat Share	2018 Avg. Weekly Deps.	2018 Avg. Weekly Seats	2018 Avg. Weekly Seat Share	2019 Avg. Weekly Deps.	2019 Avg. Weekly Seats	2019 Avg. Weekly Seat Share
JetBlue	1,008	124,493	65.9%	1,057	134,535	67.2%	1,076	136,458	68.1%
Southwest	269	40,301	21.3%	263	40,126	20.1%	231	35,077	17.5%
Spirit Airlines	98	15,972	8.5%	109	18,113	9.1%	105	19,173	9.6%
Frontier	-	-	-	-	-	-	18	3,211	1.6%
Porter Airlines	44	3,051	1.6%	45	3,145	1.6%	45	3,161	1.6%
WestJet	28	2,184	1.2%	28	2,184	1.1%	28	2,184	1.1%
Sun Country	20	2,996	1.6%	13	1,950	1.0%	7	1,134	0.6%
Total	**1,466**	**188,996**	**100.0%**	**1,514**	**200,053**	**100.0%**	**1,511**	**200,399**	**100.0%**

Note: Includes weekly scheduled departures and seats to domestic, Caribbean, and Mexican destinations; excludes European nonstop destinations. Net changes may not sum due to rounding of average calculations.
Source: Innovata Schedules, July 2017 to July 2019.

JetBlue has entered into 14 marketing partnerships with other U.S. and foreign airlines. These partnerships are primarily structured as interline agreements that allow passengers to book one itinerary on multiple carriers. JetBlue's partnerships with Aer Lingus, Cape Air, El Al, Emirates, Hawaiian Air Lines, Hainan Airlines, Iberia, Icelandair, Japan Airlines, Korean Air, Lufthansa, Porter Airlines, TAP Portugal, and Turkish Airlines allow passengers flying to or from markets that JetBlue would otherwise not serve to connect to JetBlue flights at the Airport, further strengthening its position at Logan Airport[82]. The partnerships with Aer Lingus, Cape Air, Japan Airlines, Lufthansa, and Turkish are one-way code sharing agreements, where the partner airlines place their operating codes and flight numbers on flights operated by JetBlue creating a seamless travel experience for passengers connecting at Logan. JetBlue has a two-way codeshare partnership with Emirates. The two-way code share agreements allow partner airlines to place their code on flights operated by JetBlue and vice versa.

Southwest is currently the second largest LCC at Logan Airport. Southwest introduced service to Logan Airport in August 2009 after having served the Boston market from the T.F. Green and Manchester-Boston airports since the late 1990s. After emerging recently from a period of network reconciliation and operations integration following its merger with AirTran, Southwest is scheduled to provide 231 weekly nonstop departures serving 13 destinations (Atlanta, Austin, Baltimore, Chicago Midway, Columbus, Dallas Love Field, Denver, Houston Hobby, Indianapolis, Kansas City, Milwaukee, Nashville, and St. Louis) as of July 2019.

Since 2010, ULCC Spirit Airlines has increased the number of destinations it serves from Logan from three to 12. Spirit provides year-round service to Atlanta, Baltimore, Fort Lauderdale, Myrtle Beach, New Orleans, Orlando, and Las Vegas, as well as seasonal service to Chicago O'Hare, Cleveland, Dallas/Ft. Worth, Detroit, and Raleigh/Durham. As of July 2019, Spirit is scheduled to operate 105 weekly flights on average.

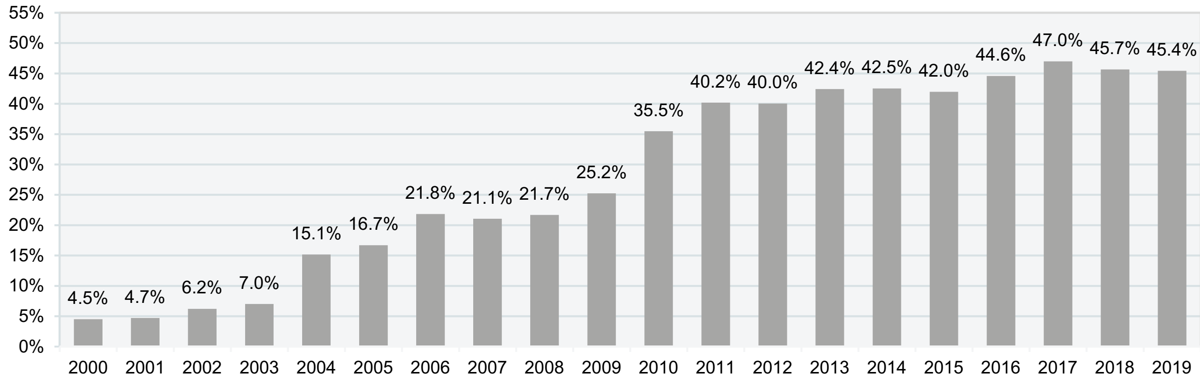
Sun Country Airlines, Frontier, WestJet, and Norwegian Air Shuttle each currently account for less than two percent of weekly seats at Logan Airport. Sun Country provides nonstop service to Minneapolis, with seven weekly flights as of July 2019. Canadian LCC WestJet launched service in March 2016, and currently provides nonstop services to Halifax and Toronto. Icelandic ULCC WOW Air launched Boston-Reykjavik nonstop service in March 2015, operating year-round to Reykjavik with fares marketed as low as $39 USD one-way, however in March 2019, they ceased operations. Norwegian Air (combined Air Shuttle and UK entities) – the fifth largest LCC in Europe as of July 2019 – launched service at Logan in April 2016 and currently provides nonstop services to London Gatwick, Paris, Rome, and Madrid. Norwegian's long-haul services from mainland Europe have been made possible through the use of next generation Boeing B787 aircraft, which allows for profitable flying in thinner long-haul markets like Boston.

As of July 2019, LCCs provide 45.4 percent of the domestic seat capacity at Logan Airport, up dramatically from 15.1 percent in 2004 when JetBlue first launched service at the Airport (Exhibit 4-38). Between 2009 and 2011,

[82] JetBlue also has codeshare relationships with Etihad, Qatar Airways, Singapore Airlines, and South African Airways, allowing their passengers to travel to/from Boston on JetBlue flights at select stations (such as New York JFK and Washington National) and then connect to their own operated flights.

there was a noticeable increase in the LCC share as Southwest and Virgin America initiated services at Logan and as JetBlue expanded by entering markets where FSCs had reduced frequencies. By way of comparison, the LCC share of total U.S. domestic scheduled seats grew steadily from 1990 through 2010. Since then, the U.S. LCC seat share has stabilized at approximately 30.0 percent.

Exhibit 4-38: Low Cost Carrier Share of Weekly Domestic Seats at Logan Airport (July 2000 to July 2019)



Source: OAG Schedules, July 2000 to July 2003, Innovata Schedules, July 2004 to July 2019.

4.4.4.2 International Carrier Development

Since 2013, Logan has seen a rapid expansion of international service with the addition of 18 foreign carriers (that are still operating today) serving 14 new international destinations, as outlined in Exhibit 4-39. As of June 1, 2019, three U.S. carriers and 31 foreign carriers provided service to 56 international destinations from Logan.[83]

Exhibit 4-39: New Foreign Carriers International Services at Logan Airport Over the Past Six Years (2013-2019)

Carrier	Destination	Service Began
Copa Airlines	Panama City	July 2013
Emirates	Dubai	March 2014
Turkish Airlines	Istanbul	May 2014
Hainan Airlines	Beijing	June 2014
	Shanghai	June 2015
Cathay Pacific	Hong Kong	May 2015
Aeroméxico	Mexico City*	June 2015
El Al	Israel	June 2015
Norwegian Air	London Gatwick	March 2016
	Paris	May 2018
	Rome	March 2019
	Madrid	May 2019
Qatar Airlines	Doha	March 2016
Scandinavian	Copenhagen	March 2016

Carrier	Destination	Service Began
WestJet	Toronto	March 2016
	Halifax	April 2016
	Montreal *	October 2017
TAP Portugal	Lisbon	June 2016
Virgin Atlantic	Manchester	March 2017
Avianca	Bogota *	June 2017
	San Salvador *	August 2018
Air Canada	Vancouver	June 2017
LEVEL	Barcelona	March 2018
LATAM	Sao Paolo	June 2018
KLM	Amsterdam	March 2019
Korean Air	Seoul	April 2019
Royal Air Maroc	Casablanca	June 2019

Note: After starting service in June 2016, Eurowings stopped seasonal service from Cologne-Bonn to Boston in September 2016. LEVEL Air is operated by Iberia.
* Indicates service has ceased according to Innovata schedules and advance schedules.
Source: Innovata Schedules.

[83] Massport.

In 2018, LEVEL Air (LCC established by IAG (International Airlines Group)), and operated under an Iberia flight code) launched nonstop flights to Barcelona, which complemented existing Iberia service to Madrid. Going into calendar year 2019, Logan saw the arrival of three new foreign carriers to Logan – KLM, Korean, and Royal Air Maroc. KLM began nonstop service to Amsterdam, complementing existing Delta service there. Korean Air commenced daily service to its main hub in Seoul in April 2019 on their newly acquired B787 Dreamliner. After the announcement that Royal Air Maroc will be joining oneworld in mid-2020, Royal Air Maroc announced nonstop service from Boston to Casablanca as well, commencing in June 2019. Norwegian Air expanded its transatlantic service from Boston to two additional European markets, Rome and Madrid in March 2019 and May of 2019, respectively.

In addition to foreign carrier growth at Logan, U.S. carriers JetBlue, American, and Delta have also expanded international services in recent years. JetBlue started international services to Havana and Mexico City in 2018. Delta also expanded their Caribbean services to Aruba (2018) and added three new European destinations, Dublin (2017), Edinburgh (2019), and Lisbon (2019).

7th

Greatest Number of Foreign Flag Carriers & Fastest Growing Large Hub Airport in International Seats

Bolstered by these new services, Logan was the 7th fastest growing U.S. large hub airport in terms of international seats between July 2015 and July 2019, as shown in Exhibit 4-40. Logan currently also ranks 7th among U.S. large hubs in terms of the number of foreign carriers providing service, compared to its 11th position as a U.S. international gateway. The diversity of foreign carriers serving Boston gives its growing international passenger segments options to travel.

Exhibit 4-40: Growth of International Seats at U.S. Large Hub Airports and Number of Foreign Carriers Serving (July 2015 – July 2019)

Rank	Airport	Weekly International Seats (July) 2015	2016	2017	2018	2019	Seats Change ('15-'19)	CAGR ('15-'19)	Foreign Carriers Serving	Rank of Foreign Carriers Serving
1	Tampa - TPA	5,360	7,409	8,824	9,217	11,840	6,481	21.9%	7	18
2	Fort Lauderdale - FLL	63,261	67,277	88,948	103,949	109,462	46,201	14.7%	12	15
3	Salt Lake City - SLC	7,962	11,501	12,162	12,617	13,232	5,270	13.5%	2	27
4	Denver - DEN	23,496	25,464	30,227	35,785	38,502	15,006	13.1%	9	17
5	Portland - PDX	8,709	10,641	12,063	13,627	13,713	5,004	12.0%	5	21
6	Orlando - MCO	62,408	67,692	73,843	75,244	89,541	27,134	9.4%	21	9
7	**Boston - BOS**	**78,739**	**94,665**	**98,608**	**99,513**	**110,114**	**31,375**	**8.7%**	**31**	**7**
8	San Francisco - SFO	145,962	161,204	179,940	185,409	196,837	50,875	7.8%	42	4
9	Minneapolis - MSP	29,242	33,744	32,488	33,803	37,104	7,862	6.1%	6	19
10	Seattle/Tacoma - SEA	59,842	62,711	64,619	70,668	75,907	16,065	6.1%	21	9
11	San Diego - SAN	9,812	11,605	12,697	12,667	12,327	2,515	5.9%	5	21
12	Dallas/Fort Worth - DFW	104,267	107,161	115,040	113,229	130,370	26,103	5.7%	13	14
13	New York - EWR	158,942	162,762	169,569	186,491	192,589	33,647	4.9%	25	8
14	Los Angeles - LAX	272,322	295,050	323,675	333,439	320,513	48,191	4.2%	54	2
15	Washington - IAD	100,628	107,492	110,192	108,153	117,248	16,619	3.9%	32	6
16	Detroit - DTW	42,306	42,879	44,212	47,949	49,008	6,702	3.7%	5	21
17	Chicago - ORD	164,005	166,828	175,078	182,926	187,889	23,885	3.5%	37	5
18	New York - LGA	26,461	25,231	26,425	28,306	30,080	3,619	3.3%	2	27
19	Charlotte - CLT	46,205	46,754	48,339	47,220	52,247	6,042	3.1%	4	25
20	Las Vegas - LAS	39,543	39,256	40,299	43,530	44,409	4,867	2.9%	16	12
21	Atlanta - ATL	140,359	144,350	150,207	154,434	153,957	13,599	2.3%	11	16
22	Baltimore - BWI	14,830	15,759	15,501	19,791	16,237	1,406	2.3%	3	26
23	New York - JFK	416,423	437,413	446,400	444,312	448,789	32,366	1.9%	67	1
24	Miami - MIA	256,488	254,479	256,295	248,173	255,295	(1,192)	-0.1%	45	3
25	Philadelphia - PHL	63,983	60,714	56,940	62,418	63,598	(385)	-0.2%	6	19
26	Honolulu - HNL	62,354	62,743	67,907	64,788	60,637	(1,717)	-0.7%	16	12
27	Houston - IAH	147,913	146,218	141,293	139,418	142,973	(4,940)	-0.8%	21	9
28	Chicago - MDW	11,362	10,931	11,984	11,112	9,938	(1,425)	-3.3%	2	27
29	Washington - DCA	5,801	4,930	5,154	5,222	5,031	(770)	-3.5%	1	30
30	Phoenix - PHX	23,354	18,491	20,385	20,518	20,160	(3,194)	-3.6%	5	21
	Top Large Hubs	**2,592,338**	**2,703,357**	**2,839,314**	**2,913,930**	**3,009,545**	**417,207**	**3.8%**		

Note: Excludes the Caribbean. Ranked by '15-'19 percent average annual growth in weekly seats. July 2019 is referencing advance schedules. Net changes may not sum due to rounding of average calculations.
Source: Innovata Schedules.

4.4.4.3 New Technology Aircraft for Long-Haul International Service

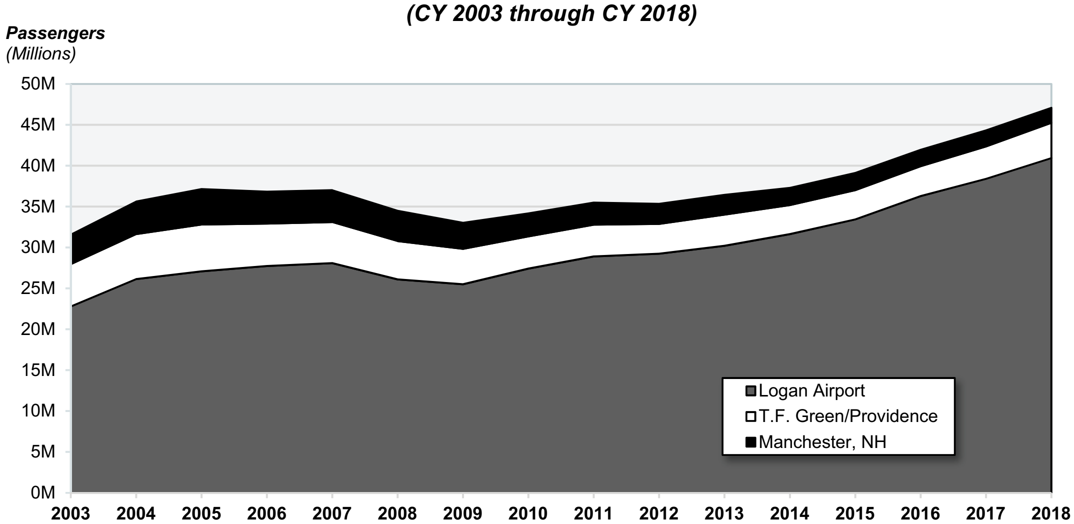
The introduction of new technology aircraft will continue to be a key enabler of new international services at Logan and around the world. New long-range, fuel efficient aircraft with fewer seats have made previously uneconomical long-haul routes possible. Long-range aircraft such as the Boeing B777 are sometimes too large for carriers to profitably serve non-hub markets that do not benefit from significant feeder traffic. However, the Boeing B787 and Airbus A350, which offer fewer seats and greater fuel efficiency, allow carriers to bypass connecting hubs, thereby creating significant opportunities for international market pairings that do not include two hubs, such as the service offered by Hainan Airlines from Boston to Beijing and Shanghai. Use of new fuel-efficient aircraft will continue to allow airlines to open up new nonstop routes, introducing more service to markets that may lack significant feeder traffic from a hub carrier, like Boston Logan Airport. Even looking at smaller aircraft like the new A220s and A321 LRs will disrupt markets as they will be able to feed more frequencies while operating with lower cost margins.

Logan Airport received its first regularly scheduled Airbus A380 service by British Airways in March 2017. The 489-seat Airbus A380 is the largest aircraft serving Logan and as of July 2019, is being used by British Airways for Boston-London service daily and by Emirates for its daily service to Dubai, which commenced June 2019. Given its large seat capacity available per departure, the A380 can provide fewer operational turns per market pair on high density international routes like London, with respect to airline fleet mixes.

4.4.4.4 Competing New England Regional Airports

In the late 1990s, secondary airports that provided overlapping service with Logan Airport in the Greater Boston region – T.F. Green/Providence and Manchester – began to gain market share. T.F. Green and Manchester were seen as attractive alternatives to Logan Airport, given increasing service levels at the two airports including low-fare service introduced by Southwest, as well as the major Central Artery / Tunnel construction project, which hampered access to Logan. As shown in Exhibit 4-42, T.F. Green and Manchester saw an increase in their share of regional passengers from 11 percent in 1995 to approximately 27 percent in 2005. However, their shares have stabilized at around 13 percent regional share for T.F. Green and Manchester in the last few years.

Exhibit 4-41: Passenger Shares at New England Regional Airports and Logan Airport (CY 2003 through CY 2018)



Source: Massport, T.F. Green and Manchester-Boston annual traffic reports.

Over the past decade, the growth of LCC services at Logan and industry wide airline retrenchment from smaller, secondary markets have caused a substantial shift in the market dynamics among Logan, T.F. Green and Manchester. The challenging operating environment, including volatile fuel prices and economic recession, resulted in airlines cutting services at secondary markets across the nation. Passenger traffic at the secondary airports declined at an average annual rate of 5.8 percent between 2008 and 2013 and then stabilized, only dropping by 0.3 percent per year from 2013 to 2018 (as shown in Exhibit 4-42). As travel choices became more limited at the secondary airports and the airports lost their low-fare advantage, Logan increased its share of the regional market from 76 percent in 2008 to 87 percent in 2018.

Exhibit 4-42: Passenger Activity at New England Regional Airports and Logan Airport (In Millions)

Airport	Airport Passengers					Compounded Annual Growth			
	1995	2000	2008	2013	2018	CY95/00	CY00/08	CY08/13	CY13/18
Logan Airport	24.10	27.73	26.10	30.22	40.94	2.8%	-0.8%	3.0%	6.3%
T.F. Green/Providence	2.17	5.43	4.69	3.80	4.30	20.1%	-1.8%	-4.1%	2.5%
Manchester, NH	0.90	3.17	3.72	2.42	1.85	28.6%	2.0%	-8.2%	-5.3%
Total	**27.17**	**36.33**	**34.51**	**36.44**	**47.09**	**6.0%**	**-0.6%**	**1.1%**	**5.3%**
Boston Logan Airport	**24.10**	**27.73**	**26.10**	**30.22**	**40.94**	**2.8%**	**-0.8%**	**3.0%**	**6.3%**
Providence / Manchester Combined	**3.07**	**8.60**	**8.41**	**6.23**	**6.15**	**22.9%**	**-0.3%**	**-5.8%**	**-0.3%**
Boston Logan Share	**88.7%**	**76.3%**	**75.6%**	**82.9%**	**86.9%**				
Providence / Manchester Share	**11.3%**	**23.7%**	**24.4%**	**17.1%**	**13.1%**				

Source: Massport, T.F. Green and Manchester-Boston annual traffic reports.

In the past two years, T.F. Green has been successful in attracting a number of new international services. Norwegian Air began operating low-cost flights from T.F. Green Airport, introducing service to Ireland and Scotland in the summer of 2017. By 2019, however, T.F. Green lost the service to Ponta Delgada, Cabo Verde, and Scotland previously flown by Azores Airlines, TACV, and Norwegian, respectively. The only international markets currently served from T.F. Green with nonstop service are Dublin and Toronto[84] as of July 2019 schedules.

4.5 Aircraft Operations

There were approximately 424,000 airline operations (including commercial and general aviation) at Logan during 2018, up 5.6 percent from the previous year (Exhibit 4-43). Since 2001, aircraft operations have fluctuated from a high of 488,000 in 2000 to a low of 345,300 in 2009. The sharp decline in aircraft operations reflects airline capacity cuts and aircraft upgauging in response to economic downturns, industry consolidation, changes in operating strategy, the withdrawal of the operating entity American Eagle (renamed Envoy Air) from Logan and changes in the aircraft fleet. While aircraft operations increased by 5.6 percent last year, Airport passengers grew by 6.6 percent, showing that the on-going trend of increasing average aircraft size and passenger load factors at Logan continued.

Prior to 2000, domestic regional carrier operations were the fastest growing segment of aircraft activity, averaging increases of 4.9 percent annually between 1970 and 2000. International operations grew at a similarly fast pace of 3.2 percent per year, while domestic large jet operations grew by just 0.9 percent per year over the same period. Since 2000, the domestic regional segment has experienced an average decline of 4.1 percent per year, compared to increases of approximately 1.0 and 0.3 percent per year for international operations and domestic large jet operations, respectively. The sharp decrease in regional carrier operations can be attributed to RJs replacing smaller turboprops at the beginning of the decade. More recently, RJs have been falling out of favor due to newer technologies being introduced on narrowbody jet aircraft (e.g., A220) on domestic segments.

[84] Air Canada commenced service in May 2018.

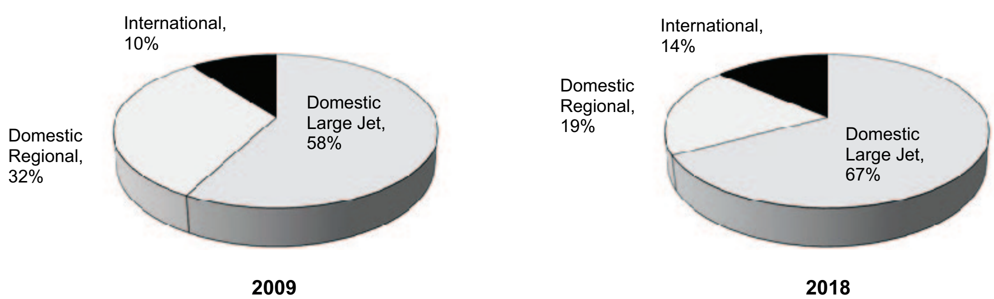
Exhibit 4-43: Historical Aircraft Operations at Boston Logan Airport (CY 1970 to 2018)

Calendar Year	Aircraft Takeoffs and Landings\1					Calendar Year	Aircraft Takeoffs and Landings\1				
	Domestic Large Jet\2	Domestic Regional	Int'l	General Aviation	Total		Domestic Large Jet\2	Domestic Regional	Int'l	General Aviation	Total
1970	189,192	37,800	17,599	N/A	244,591	2010	210,194	94,193	33,574	14,682	352,643
1980	178,686	60,623	18,858	N/A	258,167	2011	216,502	88,837	35,418	28,230	368,987
1990	223,955	144,179	31,458	24,976	424,568	2012	208,364	80,220	38,171	28,114	354,869
2000	248,555	159,025	45,183	35,233	487,996	2013	216,343	80,356	37,958	26,682	361,339
2005	205,548	132,169	38,697	32,652	409,066	2014	220,324	77,087	39,970	26,416	363,797
2006	212,011	126,378	36,286	31,444	406,119	2015	231,378	70,732	42,654	28,166	372,930
2007	210,944	120,503	39,458	28,632	399,537	2016	241,795	68,608	50,039	30,780	391,222
2008	199,514	111,964	36,306	23,820	371,604	2017	248,928	69,139	52,184	31,120	401,371
2009	192,356	106,507	34,201	12,242	345,306	2018	264,217	75,188	53,679	30,940	424,024
Average Annual Growth						**Percent Change Over Prior Year**					
1970-80	-0.6%	4.8%	0.7%	-	0.5%	2013	3.8%	0.2%	-0.6%	-5.1%	1.8%
1980-90	2.3%	9.1%	5.3%	-	5.1%	2014	1.8%	-4.1%	5.3%	-1.0%	0.7%
1990-00	1.0%	1.0%	3.7%	3.5%	1.4%	2015	5.0%	-8.2%	6.7%	6.6%	2.5%
2000-13	-1.1%	-5.1%	-1.3%	-2.1%	-2.3%	2016	4.5%	-3.0%	17.3%	9.3%	4.9%
2013-18	4.1%	-1.3%	7.2%	3.0%	3.3%	2017	3.0%	0.8%	4.3%	1.1%	2.6%
2000-18	0.3%	-4.1%	1.0%	-0.7%	-0.8%	2018	6.1%	8.7%	2.9%	-0.6%	5.6%

\1 Includes general aviation operations.
\2 Includes charter operations.
Note: Operations include arrivals and departures. International operations include scheduled and charter operations for U.S. certificated, U.S. regional, and foreign flag carriers.
Source: Massport.

Exhibit 4-44 below shows the change in the share of aircraft operations by segment at Logan between 2011 and 2018. Domestic large jet operations accounted for 67 percent of total aircraft operations at Logan in CY 2018, up from 64 percent in 2011. Domestic regional carrier operations accounted for 19 percent of Logan operations in 2018, down from 26 percent in 2011 and a historical peak share of 43 percent in the 1990s. Logan's international services have increased substantially over the past seven years, accounting for 14 percent of total operations in 2018, up from 10 percent in 2011.

Exhibit 4-44: Aircraft Share of Operations at Logan (CY 2009 vs. CY 2018)



Source: Massport. Excludes general aviation passengers.

As illustrated in Exhibit 4-45, the average number of passengers per commercial airline operation at Logan increased from 61 passengers in 2000 to approximately 104 passengers in 2018. In the last five years, the average number of passengers per commercial airline operation grew by approximately 3.0 percent from 90 to 104 passengers. This trend reflects the airlines' continued focus on maintaining high load factors, more effectively assigning appropriately sized aircraft to routes and fleet up-gauging. Regional carriers at Logan have increased average aircraft sizes and nearly doubled the average passengers per operation from 14 in 2000 to 29 in 2018.

Domestic large jet carriers are operating at record high load factors and replacing older aircraft models with newer, denser, and slightly larger ones. As a result, domestic large jet carriers at Logan have increased the average number of passengers carried per flight from 84 in 2000 to 118 in 2018. The average number of passengers per international flight has also grown from approximately 100 in 2000 to 141 in 2018 given the utilization of widebody aircraft such as the Airbus A380 and Boeing B787 flown by foreign carriers (such as Norwegian, Emirates, and British Airways).

Exhibit 4-45: Trend in Average Passengers per Operation at Logan (CY 1970 to 2018)

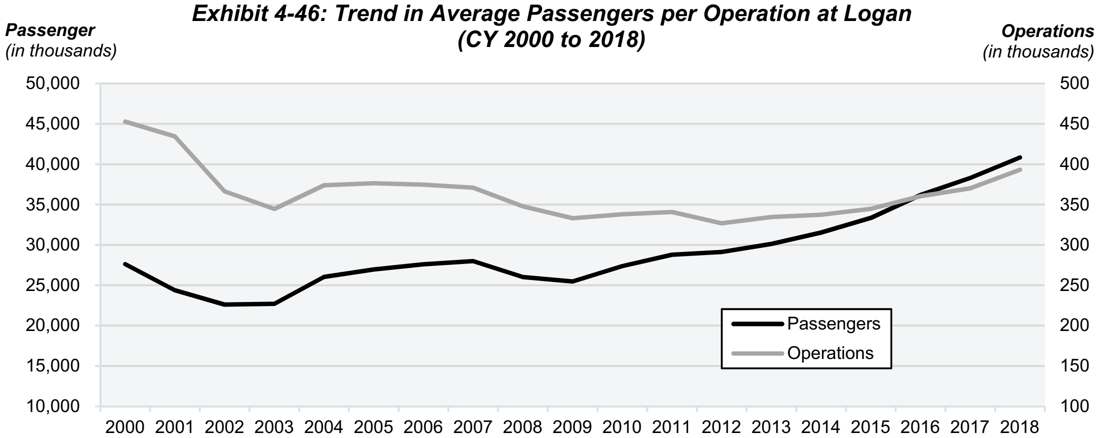
	Average Passengers Per Operation \1			
Calendar Year	Domestic Large Jet\2	Domestic Regional	Int'l	Total
1970	43.4	7.2	52.1	38.4
1980	67.7	7.7	114.5	57.0
1990	80.2	10.3	106.8	57.1
2000	84.2	13.7	99.9	61.0
2005	97.7	20.0	109.5	71.6
2006	98.4	21.3	111.6	73.7
2007	99.9	22.9	105.3	75.5
2008	97.4	23.1	109.5	74.8
2009	99.7	24.3	108.1	76.5
Average Annual Growth				
1970-1980	4.6%	0.7%	8.2%	4.0%
1980-1990	1.7%	2.9%	-0.7%	0.0%
1990-2000	0.5%	2.9%	-0.7%	0.7%
2000-2013	2.0%	4.8%	1.4%	3.0%
2013-2018	1.5%	3.0%	3.4%	2.9%
2000-2018	1.9%	4.3%	1.9%	3.0%

	Average Passengers Per Operation \1			
Calendar Year	Domestic Large Jet\2	Domestic Regional	Int'l	Total
2010	101.7	24.5	109.7	81.0
2011	104.0	26.1	111.9	84.5
2012	108.9	25.7	114.8	89.1
2013	108.9	25.1	119.8	90.0
2014	111.2	26.4	124.9	93.5
2015	112.3	26.0	129.7	96.7
2016	115.2	25.1	131.6	100.4
2017	117.0	28.5	138.0	103.4
2018	117.6	29.1	141.3	103.9

\1 Excludes general aviation passengers.
\2 Includes charter passengers.
Source: Massport.

As illustrated in Exhibit 4-46, since 2000, carriers have been able to increase passenger traffic while reducing operations at Logan Airport. This reflects the trend of aircraft upgauging and airlines continuing to focus on high load factors.

Exhibit 4-46: Trend in Average Passengers per Operation at Logan (CY 2000 to 2018)



Note: Excludes general aviation passengers; Includes charter passengers.
Source: Massport.

4.6 Cargo Traffic

Logan Airport was the 21st largest U.S. airport in terms of cargo volume, including mail, for the year ended September 2018 (Exhibit 4-47). Of the top 30 airports based on cargo volume, 11 are primary or regional sorting hubs for all-cargo carriers.[85] If all-cargo airline hubs are excluded, Logan ranks as the 10th largest airport in the nation in terms of cargo volume.

Exhibit 4-47: Top U.S. Airports Ranked by Cargo Volume (YE 3Q 2018)

Rank YE 3Q 18	Rank YE 3Q 17	Airport	Total Cargo (Tons)	5-Year CAGR	Rank YE 3Q 18	Rank YE 3Q 17	Airport	Total Cargo (Tons)	5-Year CAGR
1	1	Memphis - MEM	4,716,988	1.6%	16	15	Oakland - OAK	662,089	3.7%
2	2	Louisville - SDF	2,857,695	3.5%	17	17	Philadelphia - PHL	560,048	3.8%
3	4	Anchorage - ANC	2,701,378	10.9%	18	18	Houston - IAH	557,829	4.1%
4	3	Los Angeles - LAX	2,482,982	5.5%	19	19	Seattle/Tacoma - SEA	474,310	7.6%
5	5	Miami - MIA	2,090,093	1.7%	20	20	Phoenix - PHX	380,321	6.2%
6	6	Chicago - ORD	1,902,552	7.3%	**21**	**21**	**Boston - BOS**	**373,554**	**6.1%**
7	8	Cincinnati - CVG	1,509,395	20.5%	22	22	Washington - IAD	333,327	3.2%
8	7	New York - JFK	1,420,715	1.6%	23	30	Chicago - RFD	318,935	19.9%
9	9	Indianapolis - IND	1,032,082	-0.5%	24	23	Denver - DEN	309,536	3.2%
10	10	New York - EWR	922,709	4.0%	25	25	Portland - PDX	275,975	5.0%
11	11	Dallas/Ft. Worth - DFW	891,253	7.2%	26	24	Minneapolis - MSP	266,650	2.9%
12	12	Atlanta - ATL	777,361	2.9%	27	27	Orlando - MCO	264,393	8.4%
13	14	Ontario - ONT	736,708	9.7%	28	26	Detroit - DTW	258,999	2.0%
14	13	Honolulu - HNL	709,505	4.2%	29	31	San Juan - SJU	249,919	10.0%
15	16	San Francisco - SFO	664,121	12.3%	30	28	Salt Lake City - SLC	222,360	2.9%

Source: U.S. DOT, T-100 Database.

Seven all-cargo airlines had operations at Logan in 2018 (Exhibit 4-47). In addition to the all-cargo carriers serving the Airport, passenger airlines also provide belly cargo capacity at the Airport and numerous charter carriers also transport cargo to and from Logan.

[85] Includes FedEx hubs (Memphis, Miami, Anchorage, Indianapolis, Newark, and Oakland); UPS hubs (Louisville, Dallas/Fort Worth, Philadelphia, Rockford (IL), and Ontario (CA)); and DHL superhub (Cincinnati).

Exhibit 4-48: All Cargo Airlines Operating at Logan (CY 2018)

All Cargo Airlines	
ABX Air (as DHL)	Mountain Air Cargo (under FedEx)
Atlas Air (as DHL)	UPS
CargoLux	Wiggins Airways (under FedEx)
FedEx	

Source: Massport, U.S. DOT, T-100 Database via Airline Data, Inc.

In CY 2018, Logan Airport handled 704 million pounds of cargo (freight plus small package/express), excluding mail. (See Exhibit 4-49) Since 2000, total non-mail cargo volumes at Logan have fallen at an average annual rate of 1.1 percent. Both cargo market segments, express/small package and heavy freight, have been declining as a result of slower economic growth, greater use of trucking by the integrators,[86] the loss of 757 capacity on transcontinental passenger airline routes, and the widespread use of electronic document delivery. In 2018, freight volume at Logan increased by 1.5 percent year-over-year compared to a 14.8 percent growth the year prior, and express/small packages cargo volume increased by 5.4 percent, resulting in an overall cargo volume increase of 3.6 percent. The recent five-year average annual growth in cargo has been attributed to continued growth trends in e-commerce seen across the nation and globe. E-commerce retailers fly cargo to their respective U.S. hubs and then transfer those packages/freight onto passenger planes as belly cargo freight, which passenger planes then fly into Boston Logan. Between 2013 and 2018, total cargo has grown an average of 5.5 percent per year.

Exhibit 4-49: Historical Trends in Cargo Volume (CY 1990 to CY 2018)

Year	Total Pounds \1 (000s)	Annual Percent Change: Express/Small Packages	Freight	Total Cargo\1
1990\2	633,435	-	-	-
2000	852,347	1.7%	5.8%	3.4%
2005	741,517	-1.2%	-4.2%	-2.3%
2006	679,068	-10.7%	-4.5%	-8.4%
2007	632,450	-4.5%	-10.7%	-6.9%
2008	587,772	-4.7%	-11.2%	-7.1%
2009	517,557	-15.0%	-6.1%	-11.9%
2010	546,379	4.0%	8.3%	5.6%
Average Annual Growth				
1990-2000		6.7%	-0.3%	3.0%
2000-2013		-2.8%	-4.4%	-3.5%
2013-2018		3.5%	8.6%	5.5%
2000-2018		-1.1%	-1.0%	-1.1%

Year	Total Pounds \1 (000s)	Annual Percent Change: Express/Small Packages	Freight	Total Cargo\1
2011	529,213	-2.0%	-5.1%	-3.1%
2012	531,831	-1.7%	4.2%	0.5%
2013	538,193	2.2%	-0.4%	1.2%
2014	585,460	6.7%	12.2%	8.8%
2015	575,782	-5.8%	4.8%	-1.7%
2016	616,934	4.9%	10.3%	7.1%
2017	679,408	6.7%	14.8%	10.1%
2018	704,201	5.4%	1.5%	3.6%

\1 Includes freight and express/small packages; excludes mail.
\2 Before 1991, freight and express/small packages were not reported individually.
Source: Massport.

[86] Unlike traditional all-cargo airlines, which only provide air services for packages and freight shipments, the integrated cargo carriers (FedEx and UPS) provide door-to-door delivery including the air and ground portions of a cargo shipment.

4.7 General Aviation

Annual general aviation ("GA") activity at Logan Airport is shown in Exhibit 4-50. In 2018, Logan Airport accommodated more than 30,900 general aviation operations. While the larger general aviation sector encompasses a broad range of activity from pilot training to recreational and corporate use, the GA activity at Logan consists primarily of business and corporate aviation.

Exhibit 4-50: General Aviation Activity at Logan Airport (CY 1990 to CY 2018)

Year	General Aviation Operations	Annual Percent Change
1990	24,976	-
2000	35,233	-
2005	32,652	4.5%
2006	31,444	-3.7%
2007	28,632	-8.9%
2008	23,820	-16.8%
2009	12,242	-48.6%
2010	14,682	19.9%
Average Annual Growth		
1990-1995		-0.9%
1990-2000		3.5%
2000-2013		-2.1%
2013-2018		3.0%
2000-2018		-0.7%

Year	General Aviation Operations	Annual Percent Change
2011	28,230	92.3%
2012	28,114	-0.4%
2013	26,682	-5.1%
2014	26,416	-1.0%
2015	28,166	6.6%
2016	30,780	9.3%
2017	31,120	1.1%
2018	30,940	-0.6%

Source: Massport.

GA activity at Logan closely follows national trends in the use of private jet transportation for business/corporate use and personal travel. General aviation operations fell sharply in 2008 and 2009 following the global credit crisis, the economic recession in the U.S., and a public backlash against corporate use of private air transportation that prompted many businesses to limit their use of general aviation. After bottoming out in 2009 at 12,200 operations, GA activity began to recover in 2010. Between 2013 and 2018, GA operations at Logan increased at an average annual rate of 3.0 percent. The sharp drop in fuel prices in 2015 helped boost GA activity, with GA operations growing by 6.6 percent in 2015 and 9.3 percent in 2016 after a few years of decline previously. Low fuel costs made it economical for GA operators to fly at the time.

4.8 Massport's Ability to Ensure Efficient Gate Utilization

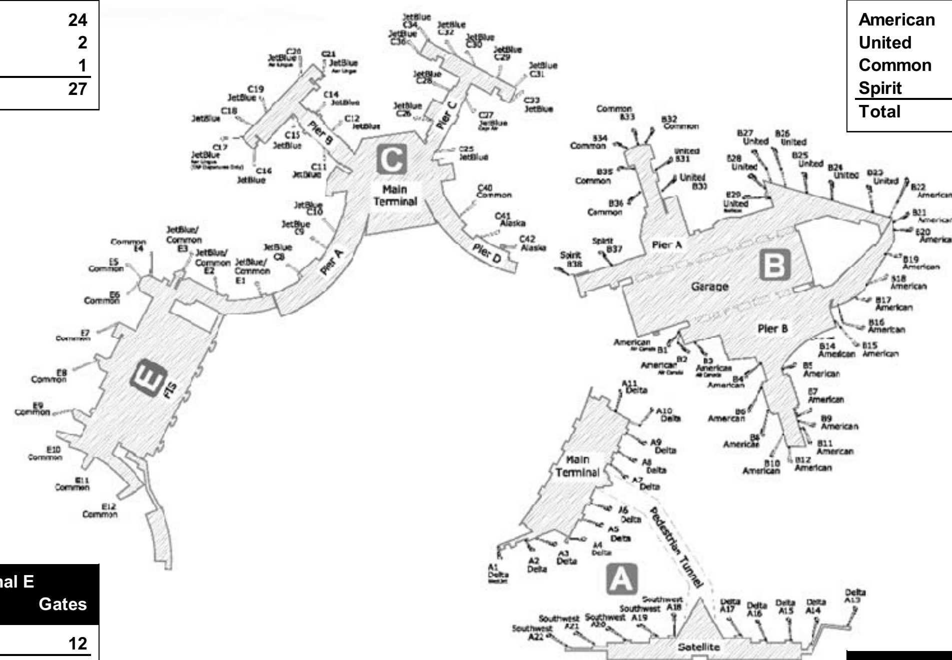
Massport has implemented several policies and tools that allow for effective reallocation of the Airport's facilities. These include an Airport-wide Preferential Gate Use Policy, greater use of short-term leases and gate recapture as well as forced sublet provisions that have been incorporated into all new long-term leases at the Airport. Massport has successfully used these policies during carrier bankruptcies and mergers to reassign underused gates quickly.

This section summarizes the current allocation of gates at Logan (see Exhibit 4-51) and the ability of Massport to exert control over underutilized facilities and ensure optimum utilization of the Airport's facilities.

Exhibit 4-51: Logan Airport Terminal Layout and Contact Gates by Leaseholders

Terminal C	
Carrier	**Gates**
jetBlue	24
Alaska	2
Common	1
Total	27

Terminal B	
Carrier	**Gates**
American	21
United	9
Common	5
Spirit	2
Total	37



Terminal E	
Carrier	**Gates**
Common	12
Total	12

Terminal A	
Carrier	**Gates**
Delta	16
Southwest	5
Total	21

Note: As of March, 2019.
Source: Massport.

Exhibit 4-52 presents leaseholders with Massport by terminal. Delta currently leases 16 gates in Terminal A and Southwest leases five gates in Terminal A[87]. American currently leases 21 contact gates at Terminal B and subleases three of these gates to Air Canada. Other leaseholders in Terminal B include Spirit (two gates), Common-use (five gates), and United (nine gates). In Terminal C, JetBlue leases 24 gates, subleasing one of these gates to Cape Air. TAP Portugal (departures only) operates at one gate at Terminal C pursuant to a Facility Use Agreement, while Aer Lingus international operates at three gates for departures and arrivals. U.S. Customs and Border Protection ("CBP") pre-clearance is available prior to departure from Dublin and Shannon, which allows for a direct arrival process at Logan, providing easy same terminal connections for Aer Lingus with its partner, JetBlue. Alaska leases two gates in Terminal C, and one gate is common use. All gates in Terminal E are common use, which has allowed simpler reconfiguration to accommodate new international carriers. Recently, Massport has made JetBlue a preferential gate holder of the common use Terminal E gates designated E1, E2, and E3 between 12am and 12pm, which enables the Authority to better accommodate JetBlue's peak operations at Terminal C during that time period (reference Exhibit 4-53, in the morning and afternoon).

[87] Delta will consolidate all of its operations in Terminal A, backfilling the five Southwest gates in the Satellite terminal starting calendar year 2019; Southwest will vacate and initially lease five gates in Terminal B, Pier A, which are now marked as "Common".

Exhibit 4-52: Logan Airport Airline Operators by Terminal (as of April 2019)

Terminal Building	Lease Holders with Massport	Other Carriers Operating in Terminal	
A	Delta Southwest	WestJet[1]	
B	American [2] United Spirit	Air Canada [3] Boutique Air	
C	JetBlue [4] Alaska	Aer Lingus [5] Cape Air [6] Silver Airways	Sun Country TAP Air Portugal [7]
E		Air France Alitalia American [8] Avianca Azore Airlines (SATA) British Airways Cathay Pacific Cabo Verde Airlines Copa Airlines Delta [8] EL AL Emirates Frontier Hainan Hawaiian Iberia Icelandair	Japan Airlines JetBlue [8/9] KLM Korean Air LATAM Level Lufthansa Norwegian Porter Qatar Scandinavian Sun Country Airlines SWISS TAP [8] Turkish Airlines Virgin Atlantic

[1] One contact gate subleased from Delta.
[2] American subleases three gates to Air Canada.
[3] Three contact gates subleased from American; Air Canada includes Air Canada Jazz.
[4] JetBlue subleases one gate to Cape Air. It also allows Aer Lingus to operate out of three of its gates pursuant to a Facility Use Agreement and allows TAP to operate out of one of its gates pursuant to a Facility Use Agreement, for departures only.
[5] Operates from three of JetBlue's gates pursuant to a Facility Use Agreement.
[6] Subleased from JetBlue. Cape Air provides ramp operations only from its gate in Terminal C.
[7] Operates from one of JetBlue's gates pursuant to a Facility Use Agreement, departures only.
[8] International arrivals only.
[9] JetBlue is a preferential common-use gate user, operating between midnight to noon.

Source: Massport.

4.8.1 Current Gate Utilization at Logan Airport

Over the past decade (CY 2009 to CY 2018), Logan has seen a 14.2 percent growth in annual air traffic movements ("ATMs"), with minimal expansion of aircraft gates at the Airport. The composition of this activity, however, has been evolving. International ATM's have grown by 47.8 percent during this period, while large domestic jet ATMs have grown by 32.4 percent over this period. The consequence of this trend is that the gates at Boston Logan airport are highly utilized, particularly during the peak periods of the day. With growing international demand at Boston, a source from Massport indicated that accommodating of transatlantic expansion is becoming more and more challenging due to the demand for resources at international Terminal E during the evening peak period. This is especially true for gates and check-in facilities during the busy summer season. As shown in the chart below, aircraft turns (which is defined as an aircraft arrival and departure) are averaging above seven turns per day per contact gate at terminals A and C, and above three turns per day per contact gate at Terminal E, which handles all international arrivals.[88]

Exhibit 4-53: Average Day Peak Month Gate Utilization at Boston Logan Airport by Terminal, July 2018

Hours of Operation	Terminal A	Terminal B	Terminal C	Terminal Combined (A+B+C)	Terminal E
Morning (5am-12pm)	3.3	2.3	3.5	2.9	0.4
Afternoon (12pm-5pm)	2.0	1.4	2.3	1.8	0.3
Evening (5pm-2am)	2.1	1.3	2.7	2.0	2.8
Average Full Day	**7.4**	**5.0**	**8.5**	**6.7**	**3.5**
Number of Gates *(as of March 2019)*	**21**	**37**	**27**	**85**	**12**

Note: Gate utilization metric calculates average number of departure turns per contact gate at respective terminals. Combined is a weighted average, based on number of gates available.
Source: Massport, Innovata Schedules, ICF Analysis.

The peak periods for domestic aircraft activity during a typical weekday are in the morning (between 5am and 11am) and in the early evening (between 4pm and 8pm), whereas the peak period for international aircraft activity is between 5pm and 11pm. The current level of gate utilization at Logan is quite high based on ICF's opinion and analysis compared to the historical experience of the Airport. The ability for Logan to meet its future growth will require:

(1) an increased level of gate utilization, particularly at the domestic terminals,

(2) continued airline upgauging to larger aircraft, with greater seat capacity, and

(3) expansion of international gates (seven new gates are part of Massport's proposed Capital Plan).

Although Massport cannot control the seat capacities mentioned in clause 2 above, the Authority has greater control over gate usage and assignments to airlines. To this end, Massport is moving to balance aircraft operations among the terminals to optimize gate utilization. Southwest will be moving from Terminal A to Terminal B. As previously mentioned, JetBlue is utilizing several gates in Terminal E during the slow period before 12pm, and Frontier has commenced daytime operations at Terminal E. The projects in the Authority's Capital Program are expected to help further mitigate and reallocate this growing demand, see Section 4.9 below.

4.8.2 Airport-Wide Preferential Gate Use Policy

Massport's preferential use policy is applicable to all gates at Logan Airport. Under conditions specified in the policy, Massport may schedule arrivals and departures at a gate by carriers other than the tenant for any period that the tenant is not using the gate. The tenant carrier must permit the carrier being accommodated under the policy to use the hold room, loading bridge, baggage claim and other related facilities required for the functional use of the gate, and may assess reasonable fees for such use. If a tenant carrier fails to accommodate a carrier under the terms of the preferential use policy, then Massport may convert the gate to a common use gate.

Massport prefers to lease space at the Airport on a short-term basis, which allows Massport the requisite flexibility to ensure the Airport's limited gate resources are optimally used. In the past, Massport has granted longer term

[88] Terminal E has the only Federal Inspection Facility ("FIS") at the airport and aircraft arriving from all international destinations that do not have U.S. CBP pre-clearance must be handled through this terminal.

leases to carriers that have made significant capital investments in terminal facilities. Currently, only American holds a long-term lease with Massport for 21 gates in Terminal B (eight to expire in June 2021; 13 to expire in September 2023). Previously, American had another lease agreement for seven gates in Terminal B – Pier A, which expired on April 1, 2015. Of those seven gates, five were subsequently turned into common-use gates and are expected to be leased to Southwest Airlines commencing in September 2019. The remaining two are now leased to United (as of April 2019). The Authority entered into a new lease with Delta for 16 gates in Terminal A in January 2017, which lease has a term of one year, renewable on a year-to-year basis. Massport's JetBlue lease was entered into on March 18, 2005, with an effective date of May 1, 2005 and an original term of five years with 20 automatic one-year extensions thereafter. Massport's United lease was entered into on May 1, 2014 with an original term of one year. The lease is renewable on a year-to-year basis.

In order to ensure maximum utilization of the Airport's gates, Massport's lease agreements with Delta, American, and JetBlue contain language that allows Massport to regain control of leased gates should the airline tenants fail to meet certain utilization thresholds. These gate recapture provisions allow Massport to maximize the Airport's gate utilization by redistributing gates from carriers shrinking their operations at Logan to those wanting to expand. These leases also contain provisions that allow Massport to require the airlines to sublease a certain number of gates. Southwest, Spirit, and Alaska Airlines have monthly leases that do not contain "recapture" language, but give the Authority the right to terminate portions of the premises on 30-days' notice. Over time, Massport has been successful in securing more stringent gate recapture and forced sublet provisions.

4.8.3 Previous Experience Recapturing Underutilized Gates

Historical experience at Logan Airport demonstrates that gate space abandoned as the result of a major carrier retrenchment or bankruptcy is rapidly re-absorbed by other airlines. In such cases, Massport has assumed an active role in ensuring liquidity in underutilized capacity. In 2003, Northwest Airlines gave up two of its gates to satisfy the U.S. DOT's request that they relinquish gates at their hub airports and at Logan following its marketing agreement with Delta and Continental. The two gates relinquished by Northwest were leased to JetBlue for the start-up of their operations at Logan. In 2006, while in bankruptcy, Delta reaffirmed its lease for Terminal A and relinquished under-utilized gates to Massport. The former Delta gates that reverted to Massport control allowed Continental to relocate from Terminal C to Terminal A and allowed JetBlue to expand its operations at Logan. In 2009, Northwest merged its operations with Delta and relocated to Terminal A and United Airlines gave up two of its underutilized gates, which Massport subsequently re-let to JetBlue allowing for JetBlue's continued expansion at Logan. In 2014, U.S. Airways gave up two of its gates to satisfy the U.S. DOT's request that they relinquish two gates at Logan following its merger with American Airlines.[89]

4.9 Terminal Upgrades to Support Traffic Growth

Over the past decade, Logan Airport has welcomed approximately 15 million additional passengers through its doors, with largely the same terminal and landside footprint. The Airport has also seen international passenger volumes grow by 37 percent in the past three years.

In response to this growth, Massport has undertaken terminal improvement projects that have helped the Airport rationalize terminal and landside space, and address the current needs of airlines serving Logan Airport. The current five-year Massport Capital Program continues the upgrading and modernization the Airport needs in order to accommodate the continued underlying growth in demand for air travel in the Boston Market. Key elements of this program include the following projects:

(1) Adding seven new international gates to Terminal E, and expanding customs and immigrations processing capabilities;

(2) Redesigning and optimizing Terminal B to better serve the needs of airlines and passengers, and adding two new domestic gates to support the needs of future airline growth;

[89] These gates were subsequently leased to United.

(3) Providing post-security connectivity of the terminals on the airside. Airside connections between terminals B and C are currently planned; and

(4) Reconfiguring the roadway circulation system to improve ground access flow at the Airport.

Massport is continuing a major expansion of Terminal E, having already completed a direct post-security connection between Terminal C and E. Due to the rapid increase of international airline services at Logan Airport and continued growth in international passenger traffic, the planned Terminal E expansion will include the construction of seven new gates, increased connectivity for gates, more space for customs and immigration processing, and a direct pedestrian walkway to the MBTA Blue Line service, allowing passengers to conveniently access public transportation to travel to downtown Boston. The Airport expects to begin the new project in 2019 and expects construction to take four years (CY 2023/2024).

Terminal B primarily accommodates American Airlines and United Airlines. Following the merger of American Airlines and US Airways, the Authority assisted in accommodating the consolidation of American Airlines from 22 contact gates on Pier A and Pier B to 18 contiguous contact gates on Pier B only[90]. The completed optimization includes a new Pier B consolidated security checkpoint for American and its shuttle operations, a re-organization of the ticketing hall counters, kiosks and hold rooms, and improvements in the baggage handling with the new right size sloped plate baggage carousels. In fiscal year 2020, Southwest Airlines is expected to move from Terminal A into Terminal B and utilize the 5 gates in Pier A that are currently common use. The Authority intends to construct one additional gate in Terminal B and will also be adding another gate on Pier D in Terminal C.

In an effort to reduce ground traffic congestion to and from the Airport, the Authority is encouraging the use of High Occupancy Vehicle ("HOV") roadway modes. The Authority is undertaking a comprehensive Ground Transportation Plan (as referenced in Appendix A) to increase ridership on the Silver Line and Logan Express buses, which is expected to help alleviate traffic congestion.

The FY 2019-FY 2023 Capital Program also includes a variety of airside and landside projects that are expected to improve the operational efficiency and accommodation at Logan Airport as it expects greater demand of air passengers flying in and out of Boston. Such projects include airport parking capacity, HVAC[91] equipment replacement program, central heating plant upgrades, and runway/taxiway rehabilitations.

[90] American subleases an additional three contact gates in Pier B to Air Canada.
[91] Heating, Ventilation, and Air Conditioning.

5. REVIEW OF MASSPORT ACTIVITY FORECASTS

5.1 Introduction

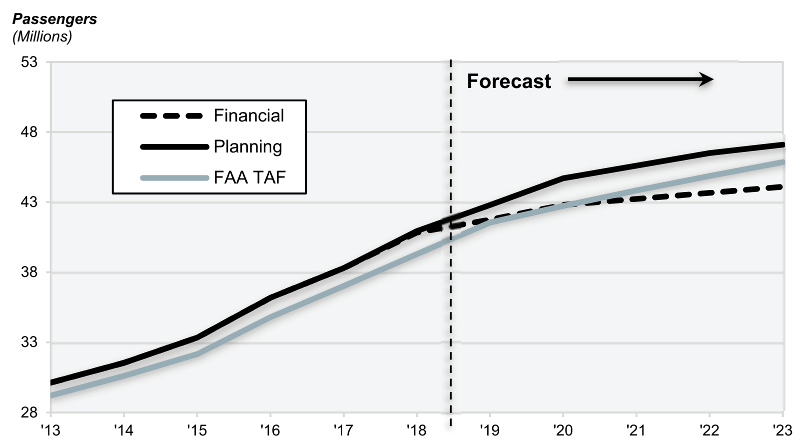
Massport utilizes two types of aviation activity forecasts to manage the future requirements of the Airport:

- The Massport planning forecast; and
- The Massport financial forecast.

The Massport planning forecast is used to anticipate future landside and airside infrastructure requirements at the Airport and to estimate the potential environmental impacts of future aviation activity. The Massport financial forecast, which is normally more conservative than the planning forecast, is used for financial planning purposes. This section summarizes and reviews Massport's existing forecasts for Logan Airport and considers the FAA's most recent projections for the Airport.

Forecast passenger levels for Logan Airport through 2023 are presented in Exhibit 5-1 below. Massport's financial and planning forecasts project passenger traffic at the Airport to reach approximately between 44.0 and 47.1 million over the next five years. The FAA Terminal Area Forecast (TAF) forecasts somewhat conservative growth compared to the short-term planning forecast, with the TAF projecting passenger traffic at the Airport to reach over 45.8 million in FY 2023.

Exhibit 5-1: Boston Logan Passengers Forecast (CY 2018 to CY 2023)



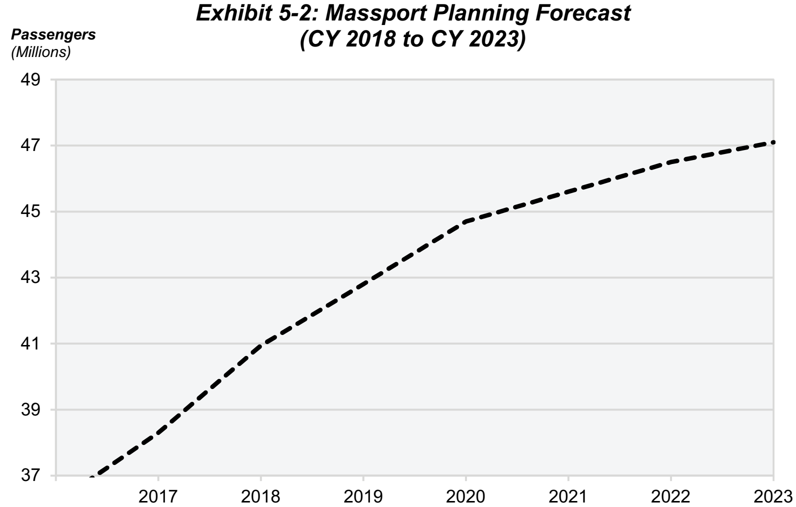
Notes: CAGR refers to compound annual growth rate; Massport's planning forecast is shown on a calendar year basis and includes general aviation passengers; Massport's financial forecast is shown on a fiscal year basis and excludes general aviation passengers; FAA TAF forecast is for Federal fiscal years ended September 30.

Sources: Massport. FAA Terminal Area Forecast 2018-2045, February 2019.

5.2 Massport Planning Forecasts

Massport uses short-term forecasts of Logan Airport activity to plan for facilities and operations and to assess environmental impacts. The current short-term (through FY 2023) planning forecast was finalized in January 2019 by InterVISTAS Consulting LLC. Sustained, strong growth at the Airport is expected over the period, based on a range of announced and anticipated increases by JetBlue, Delta, and Southwest, continued growth in international services from foreign-flag carriers as well as anticipated growth in the economy of the region. Under the long-term planning forecast, the Airport is projected to reach 47.1 million passengers by CY 2023. Massport uses this planning forecast as a tool to anticipate future airport capacity requirements and plan for the necessary infrastructure to accommodate projected air travel demand (see Exhibit 5-2).

Exhibit 5-2: Massport Planning Forecast (CY 2018 to CY 2023)



Note: Forecast includes general aviation passengers. Massport's planning forecast is for the calendar year.
Source: InterVISTAS Short-Term Forecast (January 2019).

5.3 Massport Financial Forecast

Massport's financial forecast, restated to reflect Massport's fiscal year, is summarized in Exhibit 5-3. The Authority's financial forecast projects annual passengers for the next five years, and is intended to present a conservative perspective of Massport's financial condition. This forecast is used as a key input into the Authority's financial planning and financial modeling to analyze the Authority's ability to support operations, borrow additional funds to pay for additional capacity and meet debt service covenants.

Massport's financial forecast uses actual passenger traffic through March 2019 and then assumes budgeted data for the remainder of FY 2019, resulting in an overall growth rate for FY 2019 of 6.0 percent. For FY 2020, the financial forecast assumes annual growth of 2.5 percent, followed by 1.0 percent for FY 2021 onward. Overall, between FY 2019 and FY 2023, passenger traffic is forecast to grow at an average annual growth rate of 2.9 percent, and will result in the Airport reaching a forecast passenger volume of approximately 44.1 million in FY 2023. The relatively high annual average rate between FY 2019 and FY 2023 is driven to a considerable degree by the high passenger growth rate of 6.0 percent anticipated for the current fiscal year (FY 2019).

Exhibit 5-3: Massport Financial Forecast (FY 2018 to FY 2023)

Year	Annual Passengers Total (in thousands)	Change
Actual		
2018	39,394	
Forecast		
2019	41,757	6.0%
2020	42,801	2.5%
2021	43,229	1.0%
2022	43,662	1.0%
2023	44,098	1.0%
Forecast AAGR:		
2019-2023	1.4%	

Note: Forecast excludes general aviation passengers. Massport's financial forecast is for the fiscal year ended June 30.
Source: Massport.

5.4 FAA Aviation Forecasts

The FAA has developed extensive aviation forecasting models that are used to project passengers and aircraft operations for the U.S. airline industry and for individual airports. The FAA develops its national forecast annually. In March 2017, the FAA released its annual industry forecast – FAA Aerospace Forecasts, Fiscal Years 2017-2037 (the U.S. Federal Government fiscal year begins October 1). The national forecast serves as a major input to the development of the individual airport projections in the Terminal Area Forecasts ("TAF").

5.4.1 FAA U.S. Industry Projections[92]

Despite the moderate economic growth in fiscal year 2018, the U.S. aviation industry performed well, showing record profit and strong traffic growth. Overall passenger enplanements in the U.S. grew by 4.7 percent in 2018, the strongest growth compared to any of the years in the past decade. Domestic enplanements in 2018 grew 4.7 percent, while international enplanements grew by 5.0 percent. The growth in air traffic demand and moderate energy prices resulted in a profitable year yet again for the U.S. airline industry despite declining yields. The FAA's outlook for the future is optimistic, although long-term growth is not expected to be as strong as growth over the last year.

In the near term, world economic growth is forecast to accelerate from 2.4 percent in 2016 to 2.8 percent in 2017 and 3.1 percent in 2018. Real U.S. GDP growth is forecast to increase from 2.1 percent in FY 2017 to 2.6 percent in FY 2018, and remain nearly constant at 2.6 percent in FY 2019. From FY 2018 to FY 2022, real U.S. GDP growth is assumed to average 2.1 percent before falling to 2.0 percent for the remainder of the forecast period.

The FAA forecast assumes oil prices will decrease in FY 2019 by 4.3 percent, from approximately $51 per barrel in FY 2018 to $49 per barrel in FY 2019, but then begin rising again to $70 by FY 2022 at an average rate of 8.1 percent. It is assumed that oil prices will not return to FY 2014 levels (at $98 per barrel) until FY 2030 when prices will finally reach $99 per barrel, after which prices are projected to out grow the rate of inflation. Over the long-term forecast period (FY 2018 to FY 2038), the FAA assumes that oil prices increase at an average annual rate of 4.2 percent.

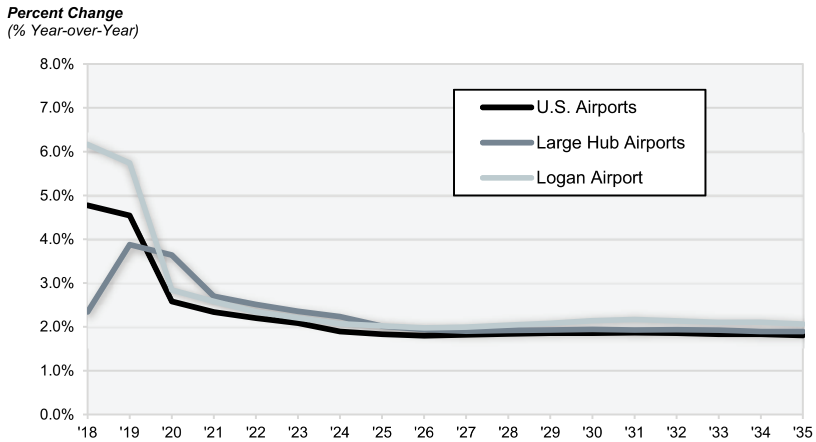
The FAA forecasts total passenger enplanements in the U.S. will grow by 3.3 percent in FY 2019. Domestic enplanements in FY 2019 are forecast to grow by 3.3 percent, while international enplanements are forecast to grow by 3.2 percent. Over the long-term forecast horizon (FY 2018-2038), total passenger enplanements are forecast to grow by an average annual rate of 1.9 percent. Domestic enplanements will grow by 1.7 percent, while international enplanements will grow by 3.3 percent through FY 2038. This compares to historic overall passenger growth of 2.4 percent per year between FY 2010 and FY 2017. Within the international market segment, the Latin America market is forecast to grow the fastest at 3.7 percent per year through FY 2038, followed by the Atlantic market at 2.6 percent per year and the Asia/Pacific market at 2.5 percent per year.

[92] FAA Aerospace Forecast includes U.S. Commercial Carriers projections only.

5.4.2 FAA Terminal Area Forecasts for Logan

After completing its industry level forecast, the FAA translates the national forecast into airport level forecasts. The FAA's most recent Terminal Area Forecast (TAF) for fiscal years 2018-2045 was released in February 2019. The TAF forecasts Logan's airline passenger traffic to increase at an average annual rate of 2.4 percent and grow to 58.6 million passengers in FY 2035. In the long term, as reflect in Exhibit 5-4, the TAF forecasts Logan Airport to grow at a similar rate to large hub airports and U.S. airports generally, with year-over-year growth ranging between 1.8 and 2.1 percent.

Exhibit 5-4: FAA TAF, Percentage Change (FY 2018 to FY 2035)



Note: FAA TAF forecast is for Federal fiscal years ended September 30; 2016 data is forecast by the FAA.
Source: FAA Terminal Area Forecast 2018-2045, February 2019.

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5.5 ICF Review of Massport Forecasts

Over the past several years, passenger traffic at Logan has experienced growth well above the national average. Airlines continue to be optimistic about the economic and demographic performance of the Boston market and are developing plans to add additional seat capacity at the Airport. Based on this, ICF believes that, in the short to medium term, passenger traffic growth at the Airport will continue to be robust, but will moderate over time. Over the long-term planning horizon, ICF believes that passenger volume at Logan will ultimately grow at a slower rate than the national average, reflecting Boston's maturing role as an air travel market.

Exhibit 5-5: Boston Logan Passengers Actual and Forecast (in thousands)

Calendar Year	Massport Financial	Annual Change	Massport Planning	Annual Change	FAA TAF \1	Annual Change
Actual	**FY**		**CY**		**FFY**	
2013	29,294		30,219		29,201	
2014	30,755	5.0%	31,634	4.7%	30,604	4.8%
2015	32,203	4.7%	33,450	5.7%	32,159	5.1%
2016	34,789	8.0%	36,288	8.5%	34,794	8.2%
2017	37,359	7.4%	38,412	5.9%	37,017	6.4%
2018	39,394	5.4%	40,942	6.6%	39,298	6.2%
Forecast						
2019	41,757	6.0%	42,800	4.5%	41,553	5.7%
2020	42,801	2.5%	44,700	4.4%	42,734	2.8%
2021	43,229	1.0%	45,600	2.0%	43,837	2.6%
2022	43,662	1.0%	46,500	2.0%	44,864	2.3%
2023	44,098	1.0%	47,100	1.3%	45,853	2.2%
Average Annual Growth						
2019-2023		1.4%		2.4%		2.5%

Notes: Massport's financial and planning forecasts are shown on a fiscal and calendar year basis, respectively; Massport's financial forecast exclude general aviation passengers; the planning forecast includes general aviation passengers.

\1 FAA TAF forecast is for Federal fiscal years ended September 30. TAF enplanement data is estimated for 2018.
Sources: Massport; FAA 2018 Terminal Area Forecasts (February 2019) for historic 2013-2017 and forecast 2018-2023.

ICF believes that the Massport financial forecast and the Massport planning forecast represent reasonable and conservative projections of future activity at the Airport, given the volatility facing the airline industry. The financial and planning forecasts assume a short-term average growth rate of 1.4 percent and 2.4 percent per year, respectively, through 2023.

The Boston air travel market is expected to remain a strong O&D market characterized by travel-intensive industries that generate business travel, as well as a strong market for LCC operations. However, because Boston is a relatively mature market, future passenger growth is expected to be similar to or slower than the national average (the FAA forecasts U.S. passenger enplanements to grow by 2.1 percent per year through 2038).[93]

In ICF's opinion, Massport's planning and financial forecasts represent reasonable projections of future passenger activity at Logan Airport, appropriate for facility and financial planning purposes.

[93] FAA Aerospace (FY 2018-2045).

5.5.1 Forecast Risks

Any forecast is subject to uncertainties. Inevitably, some assumptions will not be realized, and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material. While the Massport forecasts are based on historical data and future assumptions that ICF believes are reasonable, some of the underlying assumptions that are detailed explicitly or implicitly may not materialize due to unforeseen events or circumstances. The main uncertainties to the forecasts are:

- Future fuel prices;
- Terrorist acts that could disrupt air travel demand;
- Short-term service disruptions at the Airport due to further airline restructuring activities (liquidations or consolidation);
- The ability of airlines to operate profitably;
- Weak global economic growth;
- Environmental regulations that could increase airline costs or restrict activity;
- Long-term changes in air travel propensities;
- Congestion and delays in the national airspace system; and
- Changes in economic policies and infrastructure spending that may result from the current U.S. administration.

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APPENDIX D

REVIEW OF AIRPORT PROPERTIES NET REVENUES FORECAST

related to the proposed issuance of

MASSACHUSETTS PORT AUTHORITY

REVENUE BONDS, SERIES 2019-B (Non-AMT) and
REVENUE BONDS, SERIES 2019-C (AMT)

Prepared for

Massachusetts Port Authority
Boston, Massachusetts

Prepared by
LeighFisher
Burlingame, California

June 20, 2019

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CONTENTS

TABLES

EXHIBITS

LeighFisher

June 20, 2019

Mr. John P. Pranckevicius
Acting Chief Executive Officer and Executive Director
Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston, Massachusetts 02128

Re: **Review of Airport Properties Net Revenues Forecast**
Massachusetts Port Authority
Revenue Bonds, Series 2019-B (Non-AMT) and Series 2019-C (AMT)

Dear Mr. Pranckevicius:

LeighFisher is pleased to submit this review of the Airport Properties Net Revenues forecast in connection with the proposed issuance of Revenue Bonds, Series 2019-B (Non-AMT) (the 2019B Bonds) and Series 2019-C (AMT) (the 2019C Bonds, and collectively with the 2019B Bonds, the 2019 Bonds), by the Massachusetts Port Authority (the Authority). The 2019 Bonds are being issued pursuant to the Trust Agreement by and between the Authority and U.S. Bank National Association, as trustee, dated as of August 1, 1978, as amended and supplemented (the 1978 Trust Agreement). Capitalized terms not otherwise defined have the meanings given to such terms in the 1978 Trust Agreement.

The Authority is a multipurpose agency that owns and operates Boston-Logan International Airport (the Airport, or Logan Airport); Hanscom Field, a general aviation reliever airport; and Worcester Regional Airport (collectively, the Airport Properties); and certain Port Properties. As described in the Official Statement, to which this review is attached as an appendix, the 2019 Bonds are payable solely from Revenues of the Authority*, which include revenues from both the Airport Properties and the Port Properties. However, this review focuses solely on the Airport Properties, which in FY 2018** generated 83.9% of total Authority Revenues (i.e., references in this report to Airport Properties revenues pertain to 83.9% of total Authority Revenues as described in Appendix A to the Official Statement for the 2019 Bonds).

The Authority intends to issue the 2019 Bonds under the terms of its 1978 Trust Agreement to undertake certain capital improvement at Logan Airport and Conley Terminal, as follows:

- ***Terminal E Modernization – Phase 1 ($72.1 million of 2019 Bond proceeds):*** Upgrades to and expansion of Terminal E to create a unified passenger experience for users of the facility. Phase 1 of this project will include the construction of four new aircraft gates, a new security checkpoint, upgrades to Customs and Border Protection space, a ticketing hall, reconfiguration of the baggage claim hall and the addition of baggage carousels, and new concession areas,

*Additionally, the Authority expects to apply certain passenger facility charge revenues to the payment of debt service on a portion of the 2019 Bonds, as discussed later in this report.

**The Authority's Fiscal Year (FY) ends June 30.

among other improvements. (A second phase of this project, expected to be completed after FY 2023, would add an additional three gates.)

- ***Terminal B to C Roadway Improvements ($90.4 million of 2019 Bond proceeds):*** The replacement of sections of the departures level roadway between Terminal B and Terminal C originally built in the 1960s, including construction of a new departures level roadway viaduct, and a new arrivals level roadway surface.

- ***Terminal B Optimization ($42.0 million of 2019 Bond proceeds):*** Reconfiguration and consolidation of space previously occupied by American Airlines in both Pier A and Pier B of Terminal B into an area encompassing 18 contiguous gates for American Airlines in Pier B, and allowing for the relocation of Southwest Airlines from Terminal A to Terminal B.

- ***Terminal C Optimization and Terminal B to C Connector ($104.7 million of 2019 Bond proceeds):*** Construction of a post-security connector from Terminal C, Pier C (near Gate C25) to Terminal B, Pier A (near Gate B38), including renovations to the existing facilities adjacent to these gates (including modifications to existing passenger holdrooms and gates, the elimination of an existing security checkpoint, and the reconfiguration of the current main security checkpoint in Terminal C).

- ***Terminal C Canopy and Upper Deck ($64.8 million of 2019 Bond proceeds):*** Expansion of the departures level plaza and the arrivals level curbside area for Terminal C to provide additional curb length and travel lanes on both levels, and replacement of the canopy on the departures level.

- ***New Berth 10 and Cranes at Conley Terminal ($93.3 million of 2019 Bond proceeds):*** Construction of a new Berth 10 at Conley Terminal and the acquisition of three ship-to-shore cranes capable of accommodating new larger vessels.

The Authority is currently undertaking a $4.4 billion capital program for the period FY 2019 to FY 2023 (the FY 2019-FY 2023 Capital Program) encompassing $2.6 billion of Authority funded projects and $1.8 billion of third-party funded projects, of which:

- ***Airport Properties*** total $2.2 billion in capital improvements ($2.1 billion for Logan Airport and a combined $125 million for Hanscom and Worcester, including $150 million in third-party funded improvements across all three airports);

- ***Port Properties*** total $2.1 billion in capital improvements ($433 million in Authority-funded capital improvements and an additional $1.7 billion in public or private, third-party investment); and

- ***Agency-wide*** improvements (which encompass assets that benefit the entire Authority, such as Authority-wide technology systems) total $112 million.

The Authority has prepared certain financial forecasts in connection with the issuance of the 2019 Bonds, which are included in Appendix A to the Official Statement for the 2019 Bonds, to which this review is attached as Appendix D.

SCOPE OF STUDY

In conducting our study, we reviewed:

- The estimated costs and funding sources for Airport Properties capital improvements included in the FY 2019-FY 2023 Capital Program, as prepared by the Authority.

- The forecast sources and uses of funds for the 2019 Bonds, and associated forecast annual debt service requirements for the 2019 Bonds, as prepared by the Authority and its financial advisor, PFM Financial Advisors LLC, as well as the Authority's preliminary plans for future bond issues during the period FY 2020 through FY 2023. (As part of separate services provided to the Authority under LeighFisher's contract with the Authority, we assisted the Authority and its financial advisor in formulating a plan of finance for implementing the FY 2019-FY 2023 Capital Program).

- The Authority's approved passenger facility charge (PFC) program. We also reviewed the Authority's preliminary plans for future PFC applications during the period FY 2019 through FY 2023. PFC revenues of the Authority are not pledged to the payment of debt service on the 2019 Bonds. However, the Authority anticipates, and this forecast assumes, that the Authority will apply PFCs to pay a portion of the debt service on the recently issued Series 2019A Bonds in the amount of approximately $8.8 million per year, as well as to pay a portion of the debt service on the 2019C Bonds and certain future Bonds of the Authority.

- The Authority's Strategic Plan reflecting the Authority's current intentions regarding the long-term development of its Airport Properties as well as the Authority's non-aviation properties.

- The Authority's rental car customer facility charge (CFC) program, including its history of CFC collections since inception of the program in 2008. CFC revenues of the Authority are not pledged to the payment of debt service on the 2019 Bonds.

- The Authority's business arrangements related to the development and operation of the Rental Car Center that opened for service in 2013, as well as the concession agreements between the Authority and the rental car companies related to rental car operations at the Airport.

- The Authority's forecast of deposits to the Payment in Lieu of Taxes (PILOT), Self-Insurance, Maintenance Reserve, Capital Budget, and Improvement and Extension funds or accounts.

- The Authority's policies and rate-making procedures relating to the calculation of airline terminal rents and landing fees, as documented in the Authority's financial model for calculating annual airline rates and charges, the Authority's document titled "Preliminary

FY19 Commercial Aviation Rates," which was adopted as the rate schedule in effect for FY 2019, and documentation of Authority Board votes related to airline rates and charges.

- Contractual agreements relating to the use and occupancy of Airport Properties, focusing on those that materially contribute to Airport Properties revenue totals, including the Delta Air Lines and Southwest Airlines leases for portions of Terminal A; the American Airlines, United Airlines, and Spirit Airlines leases for portions of Terminal B; the JetBlue Airways lease for portions of Terminal C; as well as agreements governing the operation of concession privileges in the terminal area, agreements related to the operation of rental car activities at the Airport, and agreements with transportation network companies (TNCs) operating at the Airport.

- The Authority's procedure for allocating general and administrative expenses and PILOT costs as documented in the Authority's financial model for calculating annual airlines rates and charges.

- Historical correlations between and among Airport Properties revenues, Airport Properties operating expenses, and passenger enplanements at the Airport.

- The Authority's actual Airport Properties operating expenditures for FY 2018, the Authority's estimated operating expenditures for FY 2019 based on trends in actual data for the first nine months of FY 2019 and budgeted amounts for the remaining three months of FY 2019, the Authority's preliminary budget for operating expenses for FY 2020, and the Authority's forecast of operating expenses for FY 2021 through FY 2023.

- The Authority's actual Airport Properties operating revenues for FY 2018, the Authority's estimated revenues for FY 2019 based on trends in actual data for the first nine months of FY 2019 and budgeted amounts for the remaining three months of FY 2019, and the Authority's forecast revenues for FY 2020 through FY 2023.

- The Authority's Comprehensive Annual Financial Report (CAFR) for FY 2017 and FY 2018.

We have relied upon the information listed above and other information provided to us without validating the accuracy, completeness, or reliability of such information. While we have no reason to believe that the information does not provide a reasonable basis for the financial forecasts set forth in this review, we offer no assurances as to the accuracy or reliability of such information.

We have relied upon the estimates of project costs and construction schedules for projects included in the FY 2019-FY 2023 Capital Program as prepared by the Authority. We did not conduct an independent review of the cost estimates or the construction schedules, and offer no opinion on the reasonableness of such costs or the achievability of such schedules.

We reviewed the key factors upon which the Airport Properties Net Revenues may depend, and assisted the Authority in formulating certain assumptions about those factors. Specifically, we assisted the Authority in formulating assumptions regarding passenger enplanements, airline revenues, and operating expenses including incremental operating expenses for new Airport facilities;

and we reviewed the Authority's forecasts of parking, rental car, TNC, and terminal concession revenues.

KEY FACTORS AFFECTING THE NET REVENUES FORECAST

The forecast of Airport Properties Net Revenues is set forth in the accompanying Exhibit A. Achievement of the financial forecast will depend particularly on achievement of the assumptions regarding the key factors described below.

Aviation Activity Forecast

As shown in Table 1, the Authority's financial forecast is based on the assumption that total passengers at the Airport will increase by 6.0% in FY 2019 compared to FY 2018 (based on nine months of actual data for FY 2019, during which period total passengers increased by 6.8%), and reach 41.8 million passengers for the full FY 2019. Further, the Authority's forecast reflects a 2.5% annual increase in FY 2020, followed by 1.0% annual increases in each of FY 2021, FY 2022, and FY 2023 (the final year of the forecast period), reaching 44.1 million passengers in FY 2023. The Authority's assumptions for forecast passenger growth were developed in coordination with LeighFisher and were based upon partial year actual results, advance airline schedules, and assumptions regarding future air travel demand. The Authority and LeighFisher believe the passenger forecast provides a reasonable basis for financial planning; however, any forecast is subject to risk, volatility, and uncertainty, such as that described in more detail within this section of the report.

Table 1
ACTUAL AND FORECAST PASSENGERS
Boston-Logan International Airport
(For the 12 months ending June 30, in thousands)

	Actual	Forecast				
	FY 2018	**FY 2019 (b)**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**
Total Passengers (a)	39,394	41,757	42,801	43,229	43,662	44,098
Percentage change		*6.0%*	*2.5%*	*1.0%*	*1.0%*	*1.0%*

(a) Excludes general aviation passengers.
(b) Reflects actual data for the nine months ended March 31, 2019, and budgeted data for the remaining three months of FY 2019.

Source: Massachusetts Port Authority.

Aviation Activity Forecast Risk Factors

As the Airport predominantly serves origin and destination activity (and has limited connecting passenger activity), future growth in aviation activity at the Airport will occur largely as a function of the growth in the population and economy of the Boston area, as well as regional, national, and international economic performance.

Several factors will play a role in the growth in aviation activity at the Airport, including:

- Local demographic and economic conditions
- Structural changes in the travel market
- Airline service at the Airport and other regional airports, particularly Manchester Boston Regional Airport in Manchester, New Hampshire (Manchester) and T.F. Green Airport in Warwick, Rhode Island (T.F. Green)
- Aviation safety and security concerns
- The financial health of the airline industry
- Airline service, competition, routes, and fares
- Demand for air cargo
- Availability and price of aviation fuel
- Capacity of the national air traffic control system, and
- Capacity of Boston-Logan International Airport

Local demographic and national economic conditions. Both the demographics of the region in which the Airport operates as well as national economic conditions generally impact the level of passenger traffic at the Airport. The national economic recession experienced in 2008 and 2009 had a negative effect on passenger traffic at the Airport. Passenger numbers (enplaned plus deplaned passengers) for FY 2009 totaled 25.0 million, representing a 10.3% decline from the 27.9 million passengers that traveled through the Airport in FY 2007 (which at that time was a record number).

Starting in late 2009, traffic levels at the Airport began to recover. In FY 2018, passenger numbers reached 39.4 million (excluding general aviation passengers), a new high.

The Boston metropolitan area* was the 10th largest metropolitan area in the United States in terms of population as of July 2018** (the most recent data available), and it ranked 9th in the nation with 2.7

*The Boston metropolitan area, as defined here, includes the counties of Essex, Middlesex, Norfolk, Plymouth, and Suffolk counties in Massachusetts and Rockingham and Strafford counties in New Hampshire. The Airport market analysis attached as Appendix C to the Official Statement uses a slightly different geographic definition of the Logan Airport service area and, accordingly, the economic data presented therein may be different from the data reflected in this report.

**Source: census.gov, accessed April 19, 2019.

million employees as of March 2019. It had an unemployment rate of 2.7% in March 2019, below the national average of 3.8%, and 7.1 percentage points lower than the peak of 9.8% in January 2010.

The unemployment rate in the Boston metropolitan area was the second lowest rate among the nation's 51 largest metropolitan areas (i.e., those with a 2010 Census population of one million or more) as of March 2019*, according to information from the U.S. Census website and the Bureau of Labor Statistics. In the greater Boston area, the following six major sectors have contributed to the Boston region's economic growth since the early 1990s and currently account for approximately one half of the Boston area employment base: high technology, biotechnology, health care, financial services, higher education and tourism**.

As described in more detail in Appendix C to the Official Statement, the Boston metropolitan area's average per capita personal income in calendar year 2017 was 35.3% above the national average and 8.7% above the New England average. During the period 2002 to 2017, Massachusetts per capita income grew slightly faster than the national average. It is projected to grow at a rate of 1.2% annually from 2017 to 2032, which is just above the projected nationwide growth rate of 1.1%.

As the nation's 10th largest metropolitan area, the Boston metropolitan area provides a large pool of potential travelers using the Airport. Moreover, increases in employment and per capita income translate into an increased likelihood of that population's propensity to travel by air. In addition, the Boston metropolitan area's status as a major business, tourism, and education destination serves as a draw for visitors, many of whom arrive by air.

Structural changes in the travel market. With the globalization of business and the increased importance of international trade and tourism, international economics, trade balances, currency exchange rates, government policies, and political relationships all influence passenger traffic at major U.S. airports. Concerns about hostilities and other perceived security and public health risks and associated travel restrictions also affect travel demand to and from particular international destinations. Sustained future increases in passenger traffic at the Airport will depend on global economic growth, stable and secure international conditions, and government policies that do not materially restrict international travel.

Airline service at the Airport and other regional airports. The Airport is scheduled to have an average of 494 scheduled daily nonstop departures to destinations throughout the United States during June 2019. Additionally, there are approximately 80 average daily international departures, primarily to Canadian and European destinations, but also including destinations in Central America, the Caribbean, Asia, the Middle East, South America, and Africa. Several foreign flag carriers have commenced service at the Airport since 2015 and continue to serve the Airport currently, including Alitalia, Cathay Pacific, Cabo Verde, El Al, KLM, Korean Air, LATAM Airlines Brasil, Norwegian Air Shuttle, Qatar, Royal Air Maroc, SAS, SATA, TAP Portugal and WestJet.

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*Source: bls.gov, accessed May 14, 2019. Data for March 2019 is preliminary.

**Source: bea.gov, accessed May 14, 2019.

There is no significant market share concentration among either domestic or foreign flag carriers at the Airport. JetBlue had the largest share of total Airport passengers with approximately 28% in FY 2018, but four different airlines have more than a 7% share of the international market at the Airport (Air Canada, British Airways, Delta, and JetBlue). The Airport is primarily an origin-destination airport, with approximately 94% of passengers beginning or ending their travel at the Airport.

JetBlue places emphasis on routing international connecting traffic through its major East Coast airports (New York-Kennedy, Fort Lauderdale, and Logan Airport). JetBlue's strategy is to enter into alliances and agreements with foreign flag carriers to feed its domestic route network with international passengers. JetBlue has such agreements with Aer Lingus, Emirates Airlines, and TAP Portugal, among other airlines. While to date there has been no discernable impact on connecting passenger activity levels at Logan Airport resulting from these arrangements, there may be a resulting increase in connecting passenger activity at Logan Airport in the future. The Authority's passenger traffic forecasts described in this report do not incorporate increases in passenger hubbing activity that could potentially occur in the future, which would likely be accretive to the forecast passenger numbers.

Of the three major airports serving the Boston area (which include T.F. Green and Manchester, in addition to Logan Airport), the Airport has always had by far the largest passenger market share in the region. However, during the period from approximately 1995 to 2005, the Airport's regional market share declined from 89% to 73% as low cost carriers (LCCs) aggressively built up their operations at Manchester and T.F. Green. The shift in service at that time was partly attributable to construction of the underground Central Artery and Third Harbor Tunnel roadway project, which inhibited Airport access. Since 2005, however, the trend has reversed. A strong buildup of LCC activity at the Airport, combined with retrenchment at Manchester and modest growth at T.F. Green, has driven the Airport's regional market share back up to 87% in calendar year 2018.

Aviation safety and security concerns. Concerns about the safety of airline travel and the effectiveness of security precautions influence passenger travel behavior and airline travel demand. Anxieties about the safety of flying and the inconveniences and delays associated with security screening procedures lead to both the avoidance of travel and the switching from air to surface modes of transportation for short trips. Public health and safety concerns have also affected airline travel demand from time to time.

Safety concerns in the aftermath of the September 2001 terrorist attacks were largely responsible for the steep decline in airline travel nationwide in 2002. Since 2001, government agencies, airlines, and airport operators worldwide have upgraded security measures to guard against changing threats and maintain confidence in the safety of airline travel. These measures include strengthened aircraft cockpit doors, changed flight crew procedures, increased presence of armed sky marshals, federalization of airport security functions under the Transportation Security Administration (TSA), more effective dissemination of information about threats, more intensive screening of passengers and baggage, and deployment of new screening technologies. The TSA has introduced "pre-check" service to expedite the screening of passengers who have submitted to background checks.

Following the fatal crashes of Boeing 737 MAX aircraft that are suspected to have been caused by the malfunction of the aircraft's automated flight control system, all Boeing 737 MAX aircraft were grounded in March 2019. Among North American airlines, Air Canada, American, Southwest, and United are being affected. At the time of the grounding, Boeing 737 MAX aircraft accounted for approximately 1.5% of U.S. airline seat capacity. While it is expected that the grounding will last several months while the flight control system software is updated and approved by the FAA, and pilot training is completed, the grounding of this aircraft is not expected to have a significant impact on operations at Logan Airport.

Historically, airline travel demand has recovered after temporary decreases stemming from terrorist attacks or threats, hijackings, aircraft crashes, and other aviation safety concerns. Provided there are no major events and precautions by government agencies, airlines and airport operators that serve to reduce confidence in the safety of commercial aviation, or impose unacceptable inconveniences for airline travelers, future demand for airline travel will depend primarily on economic, not safety or security, factors.

***The financial health of the airline industry*.** The number of passengers using the Airport will depend partly on the profitability of the U.S. airline industry and the associated ability of the industry and individual airlines to make the necessary investments to provide and expand service. From 2010 through 2013, the U.S. passenger airline industry as a whole recorded net income of approximately $18 billion, notwithstanding sustained high fuel prices, by controlling capacity and nonfuel expenses, increasing airfares, recording high load factors, and increasing ancillary revenues. Between 2010 and 2013, the airlines collectively increased domestic seat-mile capacity by an average of 1.0% per year. In 2014, the U.S. passenger airline industry reported net income of $9 billion, assisted by reduced fuel prices in the second half of the year (as discussed in the later heading, "Availability and price of aviation fuel"). In 2015, the industry then achieved record net income of $26 billion, as fuel prices decreased further, demand remained strong, and capacity control allowed average fares and ancillary charges to remain high. Strong industry profitability continued in 2016 through 2018, despite gradually increasing costs, in part due to a shortage of qualified pilots resulting from retirements and changed FAA qualification standards and duty and rest rules, which have required the airlines to increase salaries and improve benefits to attract and retain pilots. Sustained industry profitability will depend on, among other factors, economic growth to support travel demand, continued capacity control to enable increased airfares, and stable fuel prices and labor costs.

Consolidation of the U.S. airline industry has resulted from the merger of Delta and Northwest (2009), the merger of United and Continental (2010), the acquisition of AirTran by Southwest (2011), the merger of American and US Airways (2013), and the acquisition of Virgin America by Alaska (2016, which became effective in 2018).

Such consolidation has resulted in four airlines (American, Delta, Southwest, and United) and their regional affiliates now accounting for approximately 80% of domestic seat-mile capacity. The consolidation has contributed to industry profitability. However, any resumption of financial losses could cause U.S. airlines to seek bankruptcy protection or liquidate. The liquidation of any of the large network airlines could significantly affect airline service at certain connecting hub airports and change airline travel patterns nationwide.

Because Logan Airport is predominantly an origin and destination airport, with limited connecting passenger activity, it is expected that if JetBlue or another carrier serving the Airport were to liquidate or were to significantly reduce service at the Airport as a result of a merger with another airline, there would be no material long-term reduction in the number of passengers using the Airport, because other airlines would be expected to increase service to accommodate passengers who would otherwise have traveled on the liquidated carrier. In the event of such an occurrence, however, there could be a material reduction in passenger numbers at the Airport in the short term, because the other airlines serving the Airport would require lead time to adjust their local operations and flight schedules.

Airline service, competition, routes, and fares. The number of origin and destination passengers traveling through the Airport depends on the propensity of Boston region residents to travel by air and the intrinsic attractiveness of the region as a business and leisure destination. Although passenger demand at an airport depends primarily on the population and economy of the region served, airline service and the number of passengers enplaned also depend on the route networks of the airlines serving that airport. Major network airlines have emphasized the development of hub-and-spoke route networks as a means of increasing their service frequencies, passenger numbers, and profitability. Logan Airport almost exclusively serves origin-destination passengers. It does not serve as a hub for any airline and, consequently, is not dependent on connecting passengers.

Airline fares have an important effect on passenger demand, particularly for relatively short trips for which the automobile and other travel modes are potential alternatives, and for price-sensitive "discretionary" travel. The price elasticity of demand for airline travel increases in weak economic conditions when the disposable income of potential airline travelers is reduced. Airfares are influenced by airline capacity and yield management; passenger demand; airline market presence; labor, fuel, and other airline operating costs; taxes, fees, and other charges assessed by the airlines themselves as well as governmental and airport agencies; and competitive factors. Future passenger growth – globally, nationwide, and at the Airport – will depend partly on the level of airfares.

Overcapacity in the industry, the ability of consumers to compare airfares and book flights easily via the Internet, and other competitive factors combined to reduce airfares between 2000 and 2005. From 2006 through 2008, as airlines reduced capacity and were able to sustain fare increases, the average domestic yield increased. In 2009, yields again decreased, but, beginning in 2010, as airline travel demand increased and seat capacity was restricted, yields increased through 2014. Between 2015 and 2016, domestic yields decreased again, reflecting lower aviation fuel prices and increased airline competition, and yields have been fairly stable since.

Beginning in 2006, charges were introduced by most airlines for optional services such as checked baggage, preferred seating, in-flight meals, and entertainment, thereby increasing the effective price of airline travel.

LCC carriers, including ultra-low cost carriers (ULCCs), have aggressively expanded their operations throughout the nation. LCCs are carriers that take advantage of an operating cost structure that is significantly lower than the cost structure of the legacy carriers. These advantages can include lower labor costs, greater labor flexibility, a streamlined aircraft fleet (i.e., fewer different types of aircraft in a given airline's fleet), and a generally more efficient operation. ULCCs are carriers that disaggregate the various services and amenities involved in an air trip and charge passengers for them separately on an a la carte basis. The price of a ticket quoted by a ULCC carrier is typically just for the seat on the aircraft. These low costs suggest that the LCCs and ULCCs can offer a low fare structure to the traveling public while still maintaining profitability. In calendar year 2018, LCCs (including ULCCs) provided approximately 30% of the airline seat capacity in the U.S. market.

LCCs have significantly increased their service at the Airport, in common with many large hub airports* nationwide. Five domestic LCCs currently operate at the Airport—Frontier, JetBlue, Southwest, Spirit, and Sun Country (of those, Frontier, Spirit, and Sun Country are considered ULCCs). These airlines collectively lease 31 of the 97 contact gates at the Airport.

In addition, four foreign flag LCCs—Level, Norwegian (including Air Shuttle and UK), Porter, and WestJet, provide international service to eight destinations. The foreign flag LCCs use the common use gates in Terminal E, with the exception of WestJet, which subleases a gate in Terminal A from Delta. Collectively, the nine LCCs provide 217 daily departures as of June 2019 (according to published schedules) and account for 41.5% of Airport-wide scheduled departing seats in FY 2019, significantly higher than the national average, and up from 27% in FY 2010.

Notwithstanding these trends, to some extent, there is now a blurring of the distinction between the major network airlines and the traditional LCCs. As the LCCs have started to serve airports in major metropolitan areas (such as JetBlue at Logan Airport and New York-Kennedy; Southwest at Logan Airport and New York-LaGuardia, etc.), and some LCCs have faced increases in labor costs (e.g., unionized labor and maturing crews with increased pay), the cost base of the traditional LCC has trended upwards. At the same time, the network carriers have been striving to adopt some of the practices and operational norms of the LCCs, resulting in a general downward trend for major network airline costs.

Demand for air cargo. Although economic activity is the primary factor affecting world air cargo demand, there are other important factors, some of which are influenced by airline actions. Air cargo development is influenced by such airline actions as the acquisition of new aircraft, increased capacity in certain regions or on specific routes, and expansion of air cargo provider products and services. Factors beyond the control of airlines and the cargo industry as a whole (freight forwarders, warehouse operators, local trucking companies) include changing inventory management techniques, globalization of trade, market liberalization, electronic delivery of documents, increased security screening requirements, continuing introduction of new products that are conducive to shipment by air (e.g., lightweight but high-value electronics, computer equipment, pharmaceuticals), evolving modes of product delivery and advanced techniques of product manufacturing (e.g., 3D printing).

For the 12 months ending September 30, 2018, 373,554 tons of cargo and mail were shipped through Logan Airport. Logan Airport was the 21st busiest cargo airport in the U.S. during that period, according to the U.S. DOT. As such, cargo is considered a significant contributor to operations at the Airport.

*Large hub airports are defined by the FAA as those that represent at least 1% of total enplanements nationwide.

Historically, the financial performance of the air cargo and cargo transportation industry has experienced periods of growth and decline, but generally speaking, the financial health and performance has been more stable and consistent than that of the U.S. passenger airline industry. Sustained profitability will depend on, among other factors, economic growth to support air cargo demand, continued growth in online retail sales, continued control over air package pricing, and stable fuel prices. Boeing and Airbus forecast worldwide growth in air cargo tonnage of approximately 4% per year over the next 20 years, driven primarily by growth in emerging markets.

Availability and price of aviation fuel. The price of aviation fuel is a critical and uncertain factor affecting airline operating economics. Fuel prices are particularly sensitive to worldwide political instability and economic uncertainty.

Between 2011 and 2014, aviation fuel prices were relatively stable, partly because of increased oil supply from U.S. domestic production, made possible by the hydraulic fracturing of oil-bearing shale deposits and other advances in extraction technology. As of mid-2014, average fuel prices were approximately three times those prevailing at the end of 2003, and accounted for between 30% and 40% of expenses for most airlines.

Beginning in mid-2014, an imbalance between worldwide supply and demand resulted in a precipitous decline in the price of oil and aviation fuel through the end of 2015. Fuel prices have since increased, but the average price of aviation fuel at the end of 2018 was still approximately 30% below the price at mid-2014. Lower fuel prices have a positive effect on airline profitability as well as far-reaching implications for the global economy.

Airline industry analysts hold differing views on how oil and aviation fuel prices may change in the near term, although, absent unforeseen disruptions, prices are expected to remain stable. There is widespread agreement that fuel prices are likely to increase over the long term as global energy demand increases in the face of finite oil supplies that are becoming more expensive to extract. Some economists predict that the development of renewable sources of energy, pressures to combat global climate change, the widespread use of electric cars, and other trends will eventually result in a decline in the demand for oil and resulting downward pressure on fuel prices. Aviation fuel prices will continue to affect airfares, passenger numbers, airline profitability, and the ability of airlines to provide service. Airline operating economics will also be affected as regulatory costs are imposed on the airline industry as part of efforts to reduce aircraft emissions contributing to global climate change.

Capacity of the national air traffic control system. Demands on the national air traffic control system have, in the past, caused delays and operational restrictions affecting airline schedules and passenger traffic. The FAA is gradually implementing its Next Generation Air Transportation System (NextGen) air traffic management programs to modernize and automate the guidance and communications equipment of the air traffic control system and enhance the use of airspace and runways through improved air navigation aids and procedures. Since 2007, airline traffic delays nationwide have decreased as a result of reduced numbers of aircraft operations (down approximately 15% between 2007 and 2018), but, as airline travel increases in the future, flight delays and restrictions can be expected.

Capacity of Boston-Logan International Airport. In addition to any future constraints that may be imposed by the national air traffic control and national airport systems, future growth in airline traffic at the Airport will depend in part on the capacity of the Airport itself. Authority management believes that current facilities at the Airport (i.e., airfield, terminal, landside, and Airport access facilities), in conjunction with the projects to be undertaken as part of the FY 2019-FY 2023 Capital Program, will provide sufficient airside, terminal, and landside capacity to accommodate the assumed level of passenger traffic that underlies the financial forecasts through FY 2023 (the final year of the forecast period).

Airport Properties Revenues

As shown in Table 2, the Authority's Airport Properties Revenues are forecast to increase from $711.0 million in FY 2018 to $741.5 million in FY 2019, an overall increase of 4.3%, based on actual figures for the first nine months of FY 2019, and budgeted Revenues for the remainder of the year. Airport Properties Revenues are forecast to increase at a compound annual growth rate (CAGR) of 5.1% from FY 2018 to FY 2023, reaching $912.2 million in FY 2023.

Logan airline revenues. The Authority expects to continue to calculate airline rents and fees generally on the basis of existing rate-making procedures, as documented in the Authority's financial model for calculating annual airlines rates and charges, and the Authority's document titled "Preliminary FY19 Commercial Aviation Rates." Terminal rentals are calculated using a "commercial compensatory" methodology, with the Authority recovering a portion of the allocated operating expenses and capital costs for each terminal through terminal rental revenues. Where applicable, the Authority's lease agreements with air carriers for terminal space at the Airport state that the Authority may revise rental rates periodically, at the Authority's discretion, to recover the actual direct and indirect capital and operating costs for such leased space. The landing fee rate is calculated on a "cost center residual" basis, with the allocated operating and capital costs for the airfield area, net of certain revenues generated from miscellaneous activities on the airfield, divided by the scheduled airlines' landed weights.

Logan airline revenues, including landing fees, terminal rentals, and tenant aircraft parking, accounted for 42.5% of Airport Properties revenues in FY 2018, or $302.4 million, and are forecast to increase to $325.0 million in FY 2019. This category is forecast to increase at a CAGR of 8.8% from FY 2018 to FY 2023, reaching $461.7 million in FY 2023.

The forecast increase is primarily driven by: (1) increases to the airline cost base associated with projects in the FY 2019-FY 2023 Capital Program, and (2) the inclusion of all airline rental payments to the Authority for the occupancy of Terminal A, reflecting the impact of the Authority's recent Series 2019A Bond issuance (the 2019A Bonds), the proceeds of which were used to refund and retire all of the outstanding Terminal A special facility bonds. Previously, a portion of the airline Terminal A rental revenues were applied to debt service payments on the Terminal A special facility bonds and therefore were not Revenues of the Authority under the 1978 Trust Agreement.

Table 2

ACTUAL AND FORECAST AIRPORT PROPERTIES REVENUES

Massachusetts Port Authority

(For the 12 months ending June 30, $ in thousands)

	Actual FY 2018 (a)	Forecast FY 2019 (b)	FY 2020	FY 2021	FY 2022	FY 2023
Logan Revenues						
Landing Fees (c)	$ 119,190	$ 121,844	$ 126,656	$ 131,590	$ 142,860	$ 155,303
Automobile Parking Fees	180,349	179,281	182,938	186,841	189,711	190,283
Utility Fees	15,348	13,444	10,785	11,506	13,733	15,156
Terminal Rentals (c)	180,387	200,376	227,727	238,707	295,380	303,604
Non-Terminal Building & Ground Rents						
Hangar/Cargo Rentals	$ 20,987	$ 21,509	$ 21,798	$ 22,094	$ 22,397	$ 22,704
Other Building Rentals	7,238	8,209	8,385	8,566	8,752	8,942
Ground Rent	19,055	18,593	18,867	19,146	19,431	19,720
Fuel Farm	1,619	1,634	1,651	1,668	1,684	1,701
Ramp & Apron	3,957	4,197	4,263	4,330	4,399	4,469
Subtotal: Non-Terminal Building & Ground Rents	$ 52,856	$ 54,142	$ 54,964	$ 55,804	$ 56,663	$ 57,535
Concessions						
Terminal Concessions	$ 54,948	$ 61,201	$ 54,057	$ 58,617	$ 63,137	$ 65,037
Rental Car	33,968	35,300	31,900	32,219	32,541	32,867
Taxi	4,049	3,724	3,720	3,500	3,200	2,800
Transportation Network Companies	8,210	9,895	16,452	20,232	21,342	22,367
Other Landside Concessions (d)	12,620	12,173	11,923	11,949	11,975	12,002
Subtotal: Concessions	$ 113,796	$ 122,294	$ 118,052	$ 126,518	$ 132,196	$ 135,073
Other						
Shuttle Bus	$ 20,303	$ 20,771	$ 21,969	$ 22,952	$ 23,686	$ 24,145
Tenant Aircraft Parking (c)	2,828	2,756	2,756	2,756	2,756	2,756
Security Checkpoint Reimbursement	1,856	1,380	1,167	1,167	1,167	1,167
Miscellaneous Revenues	8,071	8,001	8,436	8,562	8,712	8,864
Subtotal: Other	$ 33,057	$ 32,908	$ 34,328	$ 35,437	$ 36,321	$ 36,932
Subtotal: Logan Revenues	$ 694,983	$ 724,288	$ 755,450	$ 786,402	$ 866,864	$ 893,887
Hanscom and Worcester Revenues	16,062	17,253	16,802	17,284	17,803	18,315
Airport Properties Revenues	$ 711,046	$ 741,541	$ 772,252	$ 803,686	$ 884,666	$ 912,202
Percentage change		*4.3%*	*4.1%*	*4.1%*	*10.1%*	*3.1%*
Logan Airline Revenues (c)	$ 302,404	$ 324,976	$ 357,139	$ 373,053	$ 440,996	$ 461,663
Percentage change		*7.5%*	*9.9%*	*4.5%*	*18.2%*	*4.7%*

(a) Revenue subtotals may differ from the Appendix A Information Statement of the Authority due to alternate groupings of terminal rentals, other, and concessions subtotals.

(b) Reflects actual data for nine months ended March 31, 2019, and budgeted data for the remaining three months of FY 2019.

(c) Logan Airline Revenues include Landing Fees, Terminal Rentals, and Tenant Aircraft Parking. The airline rental revenues for Terminal A included in the terminal rental totals shown in this table reflect the portion of Terminal A airline rentals that are revenues of the Authority under the 1978 Trust Agreement. For FY 2018 and part of FY 2019, a portion of the rental revenues generated from Terminal A are excluded from this line item, as such portion was directed to Terminal A special facility bond debt service and was not part of revenues under the 1978 Trust Agreement. Subsequent to February 13, 2019, all Terminal A rental revenues are included in this line item, reflecting the issuance of the 2019A Bonds.

(d) Other landside concessions include bus and limousine, ground service, and customer amenity services.

Source: Massachusetts Port Authority.

Automobile parking fees. Automobile parking fees accounted for 25.4% of Airport Properties Revenues in FY 2018, or $180.3 million, and are forecast to decline to $179.3 million in FY 2019, primarily reflecting a reduction in the number of parking exits. Automobile parking fees are forecast to increase at a CAGR of 1.1% from FY 2018 to FY 2023, reaching $190.3 million in FY 2023, primarily driven by increased parking rates offset by a decrease in total parking exits due to higher parking rates and the continued increase in the use of TNCs to and from the Airport. TNCs were originally approved to operate at the Airport in February 2017.

The Authority's Board has approved an increase of $3 in the daily parking rates for all of Logan Airport's parking facilities to go into effect on July 1, 2019. There is expected to be a further increase of $3 on July 1, 2021, which has also been approved by the Authority's Board. The daily parking rate in the central parking facility is scheduled to increase from $35 in FY 2019 to $38 in FY 2020, and to $41 in FY 2022. Parking rates are not expected to be adjusted at the Authority's off-Airport Logan Express lots during the forecast period.

Concessions. Concessions accounted for 16.0% of Airport Properties revenues in FY 2018, or $113.8 million, and are forecast to increase to $122.3 million in FY 2019. Concessions include retail, duty free and food and beverage concessions in the terminals, rental car privilege fees and certain ground transportation fees and charges (including TNC revenues). This revenue category is forecast to increase at a CAGR of 3.5% between FY 2018 and FY 2023, reaching $135.1 million in FY 2023.

Terminal concession revenues totaled $54.9 million in FY 2018 and are forecast to increase to $61.2 million in FY 2019, and to $65.0 million in FY 2023 (a CAGR of 3.4% between FY 2018 and FY 2023). The Authority recently entered into a new 10-year contract with MarketPlace Logan LLC for the management of the majority of terminal concession operations at the Airport. (Previously, the four terminals at the Airport were managed under multiple concessions contracts.) The development of enhanced concession facilities under the new contract began in FY 2019 and includes a new and higher minimum annual guarantee (MAG) structure. Authority management expects that consolidating concessions management under a single contract with an industry leader will ensure consistency, continuity, and choice for the passengers traveling through the Airport. Enhancements to per passenger spending rates on terminal concessions resulting from the new MarketPlace contract have been assumed for purposes of this forecast.

The Authority's Board recently voted to amend the fee structure for TNCs operating at the Airport. Effective October 1, 2019, a fee of $3.25 per passenger pick-up and $3.25 per drop-off will be charged (compared to a fee of $3.25 per pick-up currently, with no drop-off charge). TNC revenues totaled $8.2 million in FY 2018 and are forecast to increase to $9.9 million in FY 2019. TNC revenues are forecast to increase to $22.4 million in FY 2023, a CAGR of 22.2% between FY 2018 and FY 2023, primarily reflecting the amended fee structure scheduled to go into effect during FY 2020.

The Authority has reflected relatively flat revenue trends from rental car and other ground transportation activities (as well as parking, as described above) in FY 2019 and beyond compared to prior years to take account of the continued increase in the use of TNC services to and from the Airport.

Non-terminal building and ground rents. Non-terminal building and ground rents accounted for 7.4% of Airport Properties Revenues in FY 2018, or $52.9 million, and are forecast to increase to $54.1 million in FY 2019. Non-terminal building and ground rents are comprised of hangar/cargo rentals, other building rentals, ground rent, fuel farm, and ramp and apron revenues. Overall, non-terminal building and ground rent revenue is forecast to increase at a CAGR of 1.7% from FY 2018 and FY 2023, reaching $57.5 million in FY 2023.

Utility fees. Utility fees accounted for 2.2% of Airport Properties revenues in FY 2018, or $15.3 million, and are forecast to decline to $13.4 million in FY 2019. Utility fees are subsequently forecast to dip to $10.8 million in FY 2020 before recovering thereafter, reaching to $15.2 million in FY 2023. These trends reflect (1) the Authority's outlook for changing energy prices over time, as well as (2) a change in the Authority's approach for recovering utility costs leading to a decrease in direct billed utility fees in Terminal B in FY 2020 (such utility fees will be included in the cost recovery calculation for the Terminal B rental rate starting in FY 2020, and recovered through airline rental revenues in Terminal B).

Other. Other revenues accounted for 4.6% of Airport Properties revenues in FY 2018, or $33.1 million (including $2.8 million of tenant aircraft parking revenues), and are forecast to decline to $32.9 million in FY 2019. Other revenues include shuttle bus fees, security checkpoint reimbursement, and other miscellaneous revenues. When tenant aircraft parking (which is part of Logan airline revenues) is excluded, this revenue category is forecast to increase from $30.2 million in FY 2018 to $34.2 million in FY 2023 (a CAGR of 2.5%), primarily driven by an increase in shuttle bus revenues, which reflects the Authority's recently announced initiative to expand and enhance the use of remote parking and busing of passengers to Logan Airport.

Airport Properties Operating Expenses

The Authority incurs operating expenses when maintaining, repairing and operating the Airport Properties. Such expenses generally include salaries and benefits, materials and supplies, repair, maintenance, services, professional fees, utilities, insurance, and other miscellaneous expenses, as well as administrative expenses allocated to the Airport Properties. Operating expenses are allocated to each cost center, including airfield and terminal cost centers, for cost recovery purposes through, in the case of airfield and terminal expenses, the airline rentals and fees.

As shown in Table 3, Airport Properties operating expenses are anticipated to increase by 7.0% from $368.2 million in FY 2018 to $393.7 million in FY 2019. This increase relates to a number of factors including new facilities coming into service and the addition of staff in certain operational areas. Airport Properties operating expenses are forecast to increase at a CAGR of 5.3% from $368.2 million in FY 2018 to $476.0 million in FY 2023.

Logan Airport expenses. In FY 2018, the primary expense allocations for Logan operating expenses were Terminal Building (38.9% of Logan Airport operating expenses), Landing Field (23.0%), Automobile Parking (17.0%), and Non-aeronautical (13.7%). Logan Airport operating expenses are forecast to increase from $343.0 million in FY 2018 to $365.6 million in FY 2019, and to reach $440.6 million in FY 2023, reflecting a CAGR of 5.1% between FY 2018 and FY 2023. The forecast increases reflect changes in baseline expenses, as well as incremental operating expenses for new capital facilities.

Hanscom and Worcester. Hanscom Field and Worcester Regional Airport expenses accounted for 6.8% of total Airport Properties operating expenses in FY 2018, or $25.2 million, and are forecast to increase to $28.1 million in FY 2019. Expenses at Hanscom and Worcester are forecast to increase to $35.5 million in FY 2023, reflecting a CAGR of 7.1% between FY 2018 and FY 2023.

Table 3
ACTUAL AND FORECAST AIRPORT PROPERTIES OPERATING EXPENSES
Massachusetts Port Authority
(For the 12 months ending June 30, $ in thousands)

	Actual			Forecast		
	FY 2018	FY 2019 (a)	FY 2020	FY 2021	FY 2022	FY 2023
Logan Expenses						
Personnel Expenses	$ 142,921	$ 154,150	$ 156,296	$ 162,427	$ 168,267	$ 174,506
Repair & Materials	19,327	19,895	21,805	22,459	23,133	23,827
Services	41,967	43,908	53,050	54,642	56,281	57,970
Professional Fees	47,148	50,365	54,170	55,795	57,469	59,193
Utilities (b)	31,222	30,664	28,788	30,712	36,656	40,456
Other and Authority Wide Allocations	60,388	66,615	73,644	76,307	81,881	84,606
Subtotal: Logan Expenses	$ 342,973	$ 365,597	$ 387,755	$ 402,342	$ 423,687	$ 440,558
Hanscom and Worcester Expenses	25,178	28,146	32,029	33,123	34,301	35,475
Airport Properties Operating Expenses	$ 368,151	$ 393,743	$ 419,783	$ 435,466	$ 457,988	$ 476,033
Percentage change		*7.0%*	*6.6%*	*3.7%*	*5.2%*	*3.9%*
Logan Expenses by Cost Center						
Landing Field	$ 78,742	$ 81,664	$ 85,289	$ 88,526	$ 93,293	$ 97,124
Terminal Building	133,376	143,292	147,351	153,390	168,308	176,280
Automobile Parking	58,320	67,493	70,345	73,042	77,118	80,362
Non-aeronautical (c)	47,023	45,635	56,582	58,021	53,478	53,718
Bag Screening Facilities	12,415	12,413	12,811	13,327	14,197	14,863
Rental Car Center	5,739	7,398	7,586	7,901	8,466	8,888
Airline Support	5,769	6,032	6,060	6,336	6,916	7,328
Regional Carrier and General Aviation Facilities	1,589	1,670	1,731	1,799	1,909	1,994
Logan Expenses by Cost Center	$ 342,973	$ 365,597	$ 387,755	$ 402,342	$ 423,687	$ 440,558

(a) Reflects actual data for the nine months ended March 31, 2019, and budgeted data for the remaining three months of FY 2019.
(b) The increase in utilities expenses between FY 2021 and FY 2022 is attributable to additional facilities and anticipated energy price changes.
(c) In addition to non-aeronautical expenses, also includes other unrecoverable items such as budget contingency. The FY 2020 and future years figures reflect a full year of budget contingency and allowances for potential increases in certain operating expense items.

Source: Massachusetts Port Authority.

THE FY 2019-FY 2023 CAPITAL PROGRAM

The forecast of Airport Properties Net Revenues incorporates the impact on revenues and operating expenses of projects intended to be developed at the Authority's Airport Properties as part of the FY 2019-FY 2023 Capital Program (including projects that are proposed to be funded with the Authority's anticipated future Bonds expected to be issued under the terms of the 1978 Trust Agreement). Other funding sources for projects in the FY 2019-FY 2023 Capital Program include federal grants, PFCs, CFCs, the Authority's internally generated capital, and tenant and third-party financing. The FY 2019-FY 2023 Capital Program for the Authority's Airport Properties is summarized in Table 4. (The Authority's overall program, which includes non-Airport Properties, includes a total of $4.4 billion of projects, $1.8 billion of which are associated with private and third party funded projects.)

Table 4
SUMMARY OF FY 2019-FY 2023 CAPITAL PROGRAM FOR AIRPORT PROPERTIES
Massachusetts Port Authority
($ in thousands)

	Funding Source									
	2019 Bonds (a)	Prior Bonds	Future Bonds (b)	Future Bonds paid from PFCs (c)	PFC Pay-Go	Grants (d)	Authority Capital & Other (e)	Subtotal excluding Private	Private capital	Total
Logan										
Airside										
Runway 9-27 Rehab	$ -	$ -	$ -	$ -	$ 13,800	$ 5,200	$ -	$ 19,000	$ -	$ 19,000
Rehabilitate North Cargo Apron	-	-	-	-	2,342	4,058	-	6,400	-	6,400
Taxiway C3 Pavement Rehab & New Bypass Taxiway	-	-	-	-	7,247	-	-	7,247	-	7,247
Taxiway D, D1, MS Rehab	-	-	-	-	5,600	-	-	5,600	-	5,600
Rehabilitate Taxiways East Alpha & Bravo	-	-	-	-	1,498	1,033	663	3,195	-	3,195
Other Airside Projects	-	173	-	-	1,156	5,722	204,679	211,731	-	211,731
Subtotal: Airside	$ -	$ 173	$ -	$ -	$ 31,642	$ 16,014	$ 205,343	$ 253,172	$ -	$ 253,172
Logan Landside										
Terminal E Modernization - Phase 1	$ 62,763	$ -	$ 283,040	$ 172,601	$ -	$ -	$ -	$ 518,404	$ -	$ 518,404
Terminal C Optimization and B to C Connector	104,292	-	-	40,316	-	-	47,977	192,585	-	192,585
Terminal B Optimization	26,828	51,820	-	-	-	1,649	9,013	89,311	-	89,311
Terminal B to C Roadway Improvements	89,619	-	67,558	-	-	-	31,628	188,804	-	188,804
2,000 Parking Spaces	-	-	107,652	-	-	-	12,000	119,652	-	119,652
Terminal C Canopy and Upper Deck	64,699	-	-	-	-	-	176	64,875	-	64,875
Central Heating Plant Upgrade	-	3,645	-	-	-	-	45,828	49,473	-	49,473
HVAC Equipment Replacement Program	-	4,788	-	-	-	-	25,165	29,953	-	29,953
Other Landside Projects	-	10,383	-	-	-	-	328,419	338,803	120,000	458,803
Subtotal: Landside	$ 348,201	$ 70,635	$ 458,250	$ 212,917	$ -	$ 1,649	$ 500,208	$ 1,591,859	$ 120,000	$ 1,711,859
Logan Other	-	-	-	-	-	-	88,433	88,433	-	88,433
Subtotal: Logan	**$ 348,201**	**$ 70,807**	**$ 458,250**	**$ 212,917**	**$ 31,642**	**$ 17,664**	**$ 793,984**	**$ 1,933,464**	**$ 120,000**	**$ 2,053,464**
Hanscom & Worcester	-	-	-	-	-	20,473	74,890	95,363	29,700	125,063
Total Airport Properties	**$ 348,201**	**$ 70,807**	**$ 458,250**	**$ 212,917**	**$ 31,642**	**$ 38,137**	**$ 868,873**	**$ 2,028,827**	**$ 149,700**	**$ 2,178,527**

(a) Including PFC-related 2019C Bonds expected to be issued to partially fund the Terminal B Optimization project.
(b) Future bonds to be issued under the 1978 Trust Agreement, excluding PFC-related Bonds which are shown in the "Future Bonds paid from PFCs" column.
(c) Future bonds to be issued under the 1978 Trust Agreement, the debt service on which is expected to be paid from PFCs.
(d) Including AIP entitlement and discretionary grants.
(e) Funding from the Authority's Improvement & Extension Fund and Maintenance Reserve Fund, CFCs, and the Terminal A Maintenance Reserve Fund.
Note: Capital expenditures shown in this table reflect spending during the period FY 2019 to FY 2023 only. Spending on certain projects that occurred prior to FY 2019 is not shown in this table.
Source: Massachusetts Port Authority.

In the event that some projects in the FY 2019-FY 2023 Capital Program are not implemented, the associated revenues and operating expenses would not be realized. See the section of Appendix A to the Official Statement titled "Capital Program" for a detailed discussion of the FY 2019-FY 2023 Capital Program costs and funding sources.

PASSENGER FACILITY CHARGES

PFC revenues of the Authority consist of PFCs paid by certain passengers enplaned at the Airport (and include interest income earned thereon). PFC revenues are not Revenues of the Authority as defined in the Authority's 1978 Trust Agreement, and thus, PFCs are not pledged to the payment of debt service on the 2019 Bonds or any of the Authority's other currently outstanding Bonds issued under the 1978 Trust Agreement.

Upon the effective date of certain proposed amendments to the 1978 Trust Agreement (which are expected to be adopted and become effective upon the issuance of the 2019 Bonds), if PFCs or other revenues of the Authority that do not constitute Revenues pledged under the 1978 Trust Agreement (collectively, Available Funds) are pledged or irrevocably committed to or are held by a fiduciary and are to be set aside exclusively for the payment of principal of, interest or premium, if any, on specified Bonds pursuant to a resolution of the Authority (and are not otherwise required for payment of another Series of Bonds), then the principal, interest and/or premium to be paid from such Available Funds or from earnings thereon shall be disregarded and not included in calculating debt service coverage requirements under the 1978 Trust Agreement. As of the date of this report, it is the expectation of the Authority's management that it will annually irrevocably commit PFCs to pay a portion of the principal of and interest on the 2019C Bonds (as well as for the recently issued 2019A Bonds) for the next fiscal year, and this forecast includes that assumption. However, there can be no assurance that the Authority will in fact realize sufficient PFC revenues or irrevocably commit PFCs in such amounts in each such year to the payment of such debt service.

The Authority generated $81.8 million of PFC revenues from activities at Logan Airport during FY 2018, and forecasts $82.6 million of PFC revenues during FY 2019 (including associated restricted interest income). The Authority is forecasting PFC revenues of $87.5 million in FY 2023, a CAGR of 1.4% between FY 2018 and FY 2023, as shown in Table 5.

The Authority has received approval from the FAA to levy a PFC at the $4.50 level per PFC-eligible enplaned passenger at the Airport. The Authority currently has approvals to collect and spend a total of $1.81 billion in PFC revenue under the terms of eleven separate FAA-approved PFC applications (as amended), with a projected PFC charge expiration date of December 1, 2027. PFC revenues are used to fund capital project costs on a pay-as-you-go basis, to pay debt service on a portion of the Authority's recently issued 2019A Bonds and a portion of the 2019C Bonds, and to pay interest and repay principal on commercial paper issued to fund PFC-eligible project costs. From inception of the Authority's PFC program in 1993 through March 31, 2019, a total of $1.26 billion in PFC revenue has been collected by the Authority, including interest income.

Table 5
ACTUAL AND FORECAST PASSENGER FACILITY CHARGE REVENUES
Boston-Logan International Airport
(For the 12 months ending June 30, in thousands except percentages and Net PFC Collection Level)

	Actual	Forecast				
	FY 2018	**FY 2019 (a)**	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**
PFC Revenues						
Enplaned Passengers (b)	19,636	20,814	21,335	21,548	21,764	21,981
Percent of Passengers Paying a PFC	94.0%	90.0%	90.0%	90.0%	90.0%	90.0%
Net PFC Collection Level	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39	$ 4.39
Annual PFC Collections from Airlines	81,016	82,238	84,294	85,137	85,988	86,848
PFC Restricted Interest Income	763	318	894	390	414	650
PFC Revenues Plus Interest Income	$ 81,779	$ 82,556	$ 85,188	$ 85,527	$ 86,401	$ 87,498
Percentage change		*0.9%*	*3.2%*	*0.4%*	*1.0%*	*1.3%*

(a) Reflects actual data for the nine months ended March 31, 2019, and budgeted data for the remaining three months of FY 2019.
(b) Excludes general aviation passengers.

Source: Massachusetts Port Authority.

The Authority expects to initiate its twelfth PFC application in the near future, which will include a request for PFC funding for two projects that are planned to be partially funded with proceeds of the 2019 Bonds – (1) Terminal E Modernization, and (2) Terminal C Optimization and Terminal B to C Connector. The Authority expects to file its twelfth PFC application with the FAA before the end of calendar year 2019.

As noted above, the Authority intends to continue to leverage its PFC revenue stream subject to FAA approval, and currently expects future leveraging of the PFC revenue stream to be partially or wholly undertaken under the terms of the 1978 Trust Agreement, in accordance with the terms of a pending amendment to the 1978 Trust Agreement, as described in Appendix A to the Official Statement for the 2019 Bonds, to which this review is attached.

TENANT AND THIRD PARTY FUNDED PROJECTS

The Authority intends to fund certain capital projects using funds from tenants or third parties, or from revenue sources that are not included in Revenues, as defined in the 1978 Trust Agreement. There are seven such projects in the Authority's FY 2019-FY 2023 Capital Program related to the Airport Properties; two projects at Logan Airport – airline improvements in Terminal C related to the JetBlue expansion ($100 million), and a vendor delivery inspection station by a third party concessionaire

($20 million) – and five projects totaling $29.7 million at Worcester Regional Airport. There are also third party funded projects in the Authority's non-aviation properties. Generally, the Authority would not undertake tenant and third-party projects if funding from those sources was not available.

THE AUTHORITY'S STRATEGIC PLAN

The Authority completed a unified Strategic Plan for all of its facilities, which was adopted by the Board in November 2014. With respect to its Airport Properties, the key goal of the Strategic Plan was to identify the necessary improvements to its airside, landside, and ground access facilities that would allow Logan Airport to serve the needs of its rapidly growing passenger base. Given the robust increase in aviation activity at the Airport since the Strategic Plan was completed, there was a need to embark on a second phase of the Strategic Plan, leading to the implementation of certain of the strategic initiatives identified as part of the planning process on an expedited basis. Several of these initiatives are included in the FY 2019-FY 2023 Capital Program. With respect to Logan Airport, key initiatives include, among others, the implementation of terminal improvements (including additional gates and other improvements to accommodate international activity in Terminal E, and the provision of post-security connectivity for passengers among all Airport terminals), and ground access and curbside improvements at the Airport to accommodate the significant passenger growth.

Authority management and staff will continue to work to develop specific business plans designed to address and implement the strategic initiatives across all of its properties. As detailed business plans for each strategic initiative are developed, refined, and approved in the context of the then-current operating environment and aviation activity levels, those projects will become part of future five-year rolling capital programs to be approved by the Authority's Board.

WORCESTER REGIONAL AIRPORT AND HANSCOM FIELD

The Authority has owned and operated Worcester Regional Airport, a commercial service airport located in Worcester, Massachusetts, since 2010. Prior to that, the Authority was responsible for operating the facility, under ownership of the City of Worcester. While historically this airport has been used for operations ranging from small single-engine aircraft to large corporate business jets, the Authority continues to actively engage in recruiting commercial airlines to the airport. JetBlue commenced scheduled air service at the airport in November 2013, and American Airlines commenced service in October 2018. In addition, Delta Air Lines has announced its planned service from Worcester anticipated to begin in August 2019.

Hanscom Field, located principally in the Town of Bedford, Massachusetts, is a general aviation reliever airport for Logan Airport. The Authority has owned and operated Hanscom Field since 1974.

Taken together, Worcester Regional Airport and Hanscom Field accounted for approximately 2.3% of the Authority's Airport Properties revenues and 6.8% of its Airport Properties operating expenses in FY 2018.

SUMMARY OF FORECAST

Exhibit A presents forecast Airport Properties Revenues and operating expenses, the resultant forecast of Airport Properties Net Revenues for FY 2019 through FY 2023, and the key assumptions that are significant to the forecasts, as prepared by Authority management. These forecasts assume that the airlines currently providing significant levels of service at the Airport will continue to provide uninterrupted service during the forecast period. The forecasts shown in Exhibit A are consistent with the sections of the table entitled "Forecasted Operating Results and Debt Service Coverage Under the 1978 Trust Agreement" (as included in the "Selected Financial Data" section of Appendix A to the Official Statement), which relate to Airport Properties revenues and operating expenses. The information presented in Exhibit A is at a greater level of detail than that presented in the Official Statement, and separately presents information for the Airport, Hanscom Field, and Worcester Regional Airport. Additionally, Exhibit A relates only to the Authority's Airport Properties, while the table in the Official Statement encompasses all of the Authority's properties. To the extent that line items differ between Exhibit A and the Authority's table in Appendix A with respect to the Airport Properties, such variance is due to differences in the methods used to aggregate revenues and operating expenses.

The Authority prepared these financial forecasts on the basis of information and assumptions that were assembled by the Authority. As discussed earlier, LeighFisher assisted the Authority in formulating certain assumptions and developing the forecasts of Airport Properties Net Revenues. The forecasts reflect the Authority's expected course of action during the forecast period and, in the Authority's judgment, based upon the assumptions described herein, present fairly the Authority's forecast financial results of the Airport Properties; however, there can be no assurance that such forecast results will be realized.

In addition to the payment of debt service on the Authority's Bonds issued under the terms of the 1978 Trust Agreement, the Authority is required to make deposits to the PILOT Fund and the Maintenance Reserve Fund and to pay subordinate debt service on private placement debt issued to fund: (1) the acquisition of certain parcels of land, and (2) the development of certain of the Authority's Port properties, as well as make principal and interest payments on the Authority's outstanding commercial paper notes. These amounts must be paid from the Net Revenues of the Airport Properties and other facilities. Our review does not address the amount of such payments nor assess the adequacy of the Authority's forecast Net Revenues to make such payments, as they are subordinate to the payment of debt service on the 2019 Bonds and the Authority's other Bonds issued under the terms of the 1978 Trust Agreement.

SENSITIVITY TEST

To test the sensitivity of the financial forecasts to hypothetical lower levels of air traffic activity, the Authority developed a sensitivity analysis projection in addition to the base forecast. The sensitivity analysis projection should not be considered a forecast of expected future results.

Exhibit B presents a summary of projected Aviation Properties Net Revenues under the hypothetical assumption that total passenger numbers decrease by 18.1% in FY 2021 compared with the prior year, with a subsequent rebound over the next two years – a 2.1% increase in FY 2022, followed by an 8.7% increase in FY 2023. This is proportionate to the trend actually experienced at the Airport between FY 2001 and FY 2004, in the aftermath of the terrorist attacks on September 11, 2001. Passenger activity at the Airport has followed this general trend of quickly rebounding following a sharp decline in each of the last three economic downturns – the economic recessions of the early 1990s, the early 2000s, and 2008-09.

All other assumptions under this sensitivity test are the same as those under the base forecast, including the assumption that annual operating expenses do not change from those in the base forecast. Under the sensitivity test, Airport Properties Net Revenues are projected to be 15.3% below the base forecast level in FY 2021, 12.9% below the base forecast level in FY 2022, and 8.2% below the base forecast level in FY 2023. While airline revenues are approximately the same due to the cost recovery nature of the airline ratemaking methodology used at the Airport, the nonairline revenues that are based on passenger throughput (such as terminal concessions, parking, and rental car) are lower.

It should be noted that, in the eventuality that Airport passenger totals drop significantly, the Authority would likely undertake a program of operating cost reductions and potentially increases in Airport rates and charges, as was the case in the aftermath of the September 11, 2001 terrorist attacks.

ASSUMPTIONS UNDERLYING THE FORECASTS

In our opinion, the assumptions underlying the Authority's base case financial forecasts provide a reasonable basis for the forecasts of Airport Properties Net Revenues and we believe that such forecasts appropriately reflect such assumptions. To the best of our knowledge, we believe that the Authority has taken into account all relevant factors material to the Airport Properties Net Revenues forecasts. We offer no opinion with regard to the forecasts of non-Airport Properties Net Revenues.

Any forecast is subject to uncertainties. Inevitably, some assumptions will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material. Neither LeighFisher nor any person acting on our behalf makes any warranty, expressed or implied, with respect to the information, assumptions, forecasts, opinions, or conclusions disclosed in this report. We have no responsibility to update this report for events and circumstances occurring after the date of our review.

* * * * *

We appreciate the opportunity to serve the Authority as the Airport Properties financial consultant on this financing.

Respectfully submitted,

LeighFisher

LEIGHFISHER

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Attachment

KEY ASSUMPTIONS AND FACTORS UNDERLYING FORECAST AIRPORT PROPERTIES REVENUES AND OPERATING EXPENSES

Massachusetts Port Authority

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KEY ASSUMPTIONS AND FACTORS UNDERLYING FORECAST AIRPORT PROPERTIES REVENUES AND OPERATING EXPENSES

Massachusetts Port Authority

EXHIBIT A: BASE FORECAST

Passenger Traffic and Airline Operations

1. The total number of passengers at Boston-Logan International Airport (the Airport) was 39.4 million in FY 2018 (excluding general aviation passengers). Passengers are forecast to total 41.8 million in FY 2019 (based on actual data for the first nine months of FY 2019). Passenger totals are forecast to increase by 6.0% in FY 2019, by 2.5% in FY 2020, and by 1.0% in FY 2021, FY 2022, and FY 2023 to reach approximately 44.1 million passengers in FY 2023, the last year of the forecast period.

2. The airlines currently providing significant levels of service at the Airport (including American, Delta, JetBlue, Southwest, and United) will continue to provide significant service at the Airport. There will be no sudden, significant reduction in passenger levels at the Airport because of airline mergers or liquidations, or for other reasons.

Bond Issuance and Debt Service

3. The Authority's 2019 Bonds are assumed to be issued in the aggregate principal amount of approximately $508.3 million (yielding $467.4 million of net proceeds available to fund project costs), at an interest rate in the range of 5.5% to 6.0%, and with no capitalized interest period.

   A portion of the debt service on the 2019 Bonds is expected to be paid with PFC revenues. Specifically, $46.5 million of 2019C Bond proceeds are expected to be used to fund $42.0 million of PFC-approved costs associated with the Terminal B Optimization project.

4. During the forecast period, two further bond issues under the terms of the 1978 Trust Agreement are assumed to occur to partially fund projects included in the FY 2019-FY 2023 Capital Program:

   – Series 2020 Bonds are assumed to be issued on or about July 1, 2020, in the aggregate principal amount of $491.6 million (yielding $448.2 million of net proceeds available to fund project costs), with a 6.0% interest rate and no capitalized interest. Of this total, $187.9 million of principal amount is expected to be repaid from PFC revenues (providing $169.6 million of net proceeds to pay project costs), subject to FAA approval and Authority Board designation.

   – Series 2021 Bonds are assumed to be issued on or about July 1, 2021, in the aggregate principal amount of $152.0 million (yielding $138.8 million of net proceeds available to fund project costs), with a 6.0% interest rate and no capitalized interest. Of this total, $48.0 million of principal amount is expected to be repaid from PFC revenues (providing $43.3 million of net proceeds to pay project costs), subject to FAA approval and Authority Board designation.

The portion of the 2020 Bond and 2021 Bond proceeds that is expected to be repaid from PFC revenues would be used to fund a portion of two projects – (1) Terminal E Modernization, and (2) Terminal C Optimization and Terminal B to C Connector.

Under the terms of a pending amendment to the 1978 Trust Agreement that has not yet been approved by the required percentage (51%) of bondholders but which is expected to become effective when the 2019 Bond transaction closes, the Authority may undertake future debt issues under the 1978 Trust Agreement using a PFC direct debt service offset structure (i.e., PFC revenues would be used to pay a designated portion of the associated debt service). For purposes of this analysis, as noted above, it was assumed that PFC revenues would be used to pay a portion of the annual debt service associated with the 2019C Bonds and Bond issues to be undertaken in July 2020 and July 2021.

The PFC Program

5. The PFC Program will continue to be implemented in accordance with the Authority's eleven approved PFC applications and its twelfth PFC application, which is currently in the initial stages of preparation and is expected to be filed with the FAA during FY 2020.

6. PFC revenues generated during the forecast period will be sufficient to pay: (1) interest on, and principal of, outstanding commercial paper notes issued to finance certain PFC projects, (2) certain PFC project costs on a pay-as-you-go basis, (3) a portion of the debt service on the Authority's recently issued 2019A Bonds (related to the development of Terminal A), and (4) a portion of the debt service on the 2019C Bonds and Bonds expected to be issued in July 2020 and July 2021, as described above.

7. PFC revenues are not pledged to the payment of debt service on the 2019 Bonds or any other of the Authority's Bonds issued under the 1978 Trust Agreement. Such Bonds are secured by a pledge of the Authority's general Revenues (which exclude PFC revenues). However, the Authority anticipates, and this forecast assumes, that the Authority will continue to apply PFCs to pay a portion of the debt service on the 2019A Bonds in the amount of approximately $8.8 million per year, as well as pay a portion of the debt service on the 2019C Bonds and Bonds expected to be issued in July 2020 and July 2021, subject to FAA approval and Authority Board designation, as described above.

Grants

8. Based on discussions with the FAA, the Authority expects to receive Airport Improvement Program (AIP) entitlement and discretionary funds, and Voluntary Airport Low Emissions (VALE) grants, for all three airports totaling approximately $38.1 million during the FY 2019 to FY 2023 period.

Operating Expenses

9. Operating expenses at the Airport Properties are projected to increase a compound annual growth rate of approximately 5.3% per year during the forecast period – from FY 2018 through FY 2023. The operating expense forecasts account for the impact of projects included in the FY 2019-FY 2023 Capital Program that enter service prior to the end of FY 2023.

Airline Revenues

10. The fees and charges paid by the airlines are primarily calculated on a cost recovery basis, reflecting both allocated capital and operating costs to facilities used by the airlines. The calculation of the landing fee, terminal rental rates for all four terminals, and the checked bag screening fee, will continue to reflect current rate-making practices.

11. The Authority will include allocable asset amortization related to projects in the FY 2019-FY 2023 Capital Program in the airline cost base for computing airline terminal rentals and landing fees.

Nonairline Revenues

12. An increase of $3 in the maximum daily parking rate at all on-Airport facilities is assumed to be implemented on July 1, 2019 (the start of FY 2020), with a further $3 increase on July 1, 2021 (the start of FY 2022). The Authority's Board has already approved these increases. Parking rates at the Authority's off-Airport Logan Express parking lots are assumed to remain unchanged throughout the forecast period.

13. The rental car privilege fee will remain at 10% of annual gross rental car revenues and minimum annual guaranteed payments will remain unchanged.

14. The adjusted fee structure for TNCs operating at the Airport (i.e., $3.25 per pick-up and $3.25 per drop-off) will take effect on October 1, 2019.

15. Terminal concession revenues are assumed to generally increase in line with the increase in passenger enplanements and as a result of price increases, with adjustments for the expected temporary removal of retail space during construction associated with the new concessions agreement with MarketPlace Logan LLC. In addition, for purposes of this analysis, certain increases in per passenger spending on terminal concessions were assumed in connection with the new agreement with MarketPlace Logan LLC for the operation of concessions at all four Airport terminals.

Rental Car Center and the CFC Program

16. The Authority incurs operating and routine maintenance expenses associated with the day-to-day operation of the Rental Car Center. Pursuant to its lease agreements with the rental car companies associated with the development of the Rental Car Center, the Authority collects building and ground rental revenues from the rental car companies operating in the Rental Car Center. The rental car companies also pay Common Airport Transit System (CATS) fees associated with their allocated share of the Authority's terminal-area busing system. The building and ground rental revenues, CATS fees, and the Authority's operating expenses for the Rental Car Center are all Revenues and operating expenses, as the case may be, under the terms of the 1978 Trust Agreement.

17. CFC revenues are not pledged to the payment of debt service on the 2019 Bonds or any other of the Authority's Bonds issued under the 1978 Trust Agreement. Such Bonds are payable from and secured by a pledge of the Authority's general Revenues (which exclude CFC revenues). Conversely, general Revenues of the Authority are not pledged to the payment of debt service on the Authority's bonds issued under the terms of its CFC Trust Agreement.

EXHIBIT B: SENSITIVITY TEST

The underlying assumptions for Exhibit B (Projected Airport Properties revenues and operating expenses under the sensitivity test) are identical to those underlying the forecast shown in Exhibit A; except that annual passenger numbers during FY 2021 to FY 2023 are lower under the sensitivity case. This results in lower Logan Airport annual revenues (and lower annual revenues for the Airport Properties in total) under the sensitivity test than in the base forecast case.

No change in operating expenses is assumed for the sensitivity test, although if a significant reduction in aviation activity at the Airport were to occur, the Authority could implement a program of operating cost reductions as it did in the aftermath of the terrorist attacks of September 11, 2001, and potentially also increase certain categories of Airport rates and charges. Additionally, no deferrals of capital projects were assumed for the sensitivity test.

Exhibit A

BASE FORECAST

FORECAST AIRPORT PROPERTIES NET REVENUES

Massachusetts Port Authority Airport Properties

(for the 12 months ending June 30, passengers and $ in thousands)

The forecasts presented in this exhibit were prepared by Authority management using information from the sources indicated and assumptions described in the accompanying text. Inevitably, some of the assumptions used to develop the Authority's forecasts will not be realized and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the forecast and actual results, and those differences may be material.

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Logan Airport Total Passengers (a)	41,757	42,801	43,229	43,662	44,098
Percentage change	*6.0%*	*2.5%*	*1.0%*	*1.0%*	*1.0%*
Revenues					
Landing Fees	$ 121,844	$ 126,656	$ 131,590	$ 142,860	$ 155,303
Automobile Parking Fees	179,281	182,938	186,841	189,711	190,283
Utility Fees	13,444	10,785	11,506	13,733	15,156
Terminal Rentals (b)	200,376	227,727	238,707	295,380	303,604
Non-Terminal Building & Ground Rents	54,142	54,964	55,804	56,663	57,535
Concessions					
Terminal Concessions	$ 61,201	$ 54,057	$ 58,617	$ 63,137	$ 65,037
Ground Transportation	13,619	20,172	23,733	24,542	25,167
Other Landside Concessions	12,173	11,923	11,949	11,975	12,002
Rental Car	35,300	31,900	32,219	32,541	32,867
Subtotal: Concessions	$ 122,294	$ 118,052	$ 126,518	$ 132,196	$ 135,073
Other (c)	32,908	34,328	35,437	36,321	36,932
Subtotal: Logan Revenues	$ 724,288	$ 755,450	$ 786,402	$ 866,864	$ 893,887
Percentage change		*4.3%*	*4.1%*	*10.2%*	*3.1%*
Hanscom and Worcester Revenues	$ 17,253	$ 16,802	$ 17,284	$ 17,803	$ 18,315
Total Revenues	$ 741,541	$ 772,252	$ 803,686	$ 884,666	$ 912,202
Percentage change		*4.1%*	*4.1%*	*10.1%*	*3.1%*
Operating Expenses					
Logan Expenses (d)	$ 365,597	$ 387,755	$ 402,342	$ 423,687	$ 440,558
Percentage change		*6.1%*	*3.8%*	*5.3%*	*4.0%*
Hanscom and Worcester Expenses	$ 28,146	$ 32,029	$ 33,123	$ 34,301	$ 35,475
Airport Properties Operating Expenses	$ 393,743	$ 419,783	$ 435,466	$ 457,988	$ 476,033
Percentage change		*6.6%*	*3.7%*	*5.2%*	*3.9%*
AIRPORT PROPERTIES NET REVENUES	$ 347,798	$ 352,469	$ 368,220	$ 426,678	$ 436,169
Percentage change		*1.3%*	*4.5%*	*15.9%*	*2.2%*

(a) Excludes general aviation passengers.

(b) Includes Terminal A rental revenues and charges for baggage screening facilities. For FY 2018 and part of FY 2019, a portion of the rental revenues generated from Terminal A are excluded from this line item, as such portion was directed to Terminal A special facility bond debt service and was not part of Revenues under the 1978 Trust Agreement. Subsequent to February 13, 2019, all Terminal A rental revenues are included in this line item, reflecting the issuance of the 2019A Bonds to retire the Terminal A special facility bonds.

(c) Includes subtenant fees, conduit fees, operating grants and other items.

(d) Including expenses for other unrecoverable items, such as budget contingency.

Note: Amounts in the columns may not add to the subtotals and totals because of rounding.

Source: Massachusetts Port Authority.

Exhibit B

SENSITIVITY TEST

PROJECTED AIRPORT PROPERTIES NET REVENUES

Massachusetts Port Authority Airport Properties

(for the 12 months ending June 30, passengers and $ in thousands)

This scenario is based upon hypothetical assumptions as described in the text.

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Logan Airport Total Passengers (a)	41,757	42,801	35,054	35,792	38,909
Percentage change	*6.0%*	*2.5%*	*-18.1%*	*2.1%*	*8.7%*
Revenues					
Landing Fees	$ 121,844	$ 126,656	$ 131,590	$ 142,860	$ 155,303
Automobile Parking Fees	179,281	182,938	151,507	155,888	168,708
Utility Fees	13,444	10,785	11,506	13,733	15,156
Terminal Rentals (b)	200,376	227,727	238,707	295,380	303,604
Non-Terminal Building & Ground Rents	54,142	54,964	55,804	56,663	57,535
Concessions					
Terminal Concessions	$ 61,201	$ 54,057	$ 47,939	$ 52,147	$ 57,210
Ground Transportation	13,619	20,172	19,880	20,798	22,953
Other Landside Concessions	12,173	11,923	11,455	11,499	11,688
Rental Car	35,300	31,900	26,126	26,676	28,999
Subtotal: Concessions	$ 122,294	$ 118,052	$ 105,400	$ 111,121	$ 120,850
Other (c)	32,908	34,328	35,437	36,321	36,932
Subtotal: Logan Revenues	$ 724,288	$ 755,450	$ 729,951	$ 811,966	$ 858,089
Percentage change		*4.3%*	*-3.4%*	*11.2%*	*5.7%*
Hanscom and Worcester Revenues	$ 17,253	$ 16,802	$ 17,284	$ 17,803	$ 18,315
Total Revenues	$ 741,541	$ 772,252	$ 747,235	$ 829,768	$ 876,404
Percentage change		*4.1%*	*-3.2%*	*11.0%*	*5.6%*
Operating Expenses					
Logan Expenses (d)	$ 365,597	$ 387,755	$ 402,342	$ 423,687	$ 440,558
Percentage change		*6.1%*	*3.8%*	*5.3%*	*4.0%*
Hanscom and Worcester Expenses	$ 28,146	$ 32,029	$ 33,123	$ 34,301	$ 35,475
Airport Properties Operating Expenses	$ 393,743	$ 419,783	$ 435,466	$ 457,988	$ 476,033
Percentage change		*6.6%*	*3.7%*	*5.2%*	*3.9%*
AIRPORT PROPERTIES NET REVENUES	$ 347,798	$ 352,469	$ 311,769	$ 371,780	$ 400,371
Percentage change		*1.3%*	*-11.5%*	*19.2%*	*7.7%*

(a) Excludes general aviation passengers.

(b) Includes Terminal A rental revenues and charges for baggage screening facilities. For FY 2018 and part of FY 2019, a portion of the rental revenues generated from Terminal A are excluded from this line item, as such portion was directed to Terminal A special facility bond debt service and was not part of Revenues under the 1978 Trust Agreement. Subsequent to February 13, 2019, all Terminal A rental revenues are included in this line item, reflecting the issuance of the 2019A Bonds to retire the Terminal A special facility bonds.

(c) Includes subtenant fees, conduit fees, operating grants and other items.

(d) Including expenses for other unrecoverable items, such as budget contingency.

Note: Amounts in the columns may not add to the subtotals and totals because of rounding. No changes in assumptions have been made regarding operating expenses, or the timing of the implementation of capital projects.

Source: Massachusetts Port Authority.

APPENDIX E

SUMMARY OF CERTAIN PROVISIONS OF THE 1978 TRUST AGREEMENT

The following summary does not purport to be complete and is subject to all of the terms and conditions of the 1978 Trust Agreement, to which reference is hereby made, the form of which is available for examination at the offices of the Authority and the Trustee. The summary makes use of terms defined in the 1978 Trust Agreement, certain of which are also defined below. The summary includes the effect of the expected issuance of the 2019 Bonds on July 17, 2019 and the proposed amendments to the 1978 Trust Agreement set forth in the Twenty-First Supplemental Agreement that are expected to become effective on the date of issuance of the 2019 Bonds, when the holders of 51% in the aggregate principal amount of the Bonds outstanding on such date will have approved and consented to the amendments to the 1978 Trust Agreement as set forth in such Twenty-First Supplemental Agreement. The proposed amendments to the 1978 Trust Agreement pursuant to the Twenty-First Supplemental Agreement are shown in italics and underlined and indicated by footnotes contained herein.

Pledge Effected by the 1978 Trust Agreement (Sections 701, 601, 507 and 507A)

Payment of the principal, interest and redemption premium on the Bonds is secured by a pledge of the Revenues, in the manner and to the extent set forth in the 1978 Trust Agreement. See "SECURITY FOR THE 2019 BONDS -- General." The Enabling Act provides that the Authority is authorized in the 1978 Trust Agreement to pledge its tolls and other revenues, over and above the amounts necessary to pay current expenses and to provide reserves therefor, to the payment of the interest on and principal of its Bonds. The Enabling Act further provides that such pledge is valid and binding when made, and that the revenues so pledged shall immediately be subject to the lien of such pledge without physical delivery thereof or further act, and such lien shall be valid and binding as against all parties having claims of any kind irrespective of whether such parties have notice thereof. The Bonds issued under the 1978 Trust Agreement are not a debt or obligation of the Commonwealth or of any political subdivision thereof but are payable solely from the Revenues pledged for their payment and certain Funds and Accounts created by the 1978 Trust Agreement.

The 1978 Trust Agreement provides that the moneys in all Funds and Accounts which are held by the Authority shall be subject to a lien and charge in favor of the Trustee and the holders of the Bonds to the same extent as provided with respect to moneys deposited with the Trustee. All moneys deposited with the Trustee as required by the 1978 Trust Agreement shall be held by the Trustee in trust and applied as provided in the 1978 Trust Agreement and, pending such application, shall be subject to a lien and charge in favor of the Trustee and the holders of the outstanding Bonds on the terms and conditions set forth therein until disbursed.

The 1978 Trust Agreement provides that amounts, if any, deposited in a separate account of the Operating Fund created under the 1978 Trust Agreement which represent payments in respect of pension obligations of the Authority will, upon the occurrence of an event of default under the 1978 Trust Agreement, first be applied to present and accrued pension benefits of the Authority's employees. The 1978 Trust Agreement further provides for the payment of the Authority's obligations in respect of post-retirement health benefits to a separate trustee or into a separate account of the Operating Fund. Amounts, if any, deposited in such separate account will, upon the occurrence of an event of default under the 1978 Trust Agreement, first be applied to present and accrued post-retirement health benefits of the Authority's employees.

Establishment of Funds and Accounts (Sections 503, 209 and 401)

The 1978 Trust Agreement creates a Revenue Fund, an Operating Fund (which includes a separate Self-Insurance Account, and may include a separate pension account and a separate post-retirement health benefits account), an Interest and Sinking Fund (which includes three separate accounts, namely, a Bond Service Account, a Redemption Account and a Reserve Account *(which includes a Pooled Reserve Subaccount and one or more additional subaccounts established by resolution of the Authority)*[1], and one or more Term Bond Investment Accounts established by resolution of the Authority for a subsequent Series of Bonds), a Maintenance Reserve Fund, a Payment in Lieu of Taxes Fund, a Capital Budget Fund and an Improvement and Extension Fund (which includes such other accounts as the Authority may from time to time establish). The Authority has established within the Improvement and Extension Fund separate Rebate Funds pertaining to each Series of Bonds, separate principal, interest and escrow accounts relating to subordinated debt financings of the Authority, and payment and rebate accounts relating to the tax-exempt commercial paper program of the Authority pursuant to separate resolutions.). The 1978 Trust Agreement also provides for a Construction Fund and for separate Project Accounts within such Fund.

The Authority holds and administers in trust the Revenue Fund, the Operating Fund (except the Self-Insurance Account, the pension account and the post-retirement health benefits account) and the Improvement and Extension Fund. All of the other Funds and Accounts are held and administered by the Trustee.

Application of Revenues

Under the 1978 Trust Agreement all Revenues are to be deposited, daily as far as practicable, into the Revenue Fund held by the Authority.

Operating Fund (Section 506) -- As often as practicable the Authority shall transfer from the Revenue Fund to the Operating Fund all Revenues on deposit therein. The Authority will pay when due all Operating Expenses from the Operating Fund.

On the seventh business day of each month the Authority is required to make transfers from the moneys on deposit in the Operating Fund as follows:

> to the trustee of the Authority's pension plan, one-twelfth (1/12) of the Authority's actuarially determined annual pension expense;
>
> to a separate trustee or to a special separate post-retirement health benefit account, one-twelfth (1/12) of the Authority's actuarially determined annual post-retirement health expense; and

[1] Language related to the Pooled Reserve Subaccount to be added upon effective date of the Twenty-First Supplemental Agreement.

to the Trustee for deposit in the Self-Insurance Account, amounts substantially as recommended by the Authority's Risk Management Consultant.

After (x) paying Operating Expenses, (y) making any required transfers to the trustee of the Authority's pension fund, to the trustee for the Authority's post-retirement health benefit account and to the Trustee for deposit in the Self-Insurance Account, and (z) retaining in the Operating Fund such amount as the Authority may deem necessary (provided that the balance retained therein does not exceed 15% of annual Operating Expenses established in the Annual Budget of the Authority), the Authority is required on the seventh business day of each month to transfer the balance in the Operating Fund to the Trustee for deposit in the following Funds and Accounts in the following order (no transfer to be made into any Fund or Account until there shall have been deposited in the next preceding Fund or Account the full amount required):

(1) Interest and Sinking Fund (Sections 510 and 522) -- Amounts in this Fund will be applied to the payment of the Bonds and any additional Bonds which may be issued in the future. Such Bonds which may be issued in the future are hereinafter referred to as "Additional Bonds".

Bond Service Account: There shall be deposited in this Account the amount needed to make the sum therein, together with any amounts transferred from the Construction Fund *or Available Funds deposited for the payment of a Series of Bonds pursuant to the 1978 Trust Agreement*[2] equal to (a) interest accrued and to accrue until the first day of the next month on all outstanding 2008 Bonds, 2010 Bonds, 2012 Bonds, 2014 Bonds, 2015 Bonds, 2016 Bonds, 2017 Bonds, 2019A Bonds, 2019 Bonds and any Additional Bonds, plus (b) principal accrued and to accrue until the first day of the next month on all serial 2008 Bonds, serial 2010 Bonds, serial 2012 Bonds, serial 2014 Bonds, serial 2015 Bonds, serial 2016 Bonds, serial 2017 Bonds, serial 2019A Bonds, serial 2019 Bonds and any serial Additional Bonds, which will become payable within the next year.

Redemption Account: There shall be deposited in this Account the amount needed to make the amount deposited therein equal to the Amortization Requirements, if any, for such fiscal year on all outstanding term 2008 Bonds, term 2010 Bonds, term 2012 Bonds, term 2014 Bonds, term 2015 Bonds, term 2016 Bonds, term 2017 Bonds, term 2019A Bonds, term 2019 Bonds and any term Additional Bonds accrued and to accrue until the first day of the next month, plus an amount equal to any premium which would be payable on any date commencing with July 2 in such fiscal year and ending with July 1 in the following fiscal year, both inclusive, accrued or to accrue until the first day of the next month *less the amount of Available Funds deposited in the Redemption Account for the payment of a Series of Bonds pursuant to the 1978 Trust Agreement*.[3] If the balance remaining after making the deposit to the Bond Service Account shall not be sufficient to make the deposits into the Redemption Account and the Term Bond Investment Account, described below, the amount to be deposited in each Account shall be pro-rated in accordance with the respective amounts required.

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[2] Offset of Available Funds to be added upon effective date of the Twenty-First Supplemental Agreement.
[3] Offset of Available Funds to be added upon effective date of the Twenty-First Supplemental Agreement.

Term Bond Investment Account: The 1978 Trust Agreement allows the Authority to provide for the payment of the principal of Additional Bonds issued as term Bonds through establishment of a Term Bond Investment Account. If a Term Bond Investment Account is established, monthly amounts would be deposited therein and invested in Government Obligations in accordance with the resolution authorizing such term Additional Bonds. No Term Bond Investment Account was established for any Series of outstanding Bonds, and none will be established for the 2019A Bonds.

Reserve Account:[4] *Within the Reserve Account there is hereby created the "Pooled Reserve Subaccount" and one or more additional subaccounts hereafter established by resolution of the Authority*. Upon issuance of any Bonds there shall be deposited in the Reserve Account an amount at least equal to one-half of the difference between (a) the increase in the maximum annual Principal and Interest Requirements on such Bonds and all then-outstanding Bonds, and (b) the amount, if any, in the Reserve Account in excess of the maximum annual Principal and Interest Requirements on all then-outstanding Bonds. *Following the effective date of the Twenty-First Supplemental Agreement, the Authority shall deposit into the Pooled Reserve Subaccount from the proceeds of any Series of additional Bonds secured by such subaccount, or from such other moneys of the Authority as may be available and which the Authority elects to apply for such purpose, an amount at least equal to one-half the amount equal to* (a) the increase in the maximum annual Principal and Interest Requirements on such Bonds and all then-outstanding Bonds secured by such subaccount, and (b) the amount, if any, in the Reserve Account in excess of the maximum annual Principal and Interest Requirements on all then-outstanding Bonds secured by such subaccount. In addition, there shall be deposited in this Account each month a sum equal to one-sixtieth of the difference between (a) the maximum annual Principal and Interest Requirements for any fiscal year thereafter on account of all Bonds then outstanding, less (b) the sum of (x) the amount so deposited into the Reserve Account upon the issuance of such Bonds, and (y) any amount in the Reserve Account in excess of the maximum annual Principal and Interest Requirements on all then-outstanding Bonds prior to the issuance of such Bonds. If the amounts held on deposit in the Reserve Account exceed the maximum Principal and Interest Requirements for any fiscal year on account of all Bonds then outstanding, the excess shall be transferred to the Improvement and Extension Fund.

Prior to the authentication and delivery of any Series of Bonds, the Authority shall adopt a resolution which shall specify or shall delegate, within specified parameters to an authorized officer of the Authority, the ability to determine the Reserve Requirement, if any, with respect to such Series of Bonds to be deposited in or credited to a subaccount in the Reserve Account with respect to such Series of Bonds designated by such resolution and any other terms with respect to the funding of such Reserve Requirement.

There may be created within the Reserve Account by the resolution of the Authority authorizing a Series of Bonds a separate subaccount for such Series of Bonds;

[4] Amendments regarding the Reserve Fund and Reserve Requirement to be added upon effective date of the Twenty-First Supplemental Agreement.

provided that (i) the Authority may elect in such resolution that any then-existing subaccount within the Reserve Account (including without limitation the Pooled Reserve Subaccount) shall secure such additional Series of Bonds on a parity basis (if permitted by the resolution of the Authority which established such subaccount); and (ii) with respect to any Series of Bonds, the Authority may elect in the resolution that such Series of Bonds shall not be secured by any subaccount in the Reserve Account and, accordingly, not to establish any subaccount in the Reserve Account to secure such Series of Bonds. Any resolution of the Authority providing for the issuance of a Series of Bonds which establishes a separate subaccount within the Reserve Account shall specify (a) whether such subaccount shall secure only such Series of Bonds or may secure additional Series of Bonds and (b) the Reserve Requirement applicable to such subaccount.

The Authority shall not be required to fully fund a subaccount in the Reserve Account at the time of issuance of a Series of Bonds, if it elects, by the resolution of the Authority authorizing issuance of such Series of Bonds, to fully fund the applicable subaccount in the Reserve Account over a period specified in such resolution, not to exceed sixty (60) months, commencing with the next succeeding fiscal year of the Authority, during which it shall make substantially equal monthly installments in order that the amounts on deposit therein at the end of such period shall equal the Reserve Requirement for such Series of Bonds.

In lieu of making deposits to the Reserve Account as and at the times required by the 1978 Trust Agreement, the Authority, at its option, may satisfy all or any portion of such deposit requirement by providing to the Trustee (a) an irrevocable, unconditional letter of credit issued by a bank, savings and loan association or other provider of such letters of credit whose long-term obligations are rated in one of the two highest rating categories by Moody's Investors Service and Standard & Poor's, or (b) an insurance policy providing substantially equivalent liquidity as an irrevocable, unconditional letter of credit and issued by a municipal bond or other insurance company that is of sufficient credit quality to entitle debt backed by its insurance policy or surety bond to be rated in one of the two highest rating categories by Moody's Investors Service and Standard & Poor's.

(2) Maintenance Reserve Fund (Section 510) -- There shall be deposited each month in this Fund an amount equal to one-twelfth of 1% of the Replacement Cost of all Projects of the Authority as determined by the Consulting Engineer for the then current fiscal year, or such greater amount as may have been specified in the Annual Budget for such fiscal year; provided that the amount on deposit in the Maintenance Reserve Fund and not theretofore obligated shall not exceed 5% of the Replacement Cost of all Projects of the Authority.

(3) Payment in Lieu of Taxes Fund (Section 510) -- There shall be deposited in this Fund the amount required to make the balance in this Fund equal to the cumulative amount which should then be on deposit therein assuming the amounts payable in lieu of taxes on the next following payment dates were paid in equal monthly installments from the preceding payment dates under any agreements entered into pursuant to authorizing legislation.

(4) Capital Budget Fund (Sections 510 & 517A) -- There shall be deposited in this Fund amounts necessary to provide for the Capital Budget in each fiscal year as determined by the Authority less amounts thereof already expended plus all amounts in the Capital Budget Fund obligated with respect to prior fiscal years but not yet expended, subject to increase or reduction by resolution of the Authority. Amounts may be withdrawn from the Capital Budget Fund for expenditure in accordance with the Capital Budget or as otherwise determined by the Authority.

(5) Improvement and Extension Fund (Sections 510 & 518) -- Any balance of moneys in the Operating Fund after making required transfers to the Trustee for the above Funds and Accounts will be transferred to the Improvement and Extension Fund. Amounts may be withdrawn from the Improvement and Extension Fund for any lawful purpose of the Authority.

Application of Funds and Accounts

Operating Fund (Section 506) -- Operating Expenses, as determined in the Authority's Annual Budget, are paid from this Fund. Amounts deposited in the Self-Insurance Account in the Operating Fund are to be used to pay uninsured or self-insured losses.

Interest and Sinking Fund (Sections 511, 512, 514 and 519) -- Moneys in the Bond Service Account shall be applied to the payment of interest on the Bonds and any Additional Bonds and the principal amount of any Bonds and any Additional Bonds as the same become due.

Moneys in the Redemption Account shall be applied to the purchase (at not more than the current redemption price unless another price is set by the Authority) or redemption of the Bonds and any Additional Bonds. Unless previously applied to purchase Bonds and any Additional Bonds, the Trustee shall apply moneys in such Account to meeting Amortization Requirements of the Bonds or any Additional Bonds on each July 1 when due. Moneys deposited in the Redemption Account shall be applied, first, to the purchase or redemption of term Bonds and any term Additional Bonds of each Series outstanding to the extent of their respective Amortization Requirements for the then current fiscal year plus the applicable premium, if any, and thereafter, at the option of the Authority, to the purchase or redemption of Bonds and any Additional Bonds.

Moneys in the Term Bond Investment Account, if such an account shall be created, shall be applied in the retirement of any applicable Series of term Additional Bonds required to be redeemed by either redemption or, at the direction of the Authority, by purchase at a price not exceeding the next applicable redemption price, or to the purchase of Government Obligations to be applied on the maturity date to payment of such Additional Bonds.

Moneys in *each subaccount within*[5] the Reserve Account shall be used by the Trustee to pay interest, principal of any serial Bonds, and Amortization Requirements with respect to term Bonds, or to make deposits to a Term Bond Investment Account, whenever and to the extent that the Bond Service Account and the Redemption Account or the Term Bond Investment Account are insufficient for such purposes.

[5] Language related to subaccounts to be added upon effective date of the Twenty-First Supplemental Agreement.

If at any time after so applying *the applicable subaccount within*[6] the Reserve Account, moneys held in the Bond Service Account or the Redemption Account of the Interest and Sinking Fund shall be insufficient for the payment of the principal or premium of, or interest or Amortization Requirements on the Bonds and any Additional Bonds as the same become due, such insufficiency shall be made up by transfers from the Improvement and Extension Fund, the Capital Budget Fund, the Payment in Lieu of Taxes Fund and the Maintenance Reserve Fund, in that order.

Maintenance Reserve Fund (Section 516) -- Moneys in this Fund are to be applied to pay for (i) renewals, reconstruction and replacement of any facilities of the Authority, (ii) acquiring and installing or replacing equipment, (iii) unusual or extraordinary maintenance or repairs, (iv) repairs or replacements for which the proceeds of insurance are inadequate, and (v) transfers to the Bond Service Account and Redemption Account when these Accounts are insufficient to pay the principal or premium, or interest or Amortization Requirements on the Bonds and any Additional Bonds, or for making required deposits to any Term Bond Investment Account, as they become due.

Payment in Lieu of Taxes Fund (Section 517) -- Moneys in this Fund will be used to make payments in lieu of taxes pursuant to agreements entered into by the Authority pursuant to statute or, as provided in the 1978 Trust Agreement, payment of a shortfall in debt service on the Bonds.

Capital Budget Fund (Section 517A) -- Moneys in this Fund are to be disbursed in accordance with any Capital Budget adopted by the Authority. Amounts in this Fund may be withdrawn to the extent not previously obligated. The Authority may transfer amounts from the Improvement and Extension Fund to this Fund as it sees fit.

Improvement and Extension Fund (Section 518) -- Moneys in this Fund may be used by the Authority for any lawful purpose, including, without limitation, transfer to any other Fund or Account. The resolutions of the Authority pertaining to each outstanding Series of Bonds created within the Improvement and Extension Fund as segregated accounts separate Rebate Funds for such Bonds, each to be held for the sole benefit of the United States of America. Excess Earnings (as defined in such resolutions) will be deposited in Rebate Funds and used exclusively to make rebate payments to the United States of America. To the extent of any deficiency in any Rebate Fund, such payments will be made out of the Operating Fund and other available moneys of the Authority.

If then permitted by law, moneys held for the credit of the Improvement and Extension Fund may be pledged to the payment of principal of and interest on notes or other obligations issued for any purpose for which moneys in such Fund may be disbursed. The Improvement and Extension Fund or portions thereof have been and may be pledged to secure certain obligations of the Authority. See "APPENDIX A– Other Obligations—Subordinated Indebtedness" and "–Commercial Paper."

[6] Language related to subaccounts to be added upon effective date of the Twenty-First Supplemental Agreement.

Covenants as to Fees and Charges (Section 501)

In the 1978 Trust Agreement the Authority covenants:

To charge such tolls, rates, fees, rentals and other charges as from time to time may be necessary so that the Revenues in each fiscal year will at least equal in such fiscal year the greater of (a) an amount sufficient to provide funds for Operating Expenses for such fiscal year plus an amount equal to 125% of Principal and Interest Requirements on all outstanding Bonds during such fiscal year (excluding capitalized interest payable from the Construction Fund), or (b) an amount sufficient to provide funds for Operating Expenses for such fiscal year, to pay principal of, interest on and redemption price, if any, on all outstanding Bonds as required by the 1978 Trust Agreement (less capitalized interest paid from the Construction Fund *and Available Funds deposited as provided in the 1978 Trust Agreement*)[7], to make required deposits to the Maintenance Reserve Fund, the Payment in Lieu of Taxes Fund and the Capital Budget Fund, and to provide amounts required to be deposited to the Improvement and Extension Fund pursuant to any supplement to the 1978 Trust Agreement which may be entered into by the Trustee and the Authority providing for the issuance of separately secured obligations.

If in any year the Revenues shall be less than the amounts required by the preceding paragraphs, the Authority, before the first day of October of the following fiscal year, will cause recognized experts, other than the Consulting Engineers, in the field of estimating revenues of a facility or element of a facility to which the recommendations relate, to recommend revised schedules of tolls, rates, fees, rentals and other charges; and if the Authority shall comply with all such recommendations, the failure of Revenues to equal the amounts specified in the preceding paragraph will not of itself constitute an event of default under the 1978 Trust Agreement.

Before placing in operation any Additional Facilities financed by a Series of Bonds, to fix and place in effect tolls, rates, fees, rentals and other charges in substantial conformity with those anticipated by the recognized experts in estimating the Revenues of such Additional Facilities in connection with the issuance of such Series of Bonds.

Before placing in operation any Additional Improvements financed by a Series of Bonds for the use of which a charge would ordinarily be made, to place in effect with respect thereto tolls, rates, fees, rentals and other charges in substantial conformity with those anticipated by the recognized experts in estimating the Revenues of the Project to which such Additional Improvements relate in connection with the issuance of such Series of Bonds.

To place in effect on the date or dates specified any increase in rates and charges that have been adopted by the Authority and taken into account by the recognized experts who estimated Revenues in connection with the issuance of an additional Series of Bonds, provided that such increase need not be imposed in the event that the Secretary-Treasurer certifies in writing, confirmed by certificates of such recognized experts, that such additional Series of Bonds could then be issued under the provision of the 1978 Trust Agreement that permitted the issuance of such additional Series of Bonds.

[7] Offset of Available Funds to be added upon effective date of the Twenty-First Supplemental Agreement.

Issuance of Additional Bonds (Sections 209 and 210)

The 1978 Trust Agreement permits the issuance of Additional Bonds for the purpose of financing costs incident to any Additional Improvements or Additional Facilities and of refunding outstanding Bonds and subordinated obligations of the Authority. Such Additional Bonds may be issued only if, at the time of such issuance, there is no existing default under the 1978 Trust Agreement and certain projected or historical earnings tests are met. Such tests are to be based on information with respect to the Additional Improvements or Additional Facilities provided by recognized experts (as to estimated future Revenues), by the Consulting Engineers *or a Consultant*[8] (as to cost and estimates of funds available to pay such cost, completion date, date on which such Additional Facilities or Additional Improvements will be placed in operation, and estimated future Operating Expenses), and by the Authority (as to historical financial information, estimated investment earnings and the Principal and Interest Requirements on the Additional Bonds). Certificates must be filed with the Trustee showing compliance with the following requirements:

A. If the Additional Bonds are issued to finance all or the first portion of the estimated cost of Additional Improvements, (i) Net Revenues in any twelve consecutive months of the last 18 months were at least 125% of the Principal and Interest Requirements on all Bonds outstanding during such twelve months, and (ii) the estimated average annual Net Revenues for the three fiscal years commencing immediately following the latest estimated date of placing in operation any Additional Improvements or Additional Facilities for which any Series of Bonds has been or is then being issued will be at least 130% of the estimated maximum Principal and Interest Requirements in any year thereafter on account of all Bonds to be outstanding, including the estimated amount of Bonds to be issued in the future to complete such Additional Improvements or Additional Facilities.

B. If the Bonds issued under Paragraph A were issued to finance only the first portion of the estimated cost of Additional Improvements, subsequent Bonds may be issued to finance the cost of such Additional Improvements upon compliance with a test comparable to that set forth in clause (ii) of Paragraph A modified by changing the percentage contained therein to 125%.

C. If the Bonds are issued to finance all or the first portion of the estimated cost of Additional Facilities, the applicable test is comparable to that set forth in Paragraph A modified by changing the percentage in clause (ii) of Paragraph A to 140%.

D. If the Bonds issued under Paragraph C are issued to finance only the first portion of the estimated cost of Additional Facilities, subsequent Bonds may be issued to finance the cost of such Additional Facilities upon compliance with a test comparable to that set forth in clause (ii) of Paragraph A modified by changing the percentage contained therein to 135%.

[8] Option for "a Consultant" to be added upon effective date of the Twenty-First Supplemental Agreement.

E. Notwithstanding Paragraphs A, B, C and D, if the Additional Bonds are being issued to finance all or any portion of the estimated cost of Additional Improvements or Additional Facilities, they may be issued if Net Revenues in any twelve consecutive months of the last 18 months were at least 125% of the maximum annual Principal and Interest Requirements on all outstanding Bonds, the Bonds then being issued and any subsequent Additional Bonds estimated to be issued to complete Additional Improvements or Additional Facilities for which a Series of Additional Bonds has been issued under Paragraph A or C. In addition to the statement by the Consulting Engineers *or a Consultant* described above, the Authority is required to file the certificate of the Consulting Engineers *or a Consultant* described below under "Restrictions on Certain Additional Facilities".[9]

F. If Bonds are issued under Paragraph A or C to finance all of the then estimated cost of Additional Improvements or Additional Facilities, an additional Series of Bonds to complete such Additional Improvements or Additional Facilities may be issued without compliance with any of the tests in the paragraphs above.

With respect to any Additional Bonds which bear interest at a variable rate or a rate which is otherwise not subject to definite determination over the period of any calculation required by the 1978 Trust Agreement, all provisions of the 1978 Trust Agreement which require use of a definite interest rate for purposes of any calculation shall be applied as if the interest rate for such Additional Bonds were the rate estimated by a nationally known investment banking firm, selected by the Authority (which firm may be an owner or underwriter of any Bonds), to be the rate at which such Additional Bonds would bear interest if they were issued at par and bore a fixed rate for the entirety of their term. The provisions of the 1978 Trust Agreement requiring any calculation shall be applied to Additional Bonds which accrue and compound interest for all or any portion of the term thereof as if interest accrued during such period in the manner provided in such Additional Bonds. Any Additional Bonds may accrue interest at such rate or rates as are determined in accordance with the resolution of the Authority providing for their issuance and such interest may be payable on such date or dates, which may be other than January 1 and July 1, as are set forth in such resolution.

Issuance of Refunding Bonds (Sections 209 and 212)

Under the 1978 Trust Agreement the Authority may issue Additional Bonds for the purpose of refunding all or any part of the outstanding Bonds of any one or more issues or series then outstanding and paying issuance costs.

Such refunding Bonds may be issued only if one of the following conditions is met: (i) the Principal and Interest Requirements on account of all Bonds for each fiscal year until the year following the fiscal year in which any non-refunded Bonds mature are not increased by reason of the refunding, (ii) the Net Revenues of the Authority during any twelve consecutive months out of the most recent 18-month period were not less than 125% of the maximum annual Principal and Interest Requirements for any fiscal year thereafter (giving effect to the refunding and any Bonds to be issued for the completion of Additional Improvements and Additional

[9] Option for "a Consultant" to be added upon effective date of the Twenty-First Supplemental Agreement.

Facilities); or (iii) (a) the Net Revenues during any twelve consecutive months out of the most recent 18-month period were at least 125% of the Principal and Interest Requirements on all outstanding Bonds during such twelve months, and (b) the estimated average annual Net Revenues for the three fiscal years commencing immediately following the latest estimated date of placing in operation any Additional Improvements or Additional Facilities for which any series of Bonds has been issued will be at least 135% of the estimated maximum Principal and Interest Requirements for any year (giving effect to the refunding and any Bonds to be issued for the completion of Additional Improvements and Additional Facilities).

Issuance of Other Obligations (Section 216)

The 1978 Trust Agreement permits the Authority to issue obligations for any lawful purpose which are not secured by any pledge on, nor payable from, the Revenues or any of the Funds and Accounts created by the 1978 Trust Agreement.

The 1978 Trust Agreement permits the Authority, if permitted by law, to issue notes or other obligations for any purposes (as described above) for which Additional Bonds may be issued and to pledge moneys held for the credit of the Improvement and Extension Fund to the payment of principal and interest of such notes or other obligations which have been issued for any purpose for which the moneys held for the credit of such Fund may be disbursed. The Authority may also issue notes payable solely from the proceeds of the issuance of Additional Bonds or other permitted borrowing.

The 1978 Trust Agreement also provides that the Authority may issue obligations the principal of and redemption premium, if any, and interest on which is payable from and secured by a pledge of and lien on the Revenues junior and subordinate to those created by the 1978 Trust Agreement for the benefit of the Bondholders, provided that such obligations shall be payable solely from moneys in the Improvement and Extension Fund, from additional issues of such subordinate obligations, or, if such obligations were issued for purposes for which Additional Bonds could have been issued, from the proceeds of Additional Bonds thereafter issued.

Construction Fund (Article IV)

Under the 1978 Trust Agreement, the proceeds of all Additional Bonds or Notes issued to provide funds to pay the cost of Additional Improvements or Additional Facilities are to be deposited in separate Project Accounts within the Construction Fund. The Construction Fund is held by the Trustee. There may also be deposited in the appropriate Project Accounts other moneys received from any other source for the construction of Additional Improvements or Additional Facilities. Except for payments to cover interest on any Additional Bonds through the second interest payment date after completion of construction of the last of the Additional Improvements or Additional Facilities financed therewith (to the extent such interest payments are called for by the resolution of the Authority authorizing the issuance of such Additional Bonds), payments may be made only upon filing with the Trustee a requisition properly executed on behalf of the Authority and accompanied by an approving certificate of the Consulting Engineers <u>*or a Consultant*</u> and a certificate of the Authority to the effect that the obligations which are the subject of the requisition are due and payable. Any balance remaining in the appropriate Project Account in the Construction Fund upon completion of the Additional Improvements or Additional Facilities funded with a particular Series of Bonds not reserved by the Authority with the approval of the Consulting Engineers *or a Consultant* for the payment of any remaining cost thereof shall be transferred to the Improvement and Extension Fund.[10]

Completion of Projects (Section 702)

The Authority covenants that forthwith after the issuance of any Series of Additional Bonds to finance Additional Improvements or Additional Facilities it will proceed with the construction or acquisition of such Additional Improvements or Additional Facilities. Such construction will be in accordance with plans approved by the Consulting Engineers *or a Consultant*.[11] If the Authority determines not to construct or acquire, or to reduce the scope of, any such Additional Improvements or Additional Facilities, it may construct other improvements or facilities or broaden the scope of such improvements or facilities if the recognized experts certify that there will be no overall cost increase and that the changes will not impair the operating efficiency of the Project or materially adversely affect estimated Net Revenues. However, in the case of the improvements or facilities financed with Bonds issued pursuant to Paragraph E under "Issuance of Additional Bonds" above, construction or acquisition may be suspended or abandoned without compliance with the preceding sentence and any unexpended Bond proceeds will be transferred to another Project Account in the Construction Fund or to the Redemption Account. In any event, if the Authority determines that changes in financial, economic or other conditions since the issuance of any Additional Bonds make it imprudent to continue construction or acquisition of the Additional Improvements or Additional Facilities financed therewith, then construction or acquisition may be suspended or abandoned and any unexpended Bond proceeds may be transferred to another Project Account in the Construction Fund or the Redemption Account, as the Authority may determine.

No Liens (Section 704)

The Authority covenants not to create or suffer to be created any lien upon any Project or any of the Revenues except the lien created by the 1978 Trust Agreement and the liens described under "Issuance of Other Obligations" above. The Authority is required to pay or cause to be discharged all claims and demands which if unpaid might become such a lien, but is not required to provide for the payment and discharge of liens which are being contested in good faith and by appropriate legal proceedings.

Accountants, Consultants and Engineers (Section 706)

The 1978 Trust Agreement provides that the Authority (i) will, for the purpose of performing and carrying out the duties imposed on the Accountants by the 1978 Trust Agreement, employ a firm of independent certified public accountants of recognized ability and standing nationwide, (ii) will, for the purpose of performing and carrying out the duties imposed upon the Consulting Engineers, the Airport Consultants and the Traffic Engineers by the 1978 Trust Agreement, employ independent engineers or engineering firms having a nationwide and favorable repute for skill and experience in such work, and (iii) for the purpose of determining its

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[10] Option for "a Consultant" to be added upon effective date of the Twenty-First Supplemental Agreement.
[11] Option for "a Consultant" to be added upon effective date of the Twenty-First Supplemental Agreement.

annual pension expense and its annual post-retirement health benefit expense, may employ as Pension Consultants an independent actuarial consulting organization having a nationwide and favorable repute for skill and experience in such work. Other experts must be independent experts or firms of recognized ability and standing in their fields. The Consulting Engineers must prepare an annual report regarding maintenance of each Project and recommendations, including estimated costs, for maintenance and repair. Such reports are furnished to the Trustee and each Bondholder of Record. The Pension Consultants must submit annual reports setting forth the amount required to be transferred to the trustee for the Authority's pension plan in the next succeeding fiscal year.

Insurance (Sections 706 and 707)

The Authority covenants in the 1978 Trust Agreement that it will employ a Risk Management Consultant of recognized ability and standing nationwide to make recommendations with respect to insurance against direct physical damage and hazards, including the amounts thereof, with deductibles and exclusions and a program of self-insurance. The Risk Management Consultant will submit an annual report setting forth the insurance recommended to be carried or the program of self-insurance recommended to be undertaken. The Authority covenants that it will substantially comply with the recommendations of the Risk Management Consultant or with additional recommendations with respect to a reduced program of self-insurance if the Authority requests the Risk Management Consultant to make such additional recommendations. The Authority also covenants to carry insurance against loss of revenues due to physical loss or damage to its facilities and excess liability insurance substantially as recommended by the Risk Management Consultant. The 1978 Trust Agreement also provides that the Authority will provide such workers' compensation benefits or such employer's liability protection as may be required by law but may provide the same through self-insurance.

No Impairment of Tax Exemption (Section 709)

The Authority covenants that it will not take any action adversely affecting the federal income tax exemption of interest on the Bonds (except Bonds issued as taxable Bonds the interest on which is subject to federal income taxation) and will seek to preserve the exemption of interest on the Bonds from state income taxation. The Authority also will take or require to be taken such acts as may be reasonably within its ability and as may be required under applicable law to preserve the exemption from federal income taxation of interest on the Bonds (except any Bonds issued as taxable Bonds the interest on which is subject to federal income taxation).

Restrictions on Certain Additional Facilities (Section 710)

The Authority covenants that it will not construct, acquire, or operate any building, structure or other facility, other than facilities financed by Additional Bonds issued under Paragraphs A through D under "Issuance of Additional Bonds" above, unless the Consulting Engineers *or a Consultant* file a statement to the effect that in their opinion the operation of such facility will not materially adversely affect the Net Revenues or impair the operating efficiency of the Projects taken as a whole.[12]

Restrictions on Disposition of Property (Section 714)

The Authority covenants that it will not dispose of or encumber any Project or part thereof except that it may sell or otherwise dispose of machinery, fixtures and other movable property if they are no longer needed or useful and the proceeds are applied to replacement or are deposited in the appropriate Project Account in the Construction Fund or in the Maintenance Reserve Fund, the Improvement and Extension Fund or the Redemption Account, as the Authority may determine. Subject to the provisions of the Authority's Enabling Act, real estate which the Authority, with the approval of the Consulting Engineers *or a Consultant*, determines is no longer needed or useful may be sold or may be exchanged for real estate if the Authority and Consulting Engineers *or a Consultant* declare such exchange advantageous. No approval of the Consulting Engineers *or a Consultant* is required for the sale or exchange of real estate where the aggregate value of the real estate and contiguous parcels sold or exchanged within two years is no more than $500,000.[13]

Notwithstanding the preceding paragraph, the Authority may, if permitted by law, sell or exchange all or any part of a Project other than any property necessary for the efficient operation of the Airport, provided that certificates are filed with the Trustee showing compliance with the following requirements:

(A) no event of default is then existing under the 1978 Trust Agreement;

(B) the amount on deposit in *each subaccount within* the Reserve Account is at least equal to the *Reserve Requirement for* all Bonds then outstanding;[14] and

(C) pro forma estimates confirmed by recognized experts show that the average annual Net Revenues for the two preceding fiscal years after giving effect to such sale or exchange would be at least 140% of the maximum annual Principal and Interest Requirements in any fiscal year thereafter on all Bonds then outstanding.

The proceeds of any such sale are not Revenues. See definition of "Revenues" "(iv)" under "Certain Definitions" below. Such proceeds may be deposited in the Improvement and Extension Fund or the Redemption Account as the Authority may direct. The Authority may also lease and grant licenses to use all or parts of its Projects. The Enabling Act requires the approval of the Governor of the Commonwealth for the sale of any Airport Properties or Port Properties originally acquired from the Commonwealth and provides that any proceeds of such sale be paid to the Commonwealth.

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[12] Option for "Consultants" to be added upon effective date of the Twenty-First Supplemental Agreement.
[13] Option for "a Consultant" to be added upon effective date of the Twenty-First Supplemental Agreement.
[14] Language related to subaccounts and the Reserve Requirement to be added upon effective date of the Twenty-First Supplemental Agreement.

Annual Budget (Section 505)

Under the 1978 Trust Agreement, the Authority agrees to adopt an Annual Budget prior to each fiscal year, setting forth expected Operating Expenses and Revenues of the Authority and deposits in the various Funds and Accounts described above, and to furnish copies thereof to the Trustee, Consulting Engineer and each Bondholder of Record. The Authority may at any time adopt an amended Annual Budget for the remainder of the then current fiscal year which shall be treated as the Annual Budget. The Authority agrees that except for amounts payable from the Maintenance Reserve Fund it will not expend any amount or incur any obligations for maintenance, repair and operation in excess of the amounts provided for Operating Expenses in the Annual Budget, unless the excess is derived from a source other than Revenues. The Authority is also required to adopt a capital budget annually.

Investments in Funds and Accounts (Section 602)

Moneys held in the various Funds and Accounts, not currently needed for the purposes of such Funds and Accounts, will be invested by the Authority, or the Trustee upon direction of the Authority, in Investment Securities, except that moneys held in a Term Bond Investment Account may be invested only in Government Obligations. See "Certain Definitions -- Investment Securities" and "-- Government Obligations" below. Securities purchased as an investment of moneys in any Fund or Account created under the 1978 Trust Agreement shall be valued at their amortized cost. The income received from such investment shall, in the case of the Construction Fund and the Self-Insurance Account, be applied as provided in the resolution creating such Account.

Events of Default and Remedies of Bondholders (Article VIII)

The 1978 Trust Agreement defines events of default to include, among others, failure to pay principal or redemption price when due or any installment of interest within 30 days after due, failure to make a required deposit in a Term Bond Investment Account relating to Additional Bonds as will permit the purchase of Government Obligations in accordance with the resolution authorizing such Additional Bonds, failure to carry on with reasonable dispatch the construction of any Additional Improvements or Additional Facilities (except as described above under "Completion of Projects"), a determination of receivership or insolvency, and failure to perform the covenants contained in the 1978 Trust Agreement after notice. Certain grace periods, not exceeding 60 days in any case, are permitted for remedying certain defaults.

Upon the occurrence and continuance of an event of default the Trustee may, on its own initiative, and shall, upon the request of the holders of not less than 25% in principal amount of the Bonds then outstanding, declare the entire principal amount of all outstanding Bonds to be immediately due and payable. The Trustee may, and upon the request of not less than 25% in principal amount of all Bonds not then due by their terms shall, annul such declaration at any time before final judgment or decree in any suit instituted on account of the default or before completion of any other remedy, if all amounts then due on all outstanding Bonds by their terms and all other charges and liabilities of the Trustee and amounts payable by the Authority under the 1978 Trust Agreement have been paid or deposited with the Trustee and every other known default shall have been remedied.

Upon the happening and continuance of an event of default the Trustee may, on its own initiative, and shall, upon the request of the holders of not less than 25% in principal amount of the Bonds then outstanding and upon being indemnified to its satisfaction, proceed either at law or in equity to protect and enforce its rights and the rights of bondholders under the Enabling Act or the 1978 Trust Agreement. No holder of any Bonds shall have any right to institute any suit, action or other proceeding for the enforcement of any right under the 1978 Trust Agreement unless such holder shall give to the Trustee written notice of the event of default on account of which such suit, action or proceeding is to be instituted, and unless the holders of 25% in principal amount of the Bonds then outstanding shall have made written request of the Trustee and shall have afforded the Trustee a reasonable opportunity to institute such suit, action or proceeding and unless there shall have been offered to the Trustee reasonable security and indemnity against the costs, expenses and liabilities to be incurred, and the Trustee shall have refused or failed to comply with such request within a reasonable time. However, these provisions shall not limit or impair the right of any bondholder to take any action to enforce the payment of the principal of, premium, if any, and interest on its Bond.

The Trustee shall mail to all registered owners of Bonds then outstanding at their addresses as they appear on the registration books, and all other Bondholders of Record, written notice of the occurrence of any event of default set forth above within 30 days after the Trustee shall have notice pursuant to the 1978 Trust Agreement that any such event of default has occurred.

Concerning the Trustee (Article IX)

Under the 1978 Trust Agreement, the Trustee is not obliged to institute any suit or proceeding or to defend any suit until indemnified against liabilities and expenses. Under the 1978 Trust Agreement, the Trustee is indemnified by the Authority from Revenues for any liabilities incurred in acting under the 1978 Trust Agreement. The Trustee is entitled to reasonable compensation for acting under the 1978 Trust Agreement and to reimbursement for any litigation expenses and other reasonable expenses by the Authority. If the Authority fails to make payment pursuant to such provisions for indemnity by the Authority or payment of compensation or expenses, the Trustee may obtain such payment from moneys held under the 1978 Trust Agreement and is entitled to a preference therefor over any of the Bonds. The 1978 Trust Agreement provides that the Trustee and its directors, officers, employees or agents, either for its or their own accounts or fiduciary accounts, may buy and sell and hold Bonds.

The Trustee may at any time resign upon at least 60 days' written notice *to be given to the Authority and filed with EMMA*.[15] The Trustee may be removed at any time (a) by the holders of not less than a majority in principal amount of the outstanding Bonds, or (b) for breach of trust or failure to act in accordance with the 1978 Trust Agreement by a court upon application of the Authority or the holders of not less than 25% in principal amount of the outstanding Bonds. Any removal of the Trustee shall take effect upon the appointment of a new Trustee. If the position of Trustee shall become vacant for any reason, the Authority shall appoint a successor trustee, subject to the right of the holders of a majority in aggregate principal

[15] Notice by EMMA instead of publication to be added upon effective date of the Twenty-First Supplemental Agreement.

amount of the Bonds then outstanding to appoint a successor Trustee which shall supersede the appointee of the Authority. Any trustee must be a bank or trust company with at least $50,000,000 in aggregate capital and surplus.

The 1978 Trust Agreement also authorizes the Authority to replace the Trustee acting under the 1978 Trust Agreement, but only at five-year intervals and so long as no Event of Default exists under the 1978 Trust Agreement, upon 120 days written notice to the Trustee by filing with the Trustee an instrument signed on behalf of the Authority by its Secretary-Treasurer or other authorized officer.

Certain Rights of Bond Insurers (Section 1002)

With respect to any Series of Bonds or any maturity within a Series of Bonds all of the principal of and interest on which is insured by a bond insurance policy, if so provided in the resolution of the Authority authorizing the issuance of such Series, the terms "holder" and "owner" of Bonds and the term "bondholder", each as used in the 1978 Trust Agreement, for purposes of all consents, directions and notices provided for in the 1978 Trust Agreement shall mean, with respect to the Bonds of such Series or maturity, as the case may be, the issuer of such bond insurance policy as long as such policy issuer has not defaulted under such policy; provided, however, that unless it actually is the beneficial owner of the Bonds in respect of which a consent is requested, the policy issuer shall not have the power to act on behalf of the registered owners of any Bonds to consent to amendments, supplements or waivers that would (a) extend the stated maturity of or time for paying the interest on such Bonds, (b) reduce the principal amount of, purchase price for or redemption premium or rate of interest payable on such Bonds or (c) result in a privilege or priority of any Bond over any other Bond.

Modifications of the 1978 Trust Agreement (Article XI)

Under the terms of the 1978 Trust Agreement, the Authority and the Trustee, without consent of the holders of the Bonds, are authorized to enter into a supplemental agreement or agreements to cure any ambiguity or formal defect or omission or to correct any inconsistent provisions or obvious mistake in the 1978 Trust Agreement, to grant to the Trustee for the benefit of the holders of the Bonds any additional lawful rights to security, to add to the conditions, limitations and restrictions on the issuance of Bonds, to add to the covenants of the Authority, to provide for the issuance of subordinated obligations or to provide for the issuance of obligations under a supplemental agreement which are not payable from Revenues, or to modify the definition of Investment Securities in Section 101 as directed by the Authority. In addition, the 1978 Trust Agreement may be modified, altered, amended, added to or rescinded with the consent of the holders of not less than 51% in aggregate principal amount of the Bonds then outstanding or, if less than all Series of Bonds then outstanding are affected, the consent of the holders of not less than 51% in aggregate principal amount of each affected Series of Bonds. Notwithstanding the foregoing, without the consent of the holders of not less than 100% in aggregate principal amount of the Bonds then outstanding or, in case less than all of the several Series of Bonds then outstanding are affected thereby, the holders of not less than 100% in aggregate principal amount outstanding of each Series so affected, no such modification or amendment shall permit (a) an extension of the maturity of the principal of or the interest on any Bond issued thereunder, or (b) a reduction in the principal amount or redemption premium of any Bond or the rate of interest thereon, or (c) the creation of a lien upon or pledge of Revenues ranking prior to or on a parity with the lien or pledge created by the 1978 Trust Agreement, or (d) a preference or priority of any Bond or Bonds except as permitted by the 1978 Trust Agreement, or (e) a reduction in the aggregate principal amount of the Bonds required for consent to such modification or amendment

Defeasance (Article XII)

If the Authority shall pay or cause to be paid the principal, premium, if applicable, and interest to the holders of all outstanding Bonds, then the pledge of any Revenues and other moneys pledged under the 1978 Trust Agreement and all covenants, agreements and other obligations to the holders of Bonds shall terminate and be discharged and satisfied.

Bonds for the payment or redemption of which sufficient moneys, or sufficient Government Obligations the principal of and interest on which when due will provide moneys, to pay when due the principal, Amortization Requirements and interest on such Bonds have been irrevocably deposited with the Trustee for the sole purpose of paying or redeeming such Bonds will be deemed to have been paid within the meaning of the foregoing paragraph, provided that if any of such Bonds are to be redeemed prior to maturity, notice of such redemption must be duly given or irrevocable instructions to publish a notice to the bondholders, the form and content and substance of which are specified in the 1978 Trust Agreement, must have been given in form satisfactory to the Trustee.

Capital Appreciation Bonds (Section 1311)

Bonds of any Series may be issued with interest payable (i) only at their stated maturity date (or upon earlier redemption, purchase or acceleration) or (ii) in part at their stated maturity date (or upon earlier redemption, purchase or acceleration) and in part on stated interest payment dates, as set forth in the resolution authorizing the issuance of the Bonds.

Certain Definitions

Certain terms used in this Official Statement have the following meanings:

Additional Facilities -- Any revenue-producing facility which serves a public purpose and the acquisition or construction and the financing of which by the Authority may hereafter be authorized by the legislature of the Commonwealth, excluding, however, any extension, enlargement or improvement of a project then under the control of the Authority and any building, structure or other facility financed or refinanced by the Authority by obligations not issued under the provisions of the 1978 Trust Agreement.

Additional Improvements -- Any extension, enlargement or improvement of a Project, other than the extension, enlargement or improvement of any building, structure or other facility financed or refinanced by the Authority by obligations not issued under the provisions of the 1978 Trust Agreement.

Amortization Requirements -- The amounts for the respective fiscal years as determined by the Authority for the retirement of term Bonds of a Series.

Available Funds[16] -- *For any period of time, (i) the amount of PFC Revenues and/or CFCs to be received by the Authority during such period and not previously pledged or irrevocably committed to payment of principal of, interest on or premium, if any, on a Series of Bonds, and (ii) the amount of any other future income or revenue source not then included in the definition of "Revenues" that the Authority designates as "Available Funds" in a future resolution duly adopted by the Members of the Authority supplementing the 1978 Trust Agreement; provided, however, that any such resolution shall also establish a corresponding account and the functional provisions for the receipt, deposit and application of such source of income or revenue.*

Bondholder of Record -- The registered owner of outstanding fully registered Bonds or Bonds registered as to principal alone (in either case in an aggregate principal amount of at least $500,000) or any holder of outstanding Bonds who shall have filed with the Secretary-Treasurer of the Authority a request in writing setting forth his name and address and the particular reports, notices or other documents which he desires to receive and which are required to be mailed to bondholders of record under the provisions of the 1978 Trust Agreement. So long as the 2019 Bonds are in book-entry only form, the Bondholder of Record thereof for the purposes of the 1978 Trust Agreement shall be DTC or DTC's partnership nominee (or a successor securities depository). See "THE 2019 BONDS -- Book-Entry Only Method."

Bullet Maturities[17] -- *With respect to any Series of Bonds 25% or more of the principal of which matures on the same date or within a fiscal year, that portion of such Series which matures on such date or within such fiscal year; provided, however that the principal amount maturing on any date shall be reduced by the amount of such Bonds scheduled to be amortized by prepayment or redemption prior to their stated maturity date. Notes shall be deemed to be Bullet Maturities for purposes of the 1978 Trust Agreement.*

Consultant[18] -- *Any Independent consultant, consulting firm (including the Airport Consultants), engineer (including the Consulting Engineers), architect, engineering firm, architectural firm, accountant or accounting firm (including the Accountants), financial advisory or investment banking firm, or other expert recognized to be well-qualified for work of the character required and retained by the Authority to perform acts and carry out the duties provided for such consultant in the 1978 Trust Agreement.*

Customer Facility Charges or CFCs[19] -- *All amounts received by the Authority from the charges imposed by car rental companies upon car rental customers arriving at Boston Logan International Airport and renting a vehicle from a car rental company serving such Airport, which charges are established by the Authority by resolution.*

Designated Debt -- Any Series of Bonds, or portion thereof, with respect to which there shall be in effect a Qualified Hedge Facility.

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[16] Definition of "Available Funds" to be added upon effective date of the Twenty-First Supplemental Agreement.
[17] Definition of "Bullet Maturities" to be added upon effective date of the Twenty-First Supplemental Agreement.
[18] Definition of "Consultant" to be added upon effective date of the Twenty-First Supplemental Agreement.
[19] Definition of "Customer Facility Charges" or "CFCs" to be added upon effective date of the Twenty-First Supplemental Agreement.

EMMA[20]-- *The Electronic Municipal Market Access system operated by the Municipal Securities Rulemaking Board, or any successor thereto designated as a nationally recognized municipal securities information repository by the United States Securities and Exchange Commission.*

Government Obligations -- The securities referred to in the first clause of the definition of Investment Securities. See below.

Independent[21] -- *When used with respect to any specified firm or individual, such a firm or individual that (a) does not have any direct financial interest or any material indirect financial interest in the operations of the Authority, other than the payment to be received under a contract for services to be performed, and (b) is not connected with the Authority as an official, officer or employee.*

Investment Securities -- Any of the following which at the time of investment are legal investments under the laws of the Commonwealth for the moneys proposed to be invested therein:

Direct obligations of, or obligations the principal of and interest on which are unconditionally guaranteed by, the United States of America;

Bonds, indentures or notes or other evidences of indebtedness issued or guaranteed by any of the following agencies: Bank for Cooperatives; Federal Intermediate Credit Banks; Federal Home Loan Mortgage Corporation; Federal Home Loan Banks; the Federal National Mortgage Association; the United States Postal Service; the Government National Mortgage Association; the Federal Financing Bank; or any other agency or instrumentality of the United States of America now existing or hereafter created;

New Housing Authority Bonds or project notes issued by public agencies or municipalities and fully secured as to the payment of both principal and interest by, respectively, a pledge of annual contributions under an annual contributions contract or contracts or requisition or payment agreements with the United States of America;

Negotiable or non-negotiable bank time deposits evidenced by certificates of deposit issued by banks, trust companies, national banking associations or savings and loan associations (which may include the Trustee) provided that such time deposits are fully insured by the Federal Deposit Insurance Corporation or secured by obligations described in clauses (i), (ii) or (iii) of this definition or by full faith and credit obligations of (a) the Commonwealth or (b) any state of the United States rated in the three highest grades by a nationally recognized rating agency, provided such obligations at all times have a market value at least equal to the maturity value of the deposits so secured, including accrued interest on such deposits;

[20] Definition of "EMMA" to be added upon the effective date of the Twenty-First Supplemental Agreement.
[21] Definition of "Independent" to be added upon effective date of the Twenty-First Supplemental Agreement.

Repurchase agreements with banks described in clause (iv) of this definition (which may include the Trustee) or government bond dealers reporting to, trading with, and recognized as primary dealers by, a Federal Reserve Bank, the underlying securities of which are obligations described in clauses (i) and (ii) of this definition, provided that the underlying securities are required to be continuously maintained at a market value not less than the amount so invested;

Any bonds or other obligations of any state of the United States of America or of any local government unit of any such state which (1) are rated in the highest rating category by Moody's Investors Service and Standard & Poor's, without regard to gradations within categories, (2) are not callable unless irrevocable instructions have been given to the trustee for such bonds to give due notice of redemption and to call such bonds for redemption on the date(s) specified in such instruments, and (3) are secured by cash and Government Obligations;

Direct and general obligations of any state of the United States of America, to the payment of the principal of and interest on which the full faith and credit of such state is pledged, provided such obligations are rated in either of the two highest rating categories without regard to gradations within categories by Moody's Investors Service and Standard & Poor's;

Obligations of any state of the United States of America or any political subdivision thereof which shall be rated in one of the two highest rating categories by Moody's Investors Service and Standard & Poor's without regard to gradations within categories;

Certificates that evidence ownership of the right to payments of principal of or interest on Government Obligations, provided that (1) such obligations shall be held in trust by a bank or trust company or a national banking association meeting the requirements for a successor Trustee under the 1978 Trust Agreement, (2) the owner of the investment is the real party in interest and has the right to proceed directly and individually against the obligor of the underlying Government Obligations, and (3) the underlying Government Obligations are held in a special account separate from the custodian's general assets, and are not available to satisfy any claim of the custodian, any person claiming through the custodian, or any person to whom the custodian may be obligated;

Commercial paper rated at the time of purchase in the highest rating category, without regard to gradations within such category, by Moody's Investors Service and Standard & Poor's;

Investments or deposits in the Massachusetts Municipal Depository Trust;

Money market funds rated in the highest rating category, without regard to gradations within such category, by Moody's Investors Service and Standard & Poor's;

Investment contracts with banks (which may include the Trustee) or other financial institutions whose long-term unsecured debt or claims-paying ability is rated in one of the two highest rating categories by Moody's Investors Service and Standard & Poor's;

Banker's acceptances rated at the time of purchase in the highest short-term rating category, without regard to gradations within such category, of Moody's Investors Service and Standard & Poor's;

Advance-refunded municipal bonds rated in the highest rating category, without regard to gradations within such category, by Moody's Investors Service and Standard & Poor's;

U.S. dollar denominated debt offerings of a multilateral organization of governments rated in the highest rating category, without regard to gradations within such category, by Moody's and S&P;

U.S. dollar denominated corporate bonds, notes or other debt obligations issued or guaranteed by a domestic or foreign corporation, financial institution, non-profit or other entity rated in one of the three highest rating categories, without regard to gradations within such categories, by Moody's Investors Service and S&P;

Negotiable bank certificates of deposit, deposit notes or other deposit obligations issued by a nationally or state chartered bank, credit union or savings association, or by a federally or state-licensed branch of a foreign bank or financial institution, in each case rated in one of the three highest rating categories, without regard to gradations within such categories, by Moody's or S&P; and

Any other investment authorized pursuant to an amendment or supplement to the 1978 Trust Agreement pursuant to Section 1101(g) of the 1978 Trust Agreement.

Section 1101(g) of the 1978 Trust Agreement authorizes modification of the definition of Investment Securities as directed by the Authority, provided that the Authority shall have provided evidence to the Trustee that the details of such modification have been provided in writing to each of Moody's Investors Service (if Moody's Investors Service is then assigning a rating to any outstanding Bonds), Standard & Poor's (if Standard & Poor's is then assigning a rating to any outstanding Bonds) and each other nationally recognized rating agency, if any, then assigning a rating to any outstanding Bonds and that each such rating agency has either (i) confirmed in writing that such modification will not adversely affect the rating it assigns to outstanding Bonds or (ii) issued a rating on a Series of Bonds to be issued which is not lower than the rating assigned by such rating agency to outstanding Bonds prior to such modification, or any other evidence satisfactory to the Trustee that such modification will not adversely affect the then current ratings, if any, assigned to the Bonds by any nationally recognized rating agency.

Operating Expenses -- The Authority's reasonable and necessary current expenses of maintaining, repairing and operating the Projects, including administrative expenses, insurance premiums and payments into the Self-Insurance Account, fees and expenses of the Trustee, engineering expenses relating to operation and maintenance, legal expenses, charges of Paying Agents, payments of annual pension expense and post-retirement health benefits expense, any taxes of general applicability which may be lawfully imposed on the Authority or its income or operations or the property under its control and reserves for such taxes, ordinary and usual expenditures for maintenance and repair, which may include expenses not annually recurring, including such expenditures necessary to maintain the then useful life and operational status of any Project or to keep any Project in its present operational status and all such other costs of maintenance and repair as the Authority may determine to include in Operating Expenses in accordance with sound business practice applied on a consistent basis and any other expenses required to be paid by the Authority under the provisions of the 1978 Trust Agreement or by law on account of the operation or ownership of the Projects, but excluding costs payable from the Maintenance Reserve Fund and reserves for operation, maintenance or repair, depreciation allowances or any deposits or transfers to the credit of any of the Funds or Accounts created under the 1978 Trust Agreement except the Self-Insurance Account, pension account and post-retirement health benefits account.

Passenger Facility Charges or *PFCs*[22] -- *The passenger facility charges authorized to be charged by the Authority pursuant to the Aviation Safety and Capacity Expansion Act of 1990, as amended (now codified in Section 40117 of Title 49 of the United States Code)*.

PFC Revenues[23] -- *Amounts derived by the Authority from the imposition of PFCs, exclusive of the amounts retained by the air carriers collecting the PFCs pursuant to Federal Aviation Regulations.*

Pooled Reserve Subaccount[24] -- *The subaccount within the Reserve Account securing all Bonds outstanding prior to the effective date of the Twenty-First Supplemental Agreement and, on and after such effective date, securing those Bonds designated as secured by the Pooled Reserve Subaccount pursuant to a resolution adopted by the Authority*.

Principal and Interest Requirements -- With respect to any Series of Bonds, the sum during any fiscal year of (a) interest payable on all Bonds of such Series outstanding which accrues in such fiscal year (less capitalized interest and interest paid or to be paid for such period from moneys in the Construction Fund), (b) principal payable on serial Bonds of such Series on any date commencing with July 2 in such fiscal year and ending with July 1 of the next fiscal year, both inclusive, (c) the Amortization Requirements of term Bonds of such Series, if any, for such fiscal year, plus an amount equal to the premium, if any, which would be payable on any date referred to in subparagraph (b) of this definition on a like principal amount of Bonds if such principal amount of Bonds should be redeemed on such date from moneys in the Interest and Sinking Fund, and (d) the amount required to be deposited in the Term Bond Investment Account (if such an Account is established for such Series of Bonds), if any, for such fiscal year; less income to be accrued during the year on investments in such a Term Bond Investment Account to the extent such income is required to be retained in such Account or deposited in the Bond Service Account or into the Redemption Account.

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[22] Definition of "Passenger Facility Charges" or "PFCs" to be added upon effective date of the Twenty-First Supplemental Agreement.

[23] Definition of "PFC Revenues" to be added upon effective date of the Twenty-First Supplemental Agreement.

[24] Definition of "Pooled Reserve Subaccount" to be added upon effective date of the Twenty-First Supplemental Agreement.

Regarding the calculation of Principal and Interest Requirements on variable-rate debt, see "SECURITY FOR THE 2019 BONDS -- Additional Bonds". In computing the Principal and Interest Requirements, Designated Debt which bears interest at a variable rate and with respect to which there exists a Qualified Hedge Facility obligating the Authority to pay a fixed interest rate or a different variable interest rate shall be deemed (for the period during which such Qualified Hedge Facility is reasonably expected to remain in effect) to bear interest at the fixed interest rate or different variable rate payable by the Authority pursuant to the Qualified Hedge Facility relating thereto. In computing Principal and Interest Requirements, Designated Debt which bears interest at a fixed rate and with respect to which there exists a Qualified Hedge Facility obligating the Authority to pay a floating rate shall be deemed (for the period during which such Qualified Hedge Facility is reasonably expected to remain in effect) to bear interest equal to the interest payable on the Designated Debt, minus the fixed amounts received or to be received by the Authority under the Qualified Hedge Facility, plus the amount of the floating payments made or to be made by the Authority under the Qualified Hedge Facility (such floating payments not yet made to be determined as provided for variable rate Bonds).

<u>*In computing the Principal and Interest Requirements, if all or any portion or portions of any outstanding Series of Bonds constitute Bullet Maturities, then each maturity which constitutes Bullet Maturities shall, unless a shorter term was otherwise provided in the resolution of the Authority pursuant to which such Bullet Maturities were issued or unless the next succeeding paragraph then applies to such maturity, be treated as if it were to be amortized over a term of not more than thirty (30) years and with substantially level annual debt service funding payments commencing not later than the year following the year in which such Bullet Maturities were issued, and extending not later than thirty (30) years from the date such Bullet Maturities were originally issued. The interest rate used for such computation shall be that rate determined by a Consultant selected by the Authority to be a reasonable market rate for fixed-rate Bonds of a corresponding term and tenor issued under the 1978 Trust Agreement on the date of such calculation, with no credit enhancement. With respect to any Series of Bonds only a portion of which constitutes Bullet Maturities, the remaining portion shall be treated as described in such other provision of this definition as shall be applicable and, with respect to any such Series of Bonds, or that portion of a Series thereof which constitutes Bullet Maturities, all funding requirements of principal and interest becoming due prior to the year of the stated maturity of the Bullet Maturities shall be treated as described in such other provision of this definition as shall be applicable*</u>.

<u>*In computing the Principal and Interest Requirements, if any maturity of Bonds which constitutes Bullet Maturities as described in the immediately preceding paragraph of this definition and for which the stated maturity date occurs within twelve (12) months from the date such calculation of Principal and Interest Requirements is made, such maturity shall be assumed to become due and payable on the stated maturity date and the immediately preceding paragraph shall not apply thereto unless there is delivered to an officer of the Authority or Consultant making the calculation of Principal and Interest Requirements a certificate of an authorized officer of the Authority stating that the Authority intends to refinance such maturity and stating the probable terms of such refinancing and that the debt capacity of the Authority is sufficient to successfully complete such refinancing; and upon the receipt of such certificate, such Bullet Maturities shall be assumed to be refinanced in accordance with the probable terms set out in such certificate and such terms shall be used for purposes of calculating Principal and*</u>

Interest Requirements, provided that such assumption shall not result in an interest rate lower than that which would be assumed under the immediately preceding paragraph and shall be amortized over a term of not more than thirty (30) years from the date of refinancing.

If Available Funds (including state and/or federal grants) have been irrevocably committed or are held by the Trustee or another fiduciary and are to be set aside exclusively to be used to pay principal of, interest or premium, if any, on specified Bonds pursuant to a resolution of the Authority (and are not otherwise required for payment of another Series of Bonds), then the principal, interest and/or premium to be paid from such Available Funds or from earnings thereon shall be disregarded and not included in calculating Principal and Interest Requirements.[25]

Project -- Any of the Bridge Properties, Airport Properties, the Port Properties or any Additional Facility financed in whole or in part under the provisions of the 1978 Trust Agreement, either from the proceeds of Bonds or other available funds, including in the case of each such Project all equipment, appurtenances, extensions, enlargements, improvements, renewals and replacements thereof, but shall not include any land, building, structure or other facility financed or refinanced by the Authority by obligations not issued under the provisions of the 1978 Trust Agreement.

Qualified Hedge Facility -- Any interest rate exchange, interest rate cap or other transaction which is intended to convert or limit the interest rate payable with respect to all or part of a particular Series of Bonds and which (a) is with a Qualified Hedge Provider and (b) has been designated in writing to the Trustee by the Authority as a Qualified Hedge Facility with respect to all or part of a particular Series of Bonds;

Qualified Hedge Provider -- A financial institution (a) whose senior long-term obligations are rated not lower than “A1” or the equivalent by Moody’s Investors Service and not lower than “A+” or the equivalent by Standard & Poor’s or (b) whose obligations under each Qualified Hedge Facility (i) are guaranteed by a financial institution, or subsidiary of a financial institution, whose senior long-term debt obligations are rated not lower than “A1” or its equivalent by Moody’s Investors Service and not lower than “A+” or its equivalent by Standard & Poor’s or (ii) are fully secured by investments described in clause (i) or (ii) of the definition of “Investment Securities” which (A) are valued not less frequently than monthly and have a fair market value, exclusive of accrued interest, at all times at least equal to 100% of the Authority’s exposure in respect of such Qualified Hedge Facility, (B) are held by the Trustee or a custodian other than the Qualified Hedge Provider and (C) are subject to a perfected lien in favor of the Authority or the Trustee free and clear of all third-party liens.

Replacement Cost -- As of any date of calculation the then present-day cost to replace or reconstruct all or any of the physical facilities of the Authority to their current use or operational status with materials then used in accordance with sound construction practice but shall exclude (a) the cost to reconstruct or replace all below-ground or below-water foundations and utility improvements and the cost of land, landfill and site improvements and (b) if and to the extent

[25] Amendment to the definition of “Principal and Interest Requirements” to be effective upon effective date of the Twenty-First Supplemental Agreement.

that the Authority shall have so notified the Trustee in writing, the cost to reconstruct or replace any facility financed with the proceeds of obligations other than Bonds, which obligations are not secured by any pledge, lien or charge on, nor payable from, the Revenues or any of the Funds and Accounts created by the 1978 Trust Agreement.

Reserve Requirement[26] -- *(a) With respect to the Pooled Reserve Subaccount, the maximum annual Principal and Interest Requirements on all of the outstanding Bonds secured by the Pooled Reserve Subaccount, and (b) with respect to each Series of Bonds issued on and after the effective date of the Twenty-First Supplemental Agreement and not secured by the Pooled Reserve Subaccount, as of any date of calculation for a particular subaccount within the Reserve Account other than the Pooled Reserve Subaccount, the amount of money, if any, required by the resolution adopted by the Authority authorizing the issuance of such Series of Bonds to be maintained in a subaccount in the Reserve Account with respect to such Series of Bonds, which amount shall be available for use only with respect to such Series of Bonds. Any Series of Bonds may be secured by the Pooled Reserve Subaccount, or another specified subaccount within the Reserve Account pursuant to the resolution authorizing such Bonds, if the resolution adopted by the Authority that initially established such account provided for securing more than one Series of Bonds with such subaccount, or the Authority may elect not to establish a subaccount within the Reserve Account to secure such Series of Bonds*.

Revenues -- All moneys derived or to be derived by the Authority in payment of tolls, rates, fees, rentals and other charges for the use of, and for the services and facilities furnished by, the Projects, any proceeds of use and occupancy and liability insurance (but not casualty insurance proceeds or awards for damages), the proceeds of leases, licenses, permits and concessions, and other income from the ownership or operation of the Projects, including income from investments except those in the Construction Fund, the Self-Insurance Account, any pension or post-retirement health benefit account in the Operating Fund and the Term Bond Investment Account; but excluding (i) moneys derived from facilities financed with the proceeds of obligations not secured by or payable from Revenues to the extent such moneys are pledged to the payment of such obligations, (ii) proceeds of casualty insurance or awards for damages, (iii) proceeds of sales of Bonds, (iv) proceeds of the sale or other disposition of property pursuant to the 1978 Trust Agreement and (v) except to the extent from time to time provided by the Authority by resolution, the proceeds of any passenger facility charge or similar tax levied by or on behalf of the Authority pursuant to the Federal Aviation Safety and Capacity Act of 1990 as from time to time amended, and any successor thereto, and the proceeds of any other charge or tax from time to time levied by or on behalf of the Authority pursuant to any federal statute or regulation enacted or promulgated after May 15, 2003 which restricts the use of such proceeds to purposes identified in or pursuant to such statute or regulation. The Authority has excluded from Revenues the proceeds of PFCs and CFCs. *Notwithstanding the foregoing to the contrary, Revenues shall also include Available Funds in the amount, for the period and subject to such conditions as may be provided by a resolution of the Authority*.[27] See "SECURITY FOR THE 2019 BONDS – Use of Available Funds to Pay Debt Service" and "-- Other Revenues of the

[26] Definition of "Reserve Requirement" to be added upon effective date of the Twenty-First Supplemental Agreement.
[27] Amendment to the definition of "Revenues" to be effective upon effective date of the Twenty-First Supplemental Agreement.

Authority Not Pledged as Security for the Bonds – *Passenger Facility Charges*" and "—*Customer Facility Charges*."

Term Bond Investment Account -- For a Series of Bonds shall mean each Account so designated which is established in the Interest and Sinking Fund for the term Bonds of such Series pursuant to the resolution of the Authority authorizing the issuance of such Series of Bonds. (No such Account will be established for any of the 2019 Bonds.)

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APPENDIX F

AUTHORITY REQUEST FOR WRITTEN CONSENT TO PROPOSED AMENDMENTS

MASSACHUSETTS PORT AUTHORITY

$________ Revenue Bonds, Series 2019-B (Non-AMT) and
$________ Revenue Bonds, Series 2019-C (AMT)

Anticipated Sale Date: July 10, 2019
Anticipated Delivery Date: July 17, 2019

To: Prospective purchasers of the above bonds (the "***Series 2019 Bonds***")

The Massachusetts Port Authority (the "***Authority***") understands that you have indicated your intention to purchase Series 2019 Bonds of certain maturities and amounts. In that regard, the Authority is hereby advising you that the sale of the Series 2019 Bonds by the Authority to the underwriters named in the Preliminary Official Statement prepared by the Authority in connection with the offering of the Series 2019 Bonds (the "***POS***") and the subsequent sale of the Series 2019 Bonds by such underwriters to you is conditioned upon receipt of your written consent to the proposed amendments to the 1978 Trust Agreement (as defined in the POS) described in the POS (the "***Consent Amendments***"). The text of the Consent Amendments is available from the Authority or the Trustee. A general description of the Consent Amendments is provided in the POS under the caption "SECURITY FOR THE 2019 BONDS-Modifications of the 1978 Trust Agreement".

In order to become effective, the Consent Amendments require, among other things, the written consent of the Holders of not less than 51% of the Bonds outstanding under the 1978 Trust Agreement. Accordingly, the Authority is requesting that you evidence your consent to the Consent Amendments by executing the acknowledgement set forth below. The underwriters have not been requested to provide, nor will they provide, consent to the Consent Amendments on behalf of any Series 2019 Bond purchaser. The Authority currently anticipates the Consent Amendments becoming effective upon the date of issuance of the Series 2019 Bonds; however, such effective date may be later than such date, or may never occur.

By signing in the space provided below:

(1) you acknowledge you have read and understand the foregoing;

(2) you hereby provide your express and irrevocable written consent to the Consent Amendments and you approve execution and delivery of the Twenty-first Supplemental Agreement as provided in the POS, such consent and approval to be effective immediately upon, and simultaneously with, the delivery of the Series 2019 Bonds to your custodial account with your DTC Participant;

(3) you hereby waive any publication and mailing of notice of the Consent Amendments pursuant to the provisions of the 1978 Trust Agreement;

(4) you irrevocably waive any right under the 1978 Trust Agreement to any publication that the Consent Amendments have received the necessary Bondholder consent; and

(5) you agree that you are the purchaser or beneficial holder of the principal amount of the Series 2019 Bonds identified below or you are authorized to execute and deliver this consent on behalf of the purchaser of such Bonds and that a facsimile signature and signature page provided in the form of a "pdf" or similar imaged document transmitted by electronic mail or facsimile shall be deemed an original signature for all purposes.

If you are in agreement with the foregoing, please so indicate by signing and dating in the spaces provided below, having this Consent witnessed and returning this letter to Andrew Liou at Citigroup Global Markets Inc. via Email at Andrew.liou@citi.com. For questions, please call Mr. Liou at (212) 723-2252.

Very truly yours,

MASSACHUSETTS PORT AUTHORITY

ACKNOWLEDGED AND AGREED:

Print name of Purchaser or Managing Firm (having authority to consent on behalf of the Purchaser):

____

Custodian/DTC Participant Name: ______________________________________

DTC Participant No.: _______________________

Name(s) of funds which the Managing Firm is authorized to provide consent for:

____

Purchaser or Authorized Employee of Managing Firm:

____ (Print Name)

____ (Sign Name)

Date: ____________, 2019

WITNESS AFFIDAVIT

I, _____________ (name of witness), the ______________ (title) of __________________ (firm) hereby certify that I have witnessed the execution of this Consent and that the person signing this Consent is known to me and has the authority to provide the foregoing Consent.

By: _________________________________

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FORM OF CONTINUING DISCLOSURE CERTIFICATE

This Continuing Disclosure Certificate (the "Disclosure Certificate") is executed and delivered by the Massachusetts Port Authority (the "Issuer") in connection with the issuance of one or more series of bonds by or on behalf of the Issuer and designated by duly adopted resolution of the Issuer as subject to and having the benefits of this Disclosure Certificate (such bonds referred to herein collectively as the "Bonds"). The Issuer covenants and agrees as follows:

SECTION 1. Purpose of the Disclosure Certificate. This Disclosure Certificate is being executed and delivered by the Issuer for the benefit of the owners of Bonds and in order to assist Participating Underwriters in complying with the Rule (as defined below).

SECTION 2. Definitions. In addition to terms defined elsewhere in this Disclosure Certificate, the following capitalized terms shall have the following meanings:

"Annual Filing" shall mean any Annual Filing provided by the Issuer pursuant to, and as described in, Sections 3 and 4 of this Disclosure Certificate.

"Dissemination Agent" shall mean Digital Assurance Certification, L.L.C., acting in its capacity as dissemination agent for the Issuer pursuant to the Disclosure Dissemination Agent Agreement dated as of January 8, 2010, between the Issuer and Digital Assurance Certification, L.L.C., or any successor thereto designated in writing by the Issuer as its agent for purposes of satisfying the filing and notice requirements assumed by the Issuer under this Disclosure Certificate, and which successor has filed with the Issuer a written acceptance of such designation.

"Listed Events" shall mean any of the events listed in Section 5(a) of this Disclosure Certificate.

"MSRB" means the Municipal Securities Rulemaking Board established pursuant to Section 15B(b)(1) of the Securities Exchange Act of 1934, or any successor thereto or to the functions of the MSRB contemplated by this Disclosure Certificate. Until otherwise designated by the MSRB or the Securities and Exchange Commission, filings with the MSRB are to be made through the Electronic Municipal Market Access (EMMA) website of the MSRB, currently located at http://emma.msrb.org.

"Owners of the Bonds" or "Owners" shall mean the registered owners, including beneficial owners, of the Bonds.

"Participating Underwriters" shall mean the original underwriters of any Bonds required to comply with the Rule in connection with the offering of such Bonds.

"Rule" shall mean Rule 15c2-12 adopted by the Securities and Exchange Commission under the Securities Exchange Act of 1934, as the same may be amended from time to time.

"Trust Agreement" shall mean the Trust Agreement dated as of August 1, 1978, as amended and supplemented, between the Issuer and State Street Bank and Trust Company, as Trustee.

SECTION 3. Provision of Annual Filings.

(a) The Issuer shall, or shall cause the Dissemination Agent to, not later than January 1 of each year, commencing January 1, 2020, provide to the MSRB an Annual Filing that is consistent with the requirements of Section 4 of this Disclosure Certificate. The Annual Filing may be submitted as a single document or as separate documents comprising a package, and may cross-reference other information as provided in Section 4 of this Disclosure Certificate; provided that the audited financial statements of the Issuer may be submitted, when available, separately from the balance of the Annual Filing.

(b) If the Issuer is unable to provide the Annual Filing to the MSRB by the date required in subsection (a), the Issuer shall send, or cause the Dissemination Agent to send, a notice in a timely manner to the MSRB in substantially the form attached as Exhibit A.

SECTION 4. Content of Annual Filings. The Issuer's Annual Filing shall contain or incorporate by reference the following:

(a) operating data for, or as of the end of, the preceding fiscal year of the type presented in the Issuer's most recent official statement, including data relating to (i) the market shares of total Airport passenger traffic, (ii) the percentage of passengers traveling on U.S. air carrier airlines between the Airport and other final domestic destinations, (iii) general Airport traffic statistics and (iv) cargo and passenger activity relating to the Port Properties;

(b) financial information for, or as of the end of, the preceding fiscal year of the type presented in the Issuer's most recent official statement, including a summary of operating results and debt service coverage; and

(c) the most recently available audited financial statements of the Issuer, prepared in accordance with generally accepted accounting principles. (If audited financial statements for the preceding fiscal year are not available when the Annual Filing is submitted, the Annual Filing will include unaudited financial statements for the preceding fiscal year.)

Any or all of the items listed above may be incorporated by reference from other documents, including official statements of debt issues of the Issuer or related public entities, which (i) are available to the public on the MSRB's Internet Web site or (ii) have been filed with the Securities and Exchange Commission. The Issuer shall clearly identify each such other document so incorporated by reference.

SECTION 5. Reporting of Significant Events.

(a) The Issuer shall give notice, or shall cause the Dissemination Agent to give notice, in accordance with subsection 5(b) below, of the occurrence of any of the following events with respect to any Bonds:

(i) Principal and interest payment delinquencies.

(ii) Non-payment related defaults, if material.

(iii) Unscheduled draws on debt service reserves reflecting financial difficulties.

(iv) Unscheduled draws on credit enhancements reflecting financial difficulties.

(v) Substitution of credit or liquidity providers, or their failure to perform.

(vi) adverse tax opinions, the issuance by the Internal Revenue Service of proposed or final determination of taxability, Notices of Proposed Issue (IRS Form 5701-TEB) or other material notices or determinations with respect to the tax status of the Bonds, or other material events affecting the tax status of the Bonds.

(vii) Modifications to rights of any Owners of the Bonds, if material.

(viii) Optional, contingent or unscheduled calls of Bonds, if material, and tender offers.

(ix) Defeasance of any Bonds or any portion thereof.

(x) Release, substitution or sale of property securing repayment of any Bonds, if material.

(xi) Rating changes.

(xii) Bankruptcy, insolvency, receivership or similar event of the Issuer.*

(xiii) The consummation of a merger, consolidation, or acquisition involving the Issuer or the sale of all or substantially all of the assets of the Issuer, other than in the ordinary course of business, the entry into a definitive agreement to undertake such an action or the termination of a definitive agreement relating to any such actions, other than pursuant to its terms, if material.

(xiv) Appointment of a successor or additional trustee or the change of name of the Trustee, if material.

(xv) Incurrence of a financial obligation of the Issuer, if material, or agreement to covenants, events of default, remedies, priority rights, or other similar terms of a financial obligation of the Issuer, any of which affect Owners of the Bonds, if material.**

(xvi) Default, event of acceleration, termination event, modification of terms, or other similar events under the terms of a financial obligation of the Issuer, any of which reflect financial difficulties.**

(b) Upon the occurrence of a Listed Event, the Issuer shall, in a timely manner not in excess of ten (10) business days after the occurrence of the event, file, or cause the Dissemination Agent to file, a notice of such occurrence with the MSRB.

(c) Anything in this Section 5 to the contrary notwithstanding, the Issuer shall have no obligation to give notice of or otherwise report any Listed Event with respect to any series of Bonds as to which another obligated person (as such term is defined in the Rule) has entered into an undertaking to provide such notice in accordance with the Rule.

SECTION 6. Transmission of Information and Notices. Unless otherwise required by law, all notices, documents and information provided to the MSRB shall be provided in electronic format as prescribed by the MSRB and shall be accompanied by identifying information as prescribed by the MSRB.

SECTION 7. Termination of Reporting Obligation. The Issuer's obligations under this Disclosure Certificate shall terminate upon the defeasance, prior redemption or payment in full of all of the Bonds.

SECTION 8. Amendment; Waiver. Notwithstanding any other provision of this Disclosure Certificate, the Issuer may amend this Disclosure Certificate and any provision of this Disclosure Certificate may be waived, if such amendment or waiver is permitted by the Rule, as evidenced by an opinion of counsel expert in federal securities laws to the effect that such amendment or waiver would not, in and of itself, cause the undertakings herein to violate the Rule if such amendment or waiver had been effective on the date hereof but taking into account any subsequent change in or official interpretation of the Rule.

If the amendment provides for a change in the accounting principles to be followed in preparing financial statements, the Annual Filing for the year in which the change is made shall present a comparison between the financial statements or information prepared on the basis of the new accounting principles and those prepared on the basis of the former accounting principles. The comparison shall include a qualitative discussion of the differences in the accounting

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* As noted in the Rule, this event is considered to occur when any of the following occur: (i) the appointment of a receiver, fiscal agent or similar officer for the Issuer in a proceeding under the U.S. Bankruptcy Code or in any proceeding under state or federal law in which a court or governmental authority has assumed jurisdiction over substantially all of the assets or business of the Issuer, or if such jurisdiction has been assumed by leaving the existing governing body and officials or officers in possession but subject to the supervision and orders of a court or governmental authority, or (ii) the entry of an order confirming a plan of reorganization, arrangement or liquidation by a court or governmental authority having supervision or jurisdiction over substantially all of the assets or business of the Issuer.

** For purposes of event numbers (xv) and (xvi) in Section 5(a) of this Disclosure Certificate, the term "financial obligation" means a (i) debt obligation; (ii) derivative instrument entered into in connection with, or pledged as security or a source of payment for, an existing or planned debt obligation; or (iii) guarantee of (i) or (ii). The term "financial obligation" excludes municipal securities for which a final official statement has been provided to the MSRB consistent with the Rule.

principles and the impact of the change in the accounting principles on the presentation of the financial information in order to provide information to investors to enable them to evaluate the ability of the Issuer to meet its obligations. To the extent reasonably feasible, the comparison shall also be quantitative. A notice of the change in the accounting principles shall be sent to the MSRB.

SECTION 9. Default. In the event of a failure of the Issuer to comply with any provision of this Disclosure Certificate, any Owner of any Bonds may seek a court order for specific performance by the Issuer of its obligations under this Disclosure Certificate. A default under this Disclosure Certificate shall not be deemed an event of default under the Trust Agreement, and the sole remedy under this Disclosure Certificate in the event of any failure of the Issuer to comply with this Disclosure Certificate shall be an action to compel performance of the Issuer's obligations hereunder and not for money damages in any amount.

SECTION 10. Beneficiaries. This Disclosure Certificate shall inure solely to the benefit of the Issuer, Participating Underwriters and Owners from time to time of the Bonds, and shall create no rights in any other person or entity.

SECTION 11. Governing Law. This instrument shall be governed by the laws of The Commonwealth of Massachusetts.

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IN WITNESS WHEREOF, the Issuer has caused this Disclosure Certificate to be duly executed under seal as of the date hereof.

Date: July __, 2019

MASSACHUSETTS PORT AUTHORITY

By_________________________________
Title: Acting Director of Administration & Finance/
Secretary-Treasurer

APPENDIX G

EXHIBIT A

NOTICE OF FAILURE TO FILE ANNUAL FILING

Name of Issuer: Massachusetts Port Authority

NOTICE IS HEREBY GIVEN that the Issuer has not provided an Annual Filing as required by the Continuing Disclosure Certificate of the Issuer dated as of July __, 2019. The Issuer anticipates that the Annual Filing will be filed by ___________________.

Dated: ________________

[DISSEMINATION AGENT],
on behalf of the Issuer

By_________________________________

cc: Massachusetts Port Authority

**[FORM OF OPINION OF
FOLEY & LARDNER LLP (CO-BOND COUNSEL)]**

July [ ], 2019

Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston, Massachusetts 02128-2909

Re: Massachusetts Port Authority $[___________] Revenue Bonds, Series 2019-B (Non-AMT) and $[___________] Revenue Bonds, Series 2019-C (AMT)

Ladies and Gentlemen:

We have acted as bond counsel with Kaplan Kirsch & Rockwell LLP to the Massachusetts Port Authority (the "***Authority***") in connection with the issuance by the Authority of its $[____________] Revenue Bonds, Series 2019-B (Non-AMT) (the "***2019-B Bonds***") and its $[____________] Revenue Bonds, Series 2019-C (AMT) (the "***2019-C Bonds***") (the "***2019-B Bonds*** and the "***2019-C Bonds***", collectively referred to as the "***2019 Bonds***"). The 2019 Bonds are issued pursuant to Chapter 465 of the Massachusetts Acts of 1956, as amended to the date hereof (as so amended, the "***Act***"), the Trust Agreement dated as of August 1, 1978, as supplemented and amended to the date hereof (as so supplemented and amended, the "***Trust Agreement***"), by and between the Authority and U.S. Bank National Association, as successor-in-interest to State Street Bank and Trust Company, as trustee (the "***Trustee***"), and the Resolution adopted by the Members of the Authority on June [20], 2019 (the "***Resolution***"). All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Resolution.

We have examined the Act, a certified copy of the proceedings relating to the issuance of the 2019 Bonds, the Trust Agreement and the Resolution, the by-laws of the Authority, and certifications of Authorized Officers of the Authority (as defined in the Resolution) and other public officials and others, and such other laws and regulations as we have determined to be necessary in order to deliver this opinion. As to questions of fact material to our opinion, we relied upon those certified proceedings and certifications, without independently undertaking to verify them. With respect to matters other than federal tax matters, with your permission, we refer you to the legal opinion of even date of Kaplan Kirsch & Rockwell LLP, bond counsel. In rendering this opinion, we have relied on the legal opinion of even date of Kaplan Kirsch & Rockwell LLP.

Neither The Commonwealth of Massachusetts (the "***Commonwealth***") nor any political subdivision thereof, other than the Authority is obligated to pay any of the 2019 Bonds or the interest thereon, and neither the faith and credit nor the taxing power of the Commonwealth or any political subdivision thereof is pledged to the payment of the principal of and interest on the 2019 Bonds. The 2019 Bonds are secured on a parity with other Bonds heretofore and hereafter issued pursuant to the Trust Agreement and are secured by and payable solely from Revenues available therefor under the

Trust Agreement and Available Funds that have been irrevocably committed or are held by the Trustee or another fiduciary and are set aside exclusively to be used to pay principal of, interest or premium if any, on the 2019 Bonds pursuant to a resolution of the Authority. The Authority has no taxing power.

Based upon the foregoing, we are of the opinion that, under existing law, the interest on the 2019-B Bonds is excluded from gross income for federal income tax purposes. In addition, interest on the 2019-B Bonds is not a specific preference item for purposes of federal alternative minimum tax. The interest on the 2019C Bonds is excluded from gross income for federal income tax purposes, except for interest on any 2019C Bonds for any period during which such 2019C Bonds are held by a person who is a "substantial user" of the facilities financed with proceeds of the 2019C Bonds or a "related person" of such a substantial user within the meaning of Section 147(a) of the Internal Revenue Code of 1986, as amended (the "***Code***"). Interest on the 2019C Bonds is a specific preference item for purposes of federal alternative minimum tax. The opinions set forth in this paragraph are subject to the condition that the Authority comply with various requirements imposed by the Code that must be complied with after the 2019 Bonds are issued for interest on the 2019 Bonds to be, or continue to be, excluded from gross income for federal income tax purposes. The Authority has covenanted in the Trust Agreement and the Resolution that it will not take or permit to be taken on its behalf any action that would adversely affect the exemption from federal income taxation of the interest on the 2019 Bonds and that it will take or require to be taken such actions as may be reasonably within its ability and as may be required under applicable law to continue the exemption from federal income taxation of the interest on the 2019 Bonds. The Authority's failure to comply with such covenants may result in the inclusion of interest on the 2019 Bonds in gross income for federal income tax purposes, in some cases retroactively to the date the 2019 Bonds were issued. We have not undertaken to determine (or to inform any person) whether any actions taken (or not taken) or events occurring (or not occurring) after the date of issuance of the 2019 Bonds may adversely affect the tax status of interest on the 2019 Bonds. We express no opinion regarding any other federal tax consequences arising with respect to the 2019 Bonds.

In rendering the opinion above, we have relied upon federal tax law and interpretations thereof, as in effect on the date hereof. We express no opinion as to the impact of changes in federal income tax law which occur subsequent to the date hereof on the exclusion from gross income of the holders of the 2019 Bonds of the interest thereon and assume no duty to update this opinion or provide notice of changes in federal tax law or the impact thereof on the opinions rendered hereby.

The rights of the owners of the 2019 Bonds and the enforceability of the 2019 Bonds, the Trust Agreement and the Resolution may be limited by bankruptcy, insolvency, reorganization, moratorium and similar laws of general application affecting the rights and remedies of creditors and secured parties, and the availability of the remedy of specific enforcement, injunctive relief or other equitable relief is subject to the discretion of the court before which any proceeding therefore may be brought. We express no opinion as to the availability of any particular for of judicial relief.

Except as set forth in our supplemental opinion of even date, we have not been engaged or undertaken to review the accuracy, completeness, or sufficiency of the Official Statement dated July [ ], 2019 or other offering materials relating to the 2019 Bonds (except to the extent, if any, stated in the Official Statement), and we express no opinion as to those matters. We have not passed on any matters relating to the business, affairs, or condition (financial or otherwise) of the Authority and no inference should be drawn that we have expressed any opinion on matters relating to the ability of the Authority to perform its obligations under the Resolution or the Trust Agreement.

This letter speaks as of its date. We assume no duty to change this letter to reflect any facts or circumstances that later come to our attention or any changes in law. We express no opinion as to laws other than the federal laws of the United States of America. In acting as bond counsel, we have established an attorney-client relationship solely with the Authority.

Very truly yours,

Foley & Lardner LLP

APPENDIX H

**[FORM OF OPINION OF
KAPLAN KIRSCH & ROCKWELL LLP (CO-BOND COUNSEL)]**

July [ ], 2019

Massachusetts Port Authority
One Harborside Drive, Suite 200S
East Boston, Massachusetts 02128-2909

Re: Massachusetts Port Authority $[___________] Revenue Bonds, Series 2019-B (Non-AMT) and $[___________] Revenue Bonds, Series 2019-C (AMT)

Ladies and Gentlemen:

We have acted as bond counsel to the Massachusetts Port Authority (the "***Authority***") in connection with the issuance by the Authority of its $[____________] Revenue Bonds, Series 2019-B (Non-AMT) (the "***2019-B Bonds***") and its $[____________] Revenue Bonds, Series 2019-C (AMT) (the "***2019-C Bonds***") (the "***2019-B Bonds*** and the "***2019-C Bonds***", collectively referred to as the "***2019 Bonds***"). The 2019 Bonds are issued pursuant to Chapter 465 of the Massachusetts Acts of 1956, as amended to the date hereof (as so amended, the "***Act***"), the Trust Agreement dated as of August 1, 1978, as supplemented and amended to the date hereof (as so supplemented and amended, the "***Trust Agreement***"), by and between the Authority and U.S. Bank National Association, as successor-in-interest to State Street Bank and Trust Company, as trustee (the "***Trustee***"), and the Resolution adopted by the Members of the Authority on June [20], 2019 (the "***Resolution***"). All capitalized terms used herein and not otherwise defined shall have the respective meanings set forth in the Resolution.

We have examined the Act, a certified copy of the proceedings relating to the issuance of the 2019 Bonds, the Trust Agreement and the Resolution, the by-laws of the Authority, and certifications of Authorized Officers of the Authority (as defined in the Resolution) and other public officials and others, and such other laws and regulations as we have determined to be necessary in order to deliver this opinion. As to questions of fact material to our opinion, we relied upon those certified proceedings and certifications, without independently undertaking to verify them. With respect to the opinion regarding federal tax matters, with your permission, we refer you to the legal opinion of even date of Foley & Lardner LLP, special tax counsel.

Neither The Commonwealth of Massachusetts (the "***Commonwealth***") nor any political subdivision thereof, other than the Authority is obligated to pay any of the 2019 Bonds or the interest thereon, and neither the faith and credit nor the taxing power of the Commonwealth or any political subdivision thereof is pledged to the payment of the principal of and interest on the 2019 Bonds. The 2019 Bonds are secured on a parity with other Bonds heretofore and hereafter issued pursuant to the

Trust Agreement and are secured by and payable solely from Revenues available therefor under the Trust Agreement and Available Funds that have been irrevocably committed or are held by the Trustee or another fiduciary and are set aside exclusively to be used to pay principal of, interest or premium if any, on the 2019 Bonds pursuant to a resolution of the Authority. The Authority has no taxing power.

Based upon the foregoing, we are of the opinion that, under existing law:

1. The Authority is a body politic and corporate and public instrumentality of the Commonwealth duly created by the Act, with all necessary power and authority to adopt the Resolution, perform its obligations under the Resolution and issue the 2019 Bonds.

2. The 2019 Bonds have been duly authorized, executed, and delivered by the Authority and, assuming that the 2019 Bonds have been authenticated as provided in the Act and the Trust Agreement, the 2019 Bonds constitute legal, valid and binding obligations of the Authority, enforceable in accordance with their terms and entitled to the benefits and security of the Resolution and the Trust Agreement.

3. The Resolution and the Trust Agreement are authorized by the Act, the Trust Agreement has been duly authorized, executed and delivered by the Authority, and the Resolution and the Trust Agreement constitute legal, valid and binding obligations of the Authority, enforceable in accordance with their respective terms.

4. Under the Act, the 2019 Bonds, their transfer and the income therefrom (including any profit made on the sale thereof) are exempt from taxation within the Commonwealth. We express no opinion as to whether the 2019 Bonds or the interest thereon are included in the measure of Massachusetts estate and inheritance taxes and certain Massachusetts corporation excise and franchise taxes. We express no opinion regarding other Massachusetts tax consequences arising with respect to the 2019 Bonds, or regarding the tax consequences of states other than the Commonwealth.

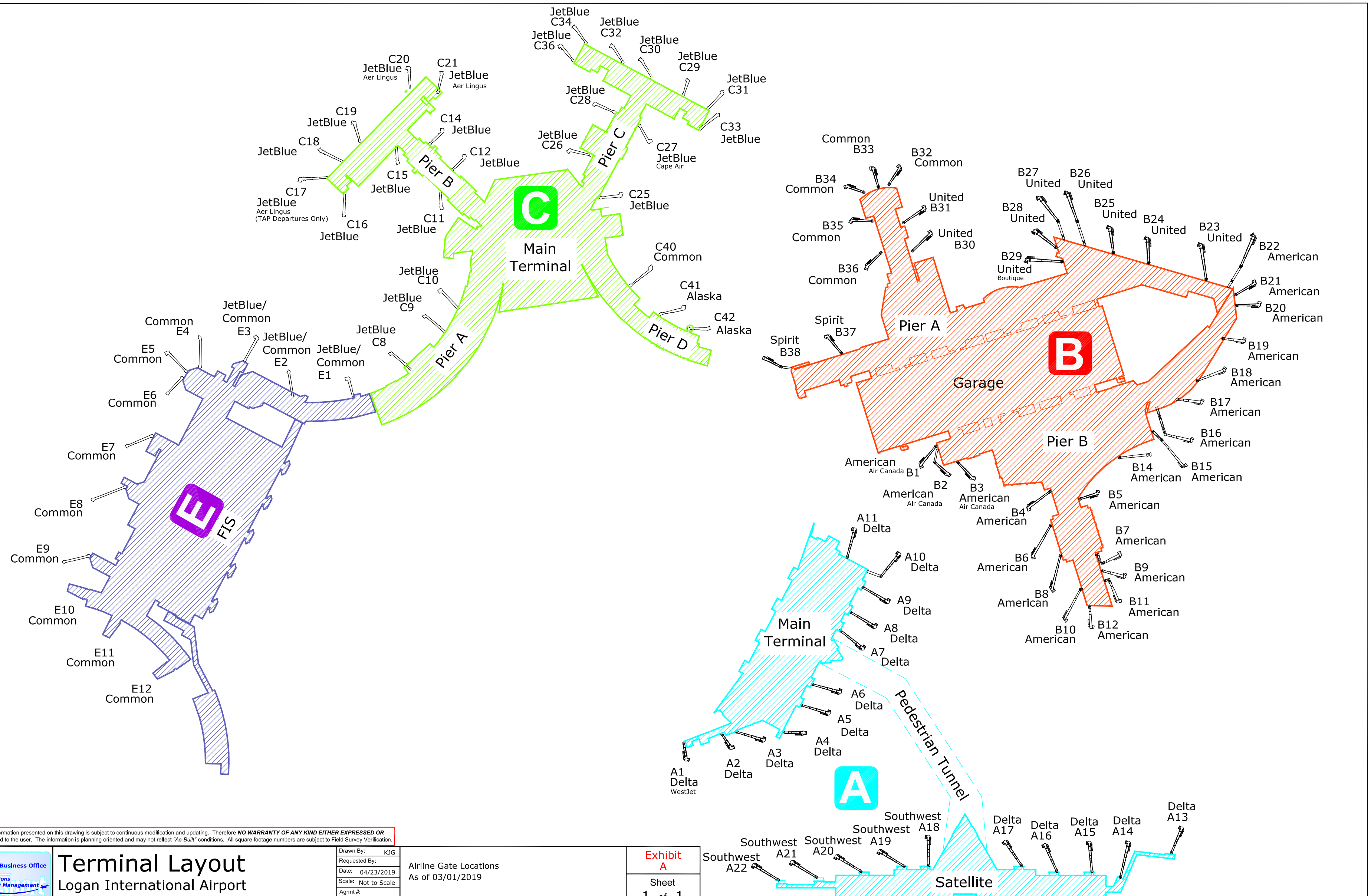
The rights of the owners of the 2019 Bonds and the enforceability of the 2019 Bonds, the Trust Agreement and the Resolution may be limited by bankruptcy, insolvency, reorganization, moratorium and similar laws of general application affecting the rights and remedies of creditors and secured parties, and the availability of the remedy of specific enforcement, injunctive relief or other equitable relief is subject to the discretion of the court before which any proceeding therefore may be brought. We express no opinion as to the availability of any particular for of judicial relief.

Except as set forth in our supplemental opinion of even date, we have not been engaged or undertaken to review the accuracy, completeness, or sufficiency of the Official Statement dated July [ ], 2019 or other offering materials relating to the 2019 Bonds (except to the extent, if any, stated in the Official Statement), and we express no opinion as to those matters. We have not passed on any matters relating to the business, affairs, or condition (financial or otherwise) of the Authority and no inference should be drawn that we have expressed any opinion on matters relating to the ability of the Authority to perform its obligations under the Resolution or the Trust Agreement.

This letter speaks as of its date. We assume no duty to change this letter to reflect any facts or circumstances that later come to our attention or any changes in law. We express no opinion as to laws other than the laws of the Commonwealth and the federal laws of the United States of America. In acting as bond counsel, we have established an attorney-client relationship solely with the Authority.

Very truly yours,

Kaplan Kirsch & Rockwell LLP



J:\ABO\Drawings\AIROPS\Gate Reference Maps\2019\2019-03-01 Gate Reference Map.dwg

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Airport Business Office
Leasing
Concessions
Property Management
massport

Terminal Layout

Logan International Airport

Logan International Airport - Massachusetts Port Authority - One Harborside Drive Suite 200S - East Boston, MA 02128-2909 - www.massport.com

Drawn By:	KJG
Requested By:	
Date:	04/23/2019
Scale:	Not to Scale
Agrmt #:	

Airline Gate Locations
As of 03/01/2019

Exhibit A

Sheet 1 of 1

MASSACHUSETTS PORT AUTHORITY • Revenue Bonds, Series 2019-B (Non-AMT) and Series 2019-C (AMT)

massport

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