

2017 ESPR Informational Meeting

Cathy Leonard-McLean Community Room
Logan Rental Car Center | October 29, 2019



Environmental Planning and Permitting
Strategic & Business Planning

Presentation Agenda

- **Introductions** Anthony Guerriero, Massport
Stewart Dalzell, Massport
- **MEPA Process** MEPA Office
- **Highlights of ESPR Contents/Findings** Stewart Dalzell
- **ESPR Schedule** Stewart Dalzell
- **Q&A** Anthony Guerriero

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MEPA Overview

- 2017 ESPR published in August 7, 2019 edition of the *Environmental Monitor*
- Comment period extended to November 18, 2019
- Comments can be submitted to:

The Honorable Kathleen A. Theoharides, Secretary
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Anne Canaday, EEA: #3247
100 Cambridge Street Suite 900
Boston, MA 02114

- New MEPA Comment Portal:

<https://eeaonline.eea.state.ma.us/EEA/PublicComment/Landing/>

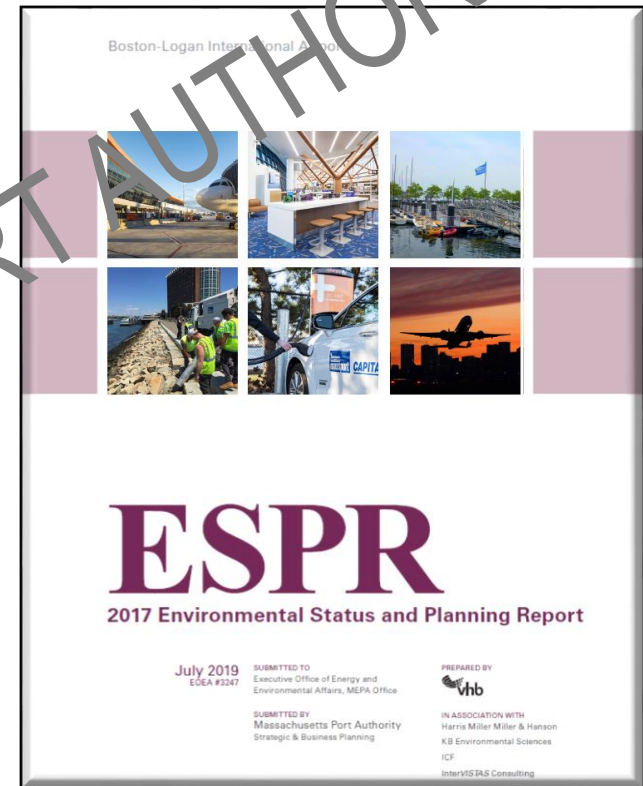
Logan Airport EDRs/ESPRs provide the longest detailed tracking of cumulative environmental impacts of any US airport

- Prepared for over 35 years
- Informs the public/regulators of the cumulative effects of Logan Airport operations and activities
- Allows individual projects to be considered in a broader Airport-wide context – *including those that fall below MEPA/NEPA review thresholds*
- Focus is on-airport analyses



ESPRs prepared every 5+ years – providing historical perspective and future look

1. Introduction/Executive Summary
2. Activity Levels/Forecasts
3. Airport Planning
4. Regional Transportation
5. Ground Access
6. Noise Abatement
7. Air Quality/Emissions Reduction
8. Environmental Compliance and Management/ Water Quality
9. Environmentally Beneficial Measures and Project Mitigation Tracking



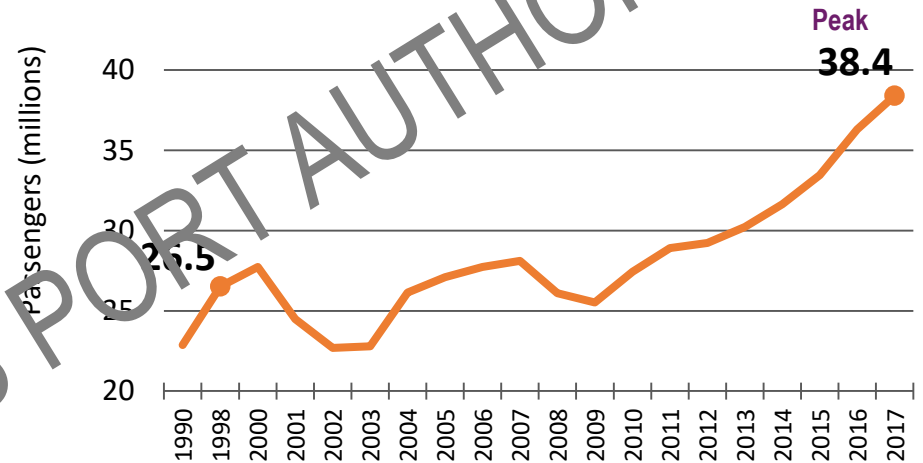
1. Logan Environmental Context

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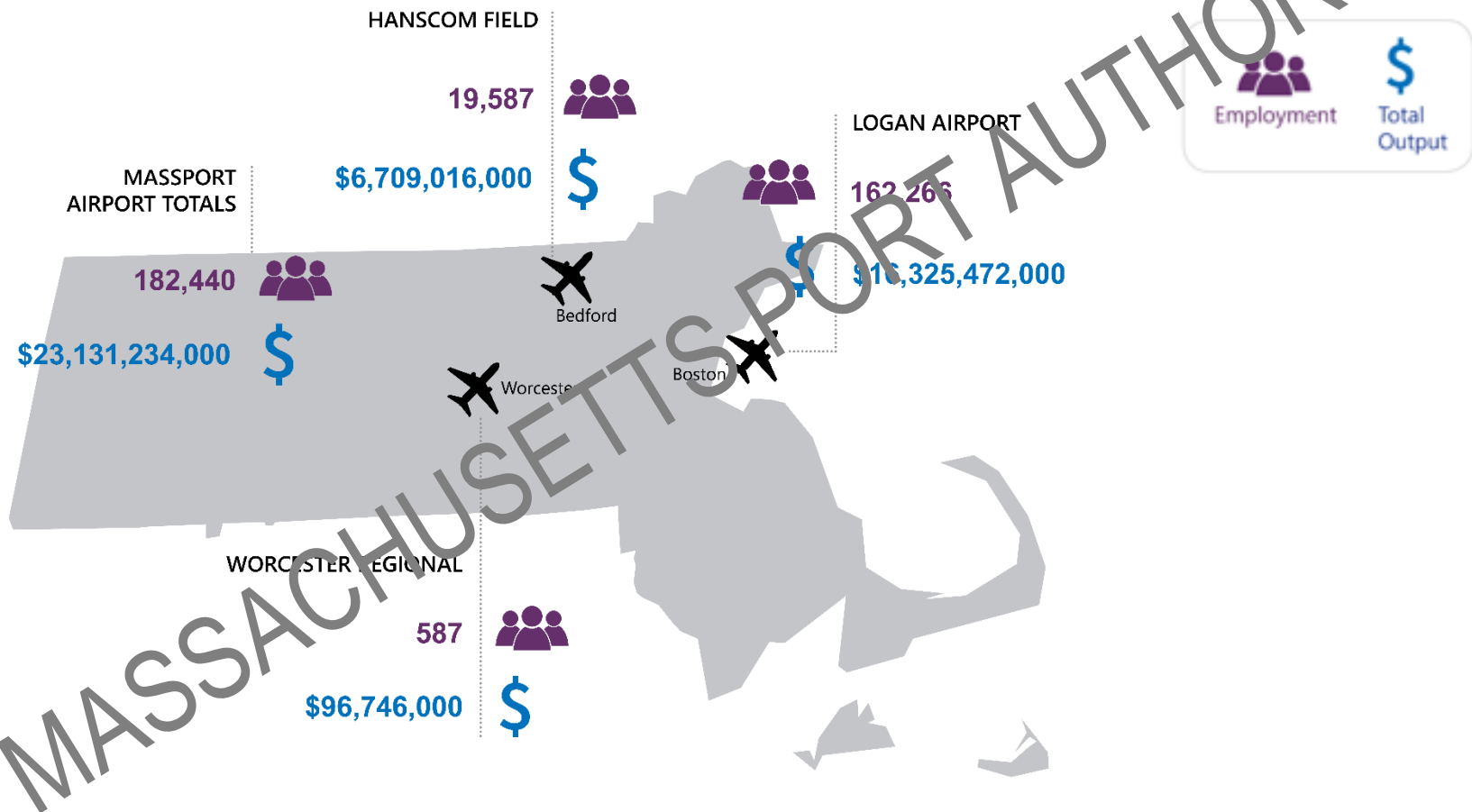
Recent strong passenger growth at Logan Airport reflects the economic characteristics of the region

- Low unemployment rate
 - Boston Metro Area 3.4% vs. U.S. 4.5% (2017)
- High income levels
 - Boston Metro per capita income 30% higher than U.S. average (2017)
- A well-diversified, travel intensive economic base: technology, biotech, financial services, education and healthcare
- Rich historical and cultural resources, and extensive tourism

Logan Airport Passengers, 1990-2017



Logan Airport is a key transportation and economic resource contributing over \$16 billion to MA annually



Massport has a comprehensive strategy to ensure that Logan grows in a sustainable and environmentally friendly way

- Strategic policy initiatives and infrastructure improvements
- Sustainability and resiliency investments
- Community support and partnerships
- Focus is on initiatives within Massport's control or influence



Logan Airport's Terminal B Optimization Project incorporates energy saving measures with View Dynamic Glass

A ground access strategy to increase HOV and reduce congestion

- Improve and expand Logan Express services
- Continue commitment to Silver Line and public transit
- Relocate Ride App (Uber & Lyft) operations to reduce empty vehicle trips (deadheads) and lessen curb congestion
- Add on-airport parking to reduce passenger drop-off/pick-up (2 trips vs. 4)
- Evaluate and implement on-airport infrastructure improvements to reduce congestion



Noise Abatement Strategy

- Partner with Airlines and the FAA to identify and implement noise abatement measures
 - Airlines retrofitting Airbus A319/320/321 aircraft with vortex generators
 - Collaborate with FAA and MCAC on RNAV Study
 - Continue to implement noise abatement measures, such as runway use restrictions and reduced engine taxiing
- Continue to seek FAA funding for Sound Insulation Program to soundproof eligible residences



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Targeted Air Quality strategies to reduce air emissions

- Replace gas and diesel-powered equipment and vehicles with electric alternatives
- Provide infrastructure to support alternative fuels including compressed natural gas and electricity
- Encourage practices that support reductions in aircraft emissions
- Advocate for and be involved in FAA national research efforts (e.g. UFP studies)
- Maximize use of HOV and reduce single occupancy vehicle trips
- Reduce emissions associated with Massport buildings, including energy needs



Massport has extensive Sustainability and Resiliency Programs

- Sustainability Master Plan and Annual Reporting
- Sustainable Design Standards and Guidelines
- Five LEED (Leadership in Energy and Environmental Design) Certified Facilities
- Climate Change and Resiliency Planning – 60% of critical assets enhanced
- Rooftop solar Installations
- Commitment to Community Parks and Open Space

Massport Operates Over 36 acres of parks and open space in East Boston



2. Activity Levels

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Logan is more efficient, serving more passengers with fewer flights

- Passengers reached a record 38.4M in 2017, up 5.9% over 2016
- Aircraft operations increased more slowly at 2.6%, reaching 401,371 over 2016
- Since 1998 - the peak year for operations - passengers increased by 45% while aircraft operations decreased 21%*

Year	Air Pax	% Change	A/C Ops	% Change	Average #PAX/OP
1990	22,878,191	-	424,568	-	53.9
1998	26,526,708	15.9%	507,449	19.5%	52.3
2000	27,725,833	2.5%	487,996	(1.4%)	56.8
2010	27,428,962	7.5%	352,643	2.1%	77.8
2011	28,907,938	5.4%	368,987	4.6%	78.3
2012	29,235,643	1.1%	354,869	(3.8%)	82.4
2013	30,218,631	3.4%	361,339	1.8%	83.6
2014	31,634,445	4.7%	363,797	0.7%	87.0
2015	33,449,580	5.7%	372,930	2.5%	89.7
2016	36,288,042	8.5%	391,222	4.9%	92.8
2017	38,412,419	5.9%	401,371	2.6%	95.7
2018	40,941,925	6.6%	424,024	5.6%	96.6

Passengers per operation continues to improve



* Growth from 1998 to 2017.

ESPR evaluates operational and environmental conditions for a Future Planning Horizon

Activity	2017	Next 10-15 Years	Growth
Passengers (M)	38.4	50.1	1.5% per year
Aircraft Operations	401,371	486,364	1.1% per year
Passengers per Operation	95.7	103.0	7.6% over 2017

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3. Airport Planning

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Logan Parking Project – Final EIR/EA in Preparation

- Logan Parking Freeze – addition of 5,000 spaces
 - Approved by MassDEP – 2017
 - Approved by US EPA – 2018
- Phasing of 5,000 spaces:
 - Phase 1 - 2,000-space garage in the parking lot in front of Terminal E
 - Phase 2 - 3,000-space addition to the Economy Garage
- On-airport locations selected with community input (LIAG)



Massport is implementing new Ride App infrastructure and policies to reduce congestion

- Began tracking Ride App trips in 2017
 - 12 million vehicles trips in 2018 (incl. deadheads)
- Robust plan to manage Ride App operations and reduce empty trips (Phase 1 went into effect October 28, 2019)
 - Relocate pickup and drop-off to new Ride App areas in Central Parking to allow rematch
 - New fee structure to encourage shared rides and competition between modes
 - Reduces on-airport and gateway congestion



Ground transportation strategies to build on Logan Express successes are underway

- **Goal is to double Logan Express ridership from 2 million to 4 million annual passengers**
- **Suburban Logan express enhancements**
 - Braintree service expanded from 2 to 3 trips/hour (May 2019)
 - Planning/Permitting for Framingham garage expansion
 - In total, 3,000 additional suburban spaces are planned for Braintree & Framingham
 - Pursuing new suburban Logan Express locations
 - Adding amenities, such as priority security line status
- **Urban Logan Express service improvements**
 - Relocated Back Bay Logan Express service with reduced/free fares and priority security line status (May 2019)
 - New urban Logan Express service at North Station planned for 2020 (buses ordered)
 - Adding amenities, such as priority security line status



MassDEP Logan Parking Freeze Amendment Technical Studies recently completed – *early findings already being implemented*

- **Study 1:** Logan Airport Ground Access High-Occupancy Vehicle Services
- **Study 2:** Logan Airport Ground Access High-Occupancy Vehicle Pricing
- **Study 3:** Logan Airport Ground Access and Reducing Non-High-Occupancy Vehicle Operations

The DEP studies are posted on the Massport website:

<http://www.massport.com/media/3370/final-massport-dep-report.pdf>

Terminal E Modernization Project Underway

- Seven new gates - three gates approved in 1996 as part of the International Gateway West Concourse Project, but never constructed, and an additional four gates
- Community noise reduction benefit
- Connection to MBTA Blue Line
- Initial construction staging underway



ESPR provides updates and previews of other planning projects

<p>Design/ Planning</p>	<ul style="list-style-type: none"> • Piers Park Phase II • On-Airport Congestion Relief Infrastructure • Framingham Logan Express Garage Expansion • Jet Fuel Storage Addition • Runway 9-27 Runway Safety Area Improvement Project
<p>Permitting</p>	<ul style="list-style-type: none"> • Logan Parking Project
<p>Construction</p>	<ul style="list-style-type: none"> • Terminal C, Pier B Optimization • Terminal C Canopy, B-C Connector, and Terminal C Roadways Project
<p>Completed</p>	<ul style="list-style-type: none"> • Convenience and Filling Station, Taxi Pool and Ride App Lot Relocations • Terminal B Optimization

Massport continues to pursue LEED or other rating system certifications for new buildings

- Logan Airport Parking Project
- Terminal B Optimization
- Terminal E Modernization
- Terminal C, Pier B Optimization
- Terminal C Canopy, Connector, and Roadway Project
- Relocated Convenience/Service Station



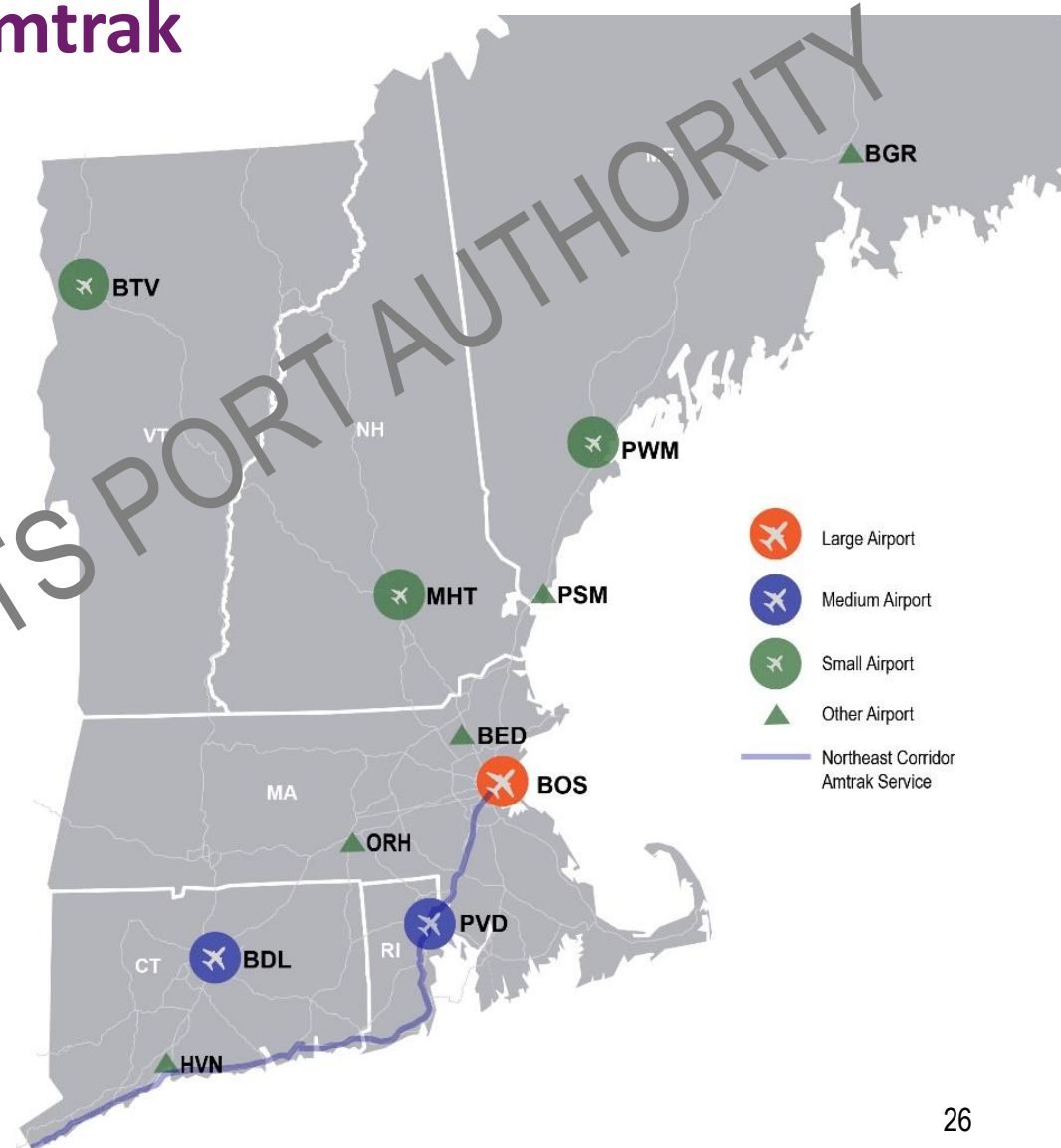
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4. Regional Transportation

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New England is served by a system of regional airports and Amtrak

- Airline service increased at Worcester Regional, Bradley Int'l, T.F. Green, Portland Int'l, and Burlington Int'l in 2017
- Manchester and Tweed-New Haven experienced a decrease in services in 2017
- Amtrak ridership remained flat at about 32 million in 2017 but grew to over 33 million in 2018



Massport continues to invest in Worcester and Hanscom airports to offer more choices for passengers

Worcester Regional Airport

A Growing Base of Commercial Airline Services



Hanscom Field

New England's Premiere Business Aviation Airport



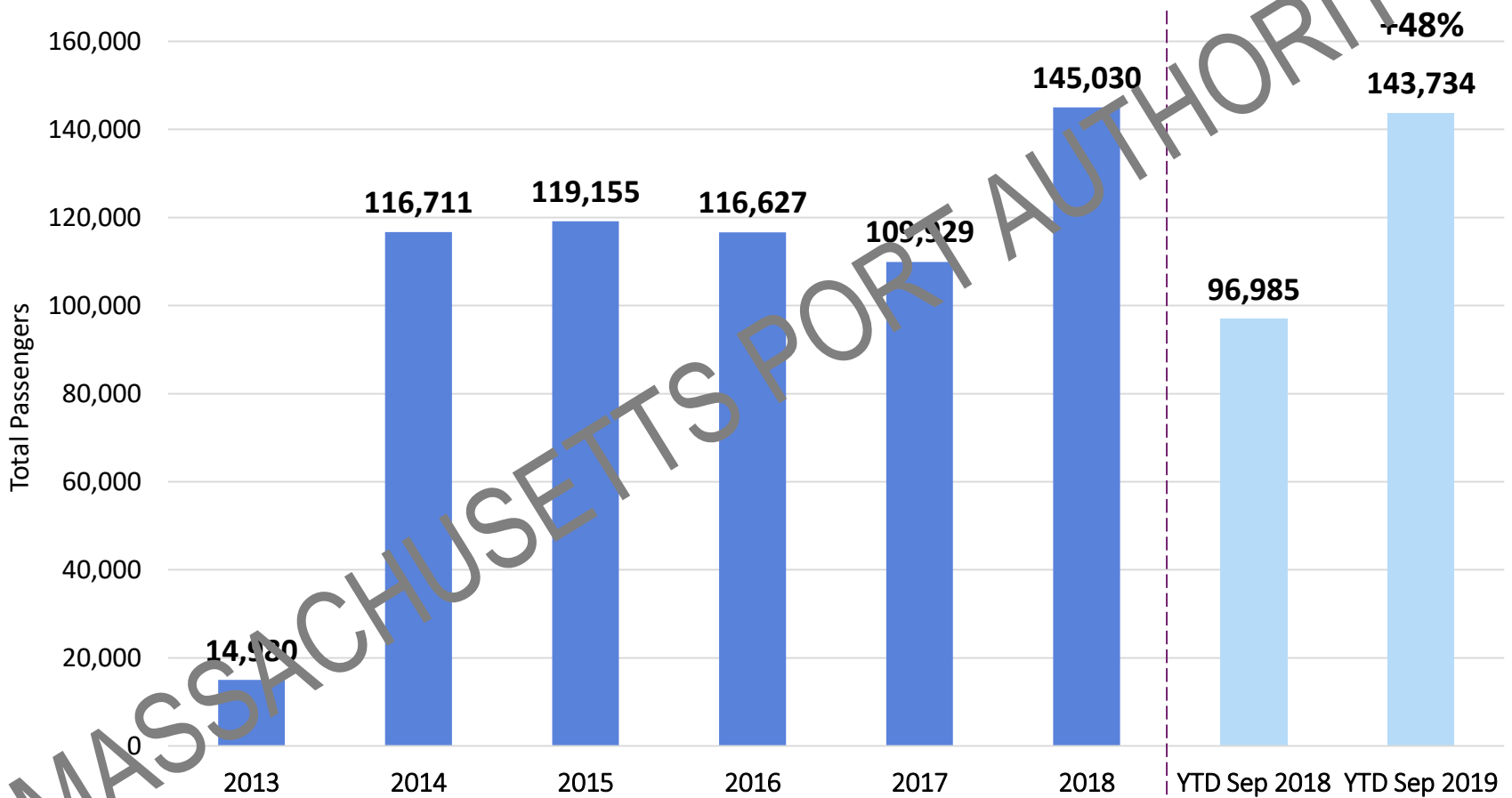
Worcester Regional Airport has served over 750,000 passengers since 2013

- Massport investing \$100 million to revitalize facilities and attract commercial operations
- New Category III Instrument Landing System (ILS) has significantly improved ORH's all-weather reliability (*Opened March 2018*)
- Recent service additions:
 - JetBlue service to JFK started May 2018
 - American Airlines service to Philadelphia started in October 2018
 - Delta Air Lines service to Detroit started in August 2019



CAT III Instrument Landing System.
Source: Massport.

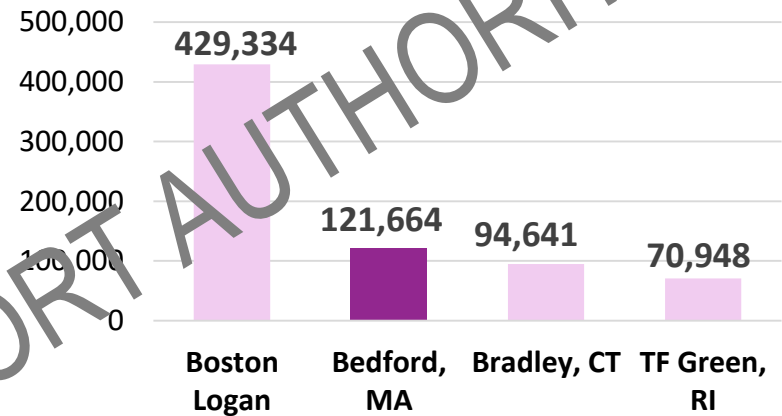
Passenger activity at Worcester Regional Airport is up by 48% for YTD September



Hanscom Field is New England's premiere general/business aviation airport

- Second busiest airport in New England based on aircraft operations
- Serves as a reliever to Logan Airport
- New Jet Aviation FBO now open
- RFP issued in 2018 for redevelopment of site west of former Navy Hangar
 - EA for development complete - property approved for corporate hangar use
- RFP issued in March 2019 for design services associated with replacement of the Pine Hill T-Hangars to a 7-acre site west of the Navy Hangar
 - Construction of 38 T-Hangars and supporting taxiway anticipated to start in Spring 2020

Aircraft Operations at NE Airports CY2018



5. Ground Access

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Ground access to and from Logan Airport

- Logan continued to be one of the top U.S. airports for HOV and transit mode share
- Logan Express ridership from suburban locations increased by over 6% from 2016 to 2017
- Massport has updated its goals and definition of HOV to consider vehicle occupancies of taxis, black car, limousines, and Ride App trips that exceed one air passenger per vehicle to be HOV
- Committed to a goal of 35.5% HOV by 2022 and 40% by 2027

Hierarchy of Ground-Access Mode Choices (Based on Vehicle Trips per Passenger)

Fewest Vehicle Trips



Future vehicle miles traveled (VMT) projected to decrease due to HOV, operational and roadway improvements

- Logan Express improvements and expansion
- MBTA Silver Line increased frequency
- Ride App relocation plan to reduce deadheads by enabling rematch and incentivizing shared rides
- Infrastructure improvements to reduce on-airport congestion and increase intra-terminal connectivity

	Average Weekday VMT	Average Weekday % Change
2000	173,793	--
2010	162,885	--
2015	168,791	6.5%
2016	176,841	4.8%
2017	196,503	11.1%
Future	180,000	(9%)

Notes: Percent change for 2015 is comparing to 2014 (not shown).

6. Noise

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Massport is encouraging airlines to retrofit Airbus A319/320/321 family with noise reducing vortex generators

- Reduces tonal noise on approach
- United Airlines began retrofitting aircraft in 2017 as part of schedule maintenance (multi-year effort)
- JetBlue announced plans to retrofit its older Airbus fleet by 2021 in an October 2018 press release
- Reflects partnership between Massport and the airlines to reduce aircraft noise to benefit surrounding communities



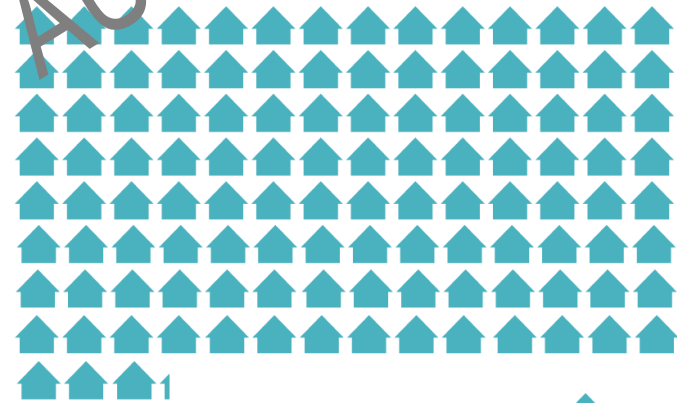
Image of Vortex Generator Device by Port on Wing.

Massport has a comprehensive Sound Insulation Program

- To date, Massport has provided sound insulation for a 11,515 units
- Massport will continue to work with FAA to sound insulate eligible homes



11,515 residences have received sound insulation treatment

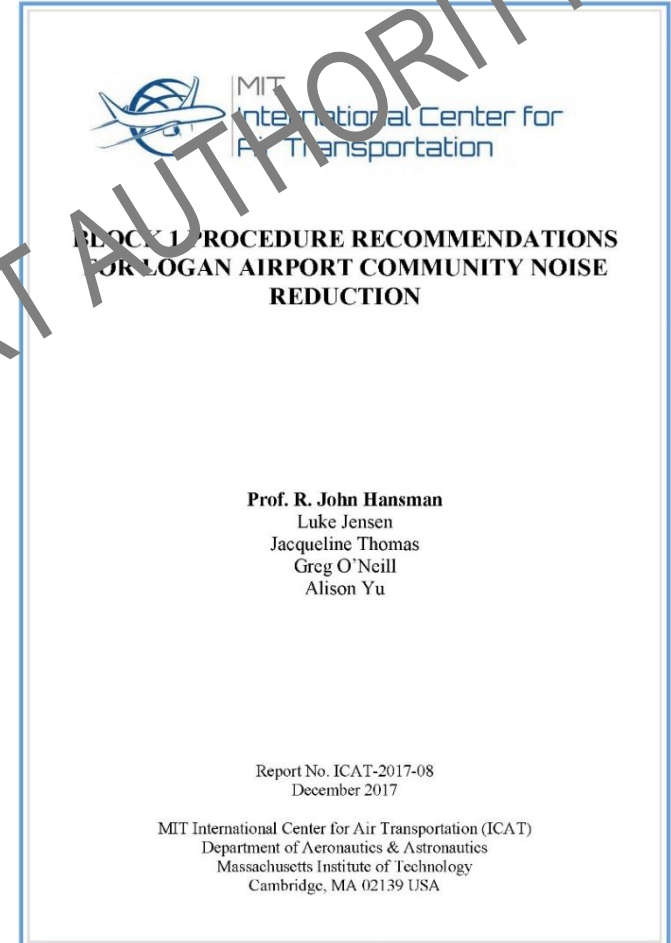


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Massport and FAA are collaborating on an RNAV Pilot Program Initiative

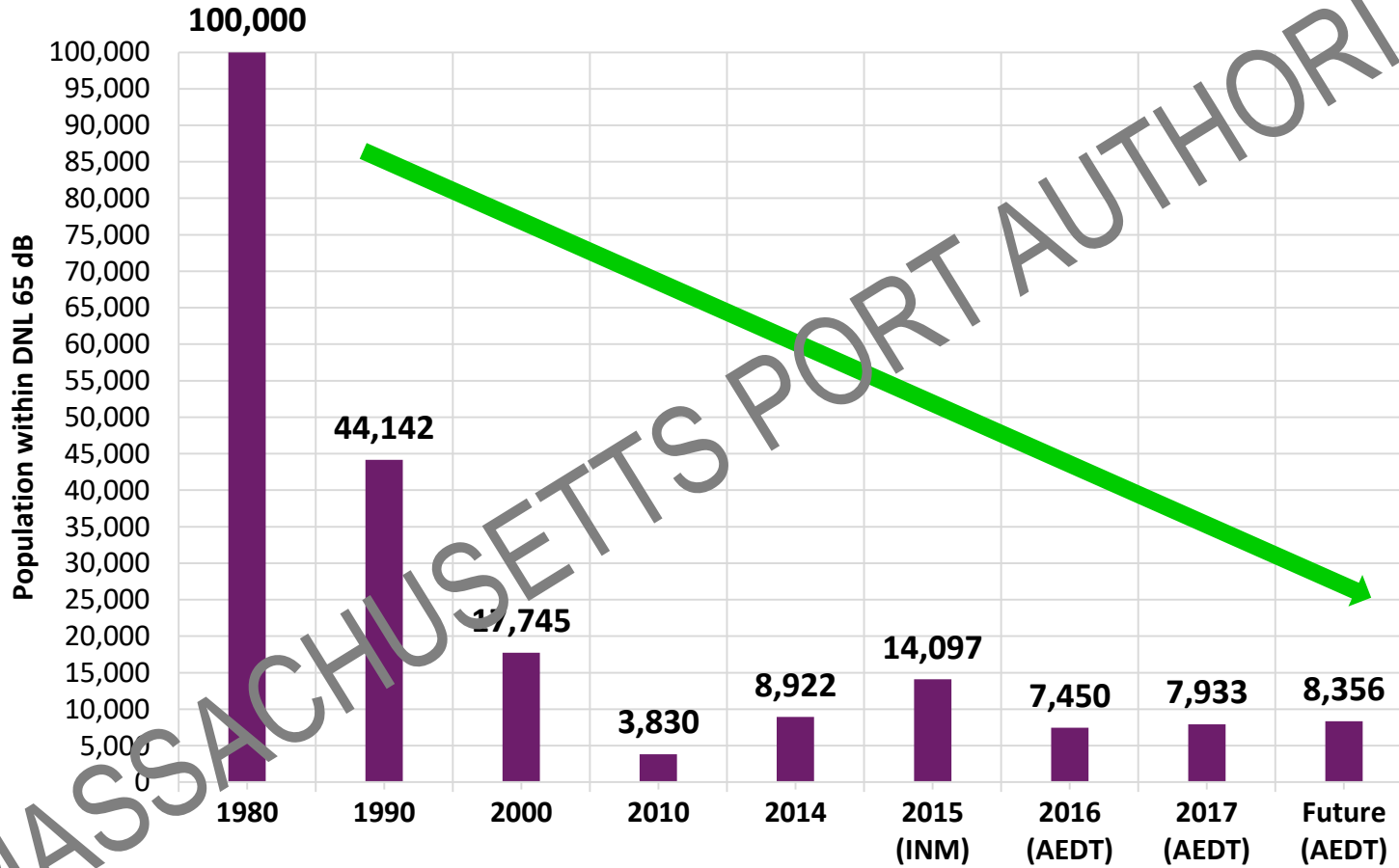
- Massport/FAA signed an MOU for an RNAV Study to address concentration of noise as a result of RNAV procedures (MIT technical lead)
- Coordinating with Massport CAC (MCAC) for review and input
- Study Separated into two phases: Block 1 and Block 2
- Block 1 recommendations:
 - Submitted to FAA December 2017
 - Massport CAC voted to approve and recommended implementation
 - FAA review began in 2018 and is ongoing
- Block 2 analysis is underway



Almost 98% of Logan’s commercial jet fleet meets at least Stage 4 noise classification requirements

Year	Stage 5 Requirements	Stage 4 Requirements	Certificated Stage 3	Recertificated Stage 3	Stage 2 (Greater than 75,000 lbs.)	Total
1990	N/A	N/A	51.1%	0.0%	48.9%	100%
1998	N/A	N/A	65.9%	21.7%	12.4%	100%
2000	N/A	N/A	75.0%	24.0%	1.0%	100%
2010	N/A	93.2%	5.7%	1.1% ⁴	0.0%	100%
2015	N/A	96.7%	3.3%	0.0%	0.0%	100%
2016	17.8%	79.2%	3.0%	0.0%	0.0%	100%
2017	17.7%	79.8%	2.4%	0.0%	0.0%	100%

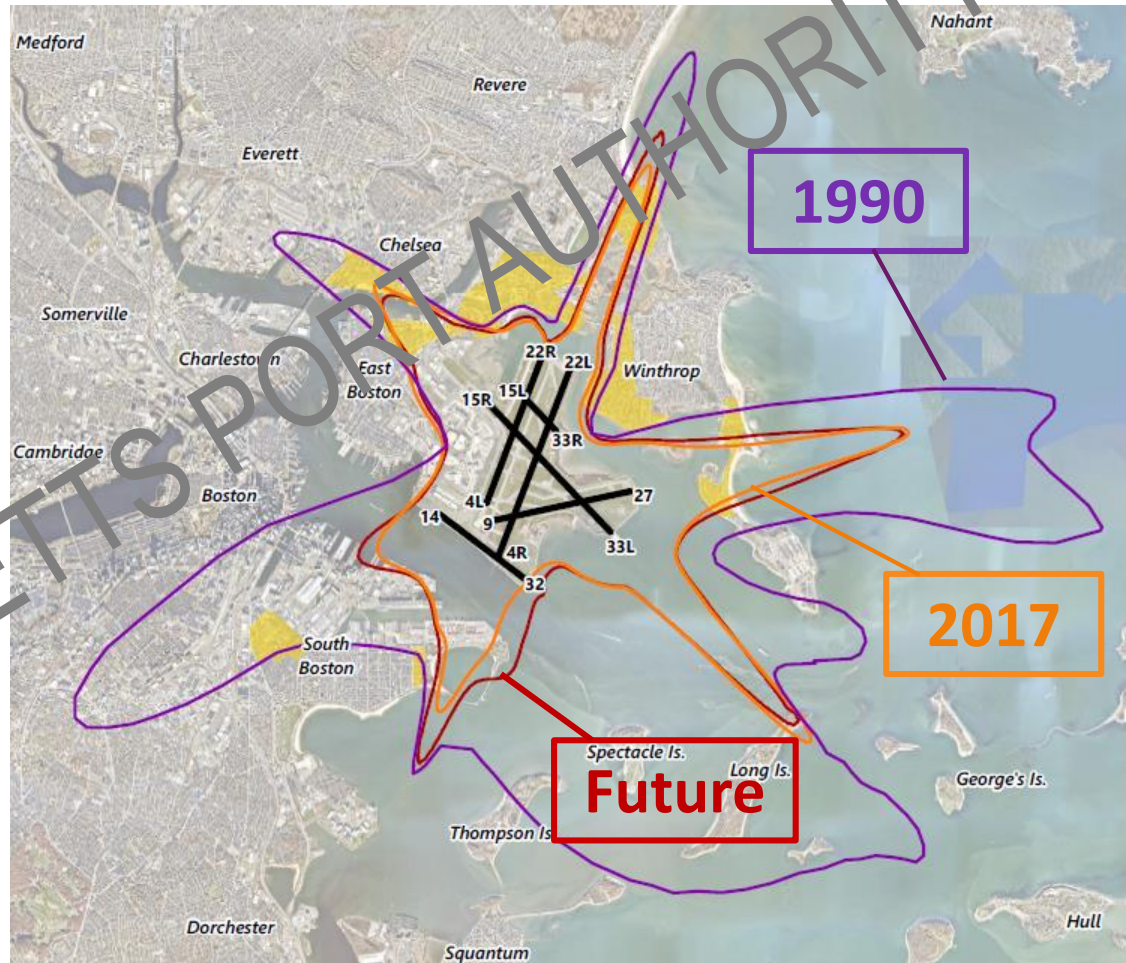
Population within DNL 65 dB contour projected to remain well below historic peaks



In 2016 FAA transitioned from the legacy Integrated Noise Model (INM) to the Aviation Environmental Design Tool (AEDT).

Future Contour is larger than 2017 – modest growth in population within DNL 65 dB contour compared to today

- 2017 contour driven by:
 - Increase in Runway 33L departures
 - 2017 Runway 4R closure
 - Increase in nighttime operations
- Fleet modernization/fleet mix – quieter aircraft will offset some of the future growth in operations
- Current and future contours are within areas already soundproofed by Massport



7. Air Quality

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Massport conducts a comprehensive annual Air Quality Emissions Analysis

- 2017 ESPR uses FAA's AEDT Model for emissions analyses
- Model inputs include aircraft operations, fleet mix, airfield taxi times, GSE equipment usage, motor vehicle traffic volumes, and stationary source utilization rates
- Emissions modeled for all stationary and mobile sources, based on operations:
 - CO (Carbon Monoxide)
 - NOx (Oxides of nitrogen)
 - VOCs (Volatile Organic Compounds)
 - PM (Particulate matter)
 - GHG (Greenhouse Gases)

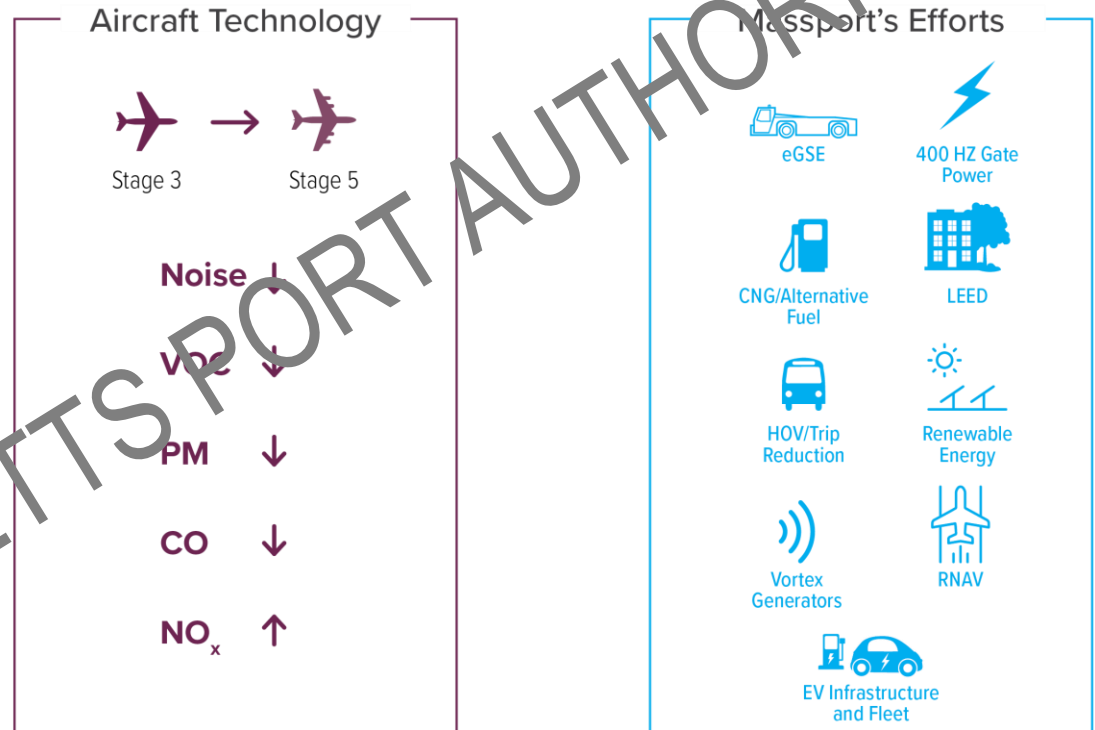
Aircraft technology has evolved over time

Benefits:

- Quieter Engines
- Greater fuel efficiency
- Decreasing VOC, PM and CO Emissions

Trade-offs

- Increased NO_x Emissions



Massport's strategy complements improvements in technology by focusing on reducing emissions and noise in all areas it can influence

Most emissions are projected to decline

	2000 (kg/day) (EDMS, MOBILE 6.0)	2016 (kg/day) (AEDT2c, MOVES2014a)	2017 (kg/day) (AEDT2d, MOVES2014b)	2016 to 2017 % Change	2000 to 2017 % Change	Future Planning Horizon	2017 to Future % Change
↓ CO	13,111	7,350	7,092	3.5% decrease	45.9% decrease	6,930	2.3% decrease
↓ VOCs	1,777	1,280	1,273	0.6% decrease	28.4% decrease	1,178	7.5 % decrease
↓ PM	N/A	96	77	20.1% decrease	N/A	74	2.9% decrease
↑ NO _x	5,707	5,300	5,935	12.0% increase	4.0% increase	8,151	37.3% increase

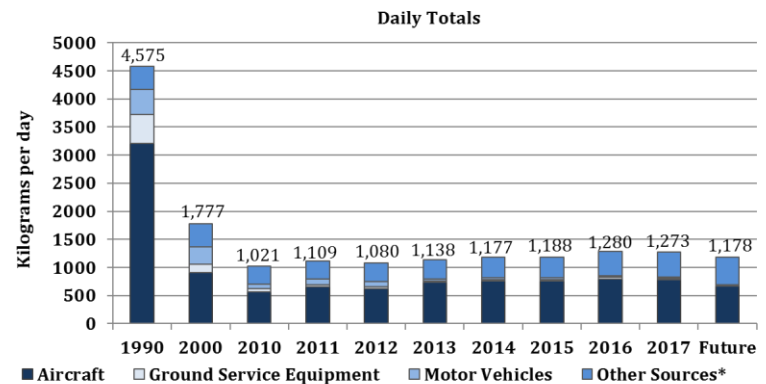
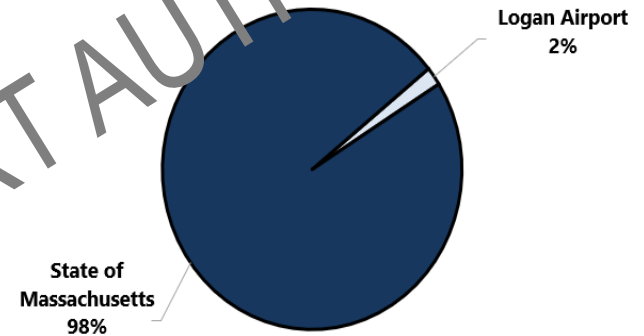
CO, VOCs, and PM declined and will continue to decline due to:

- Conversion of GSE to all electric versions
- Cleaner/more efficient motor vehicles
- Changes in aircraft fleet mix

VOCs and NO_x combine to form ozone

- **Boston Metropolitan Area is presently designated as Attainment/Unclassifiable for ozone**, meaning that the area complies with the NAAQS for this pollutant
- **Ozone is a regional issue - transport of NO_x and VOCs from outside the region is significant**
 - Logan contributes about 2% of the statewide NO_x emissions
- **In the Boston area, where VOCs are the most important in ozone formation, the reductions in VOCs at Logan help to moderate the effects of NO_x**

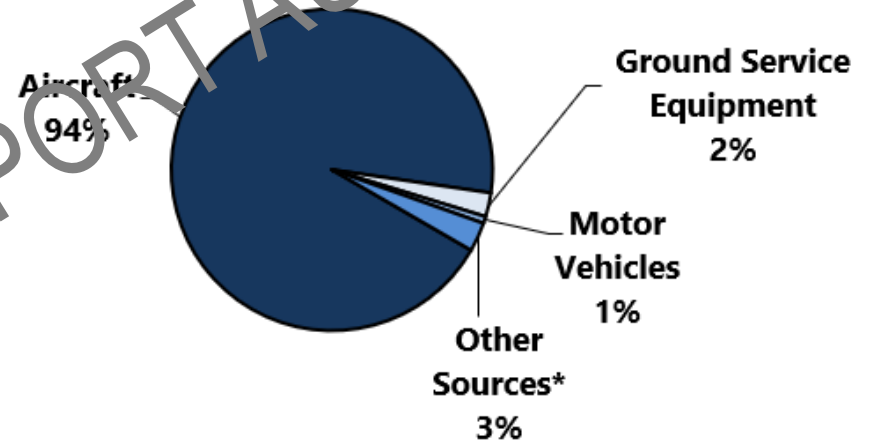
Logan Airport 2017 NO_x emissions compared to statewide emissions



Massport's initiatives have contributed to decreases in NO_x emissions from sources under its control!

- Investing in cleaner and more efficient fuel combustion technologies
- Modernizing airport boilers, emergency generators, and snowmelters over the next 2 years
- NO_x emissions associated with ground service equipment, motor vehicles, and stationary sources have declined from 2016 to 2017
 - Stationary Sources: 3% ↓
 - Ground Service Equipment: 15% ↓
 - Motor vehicles: 28% ↓

Sources of NO_x Emissions, 2017



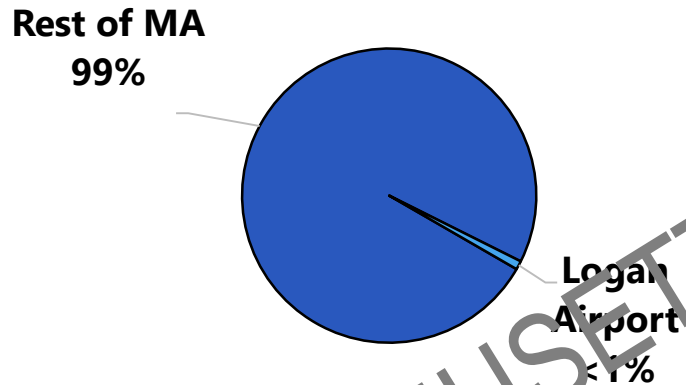
Greenhouse Gas (GHG) emissions are tracked by sources

Consistent with ACRP guidelines, the GHG emissions sources are defined as:

- **Scope 1/Direct** – GHG emissions from sources that are owned and controlled by Massport
 - Examples: stationary sources and Airport-owned fleet motor vehicles
- **Scope 2/Indirect** – GHG emissions associated with the generation of electricity consumed
 - Generated off-site at public utilities
- **Scope 3/Indirect and Optional** – GHG emissions that are associated with the activities of Massport from sources that are owned and controlled by others
 - These include aircraft-related emissions, emissions from Airport tenant activities, as well as ground transportation to and from the Airport

Total Logan GHG emissions are less than 1% of statewide emissions

Statewide GHG Emissions



GHG emissions breakdown:

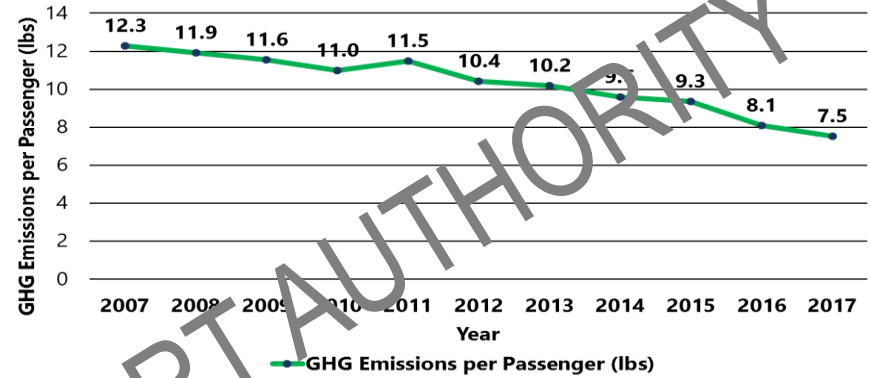
- Massport-Controlled- 12%
- Aircraft, GSE, tenant-based- 71%
- Purchased Electricity- 7%
- Passenger ground access vehicle- 11%

Logan GHG Emissions increased about 8% from 2016 to 2017

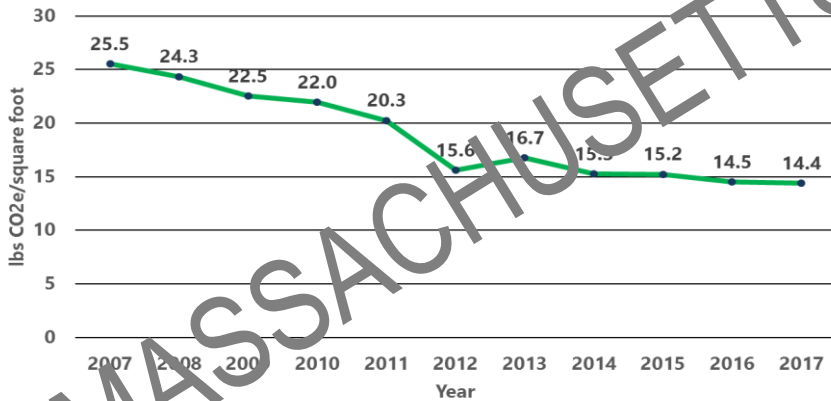
- Largely due to increase in aircraft operations and on-Airport VMTs

Several GHG metrics tracked by Massport have declined since 2007

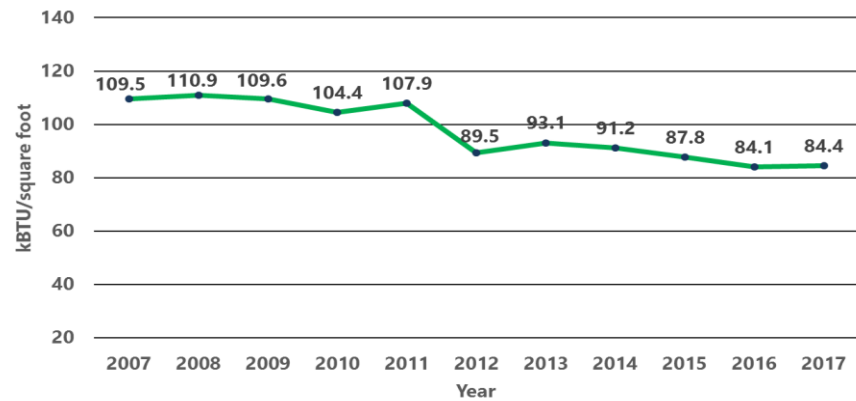
GHG Emissions (Scopes 1 and 2) per Passenger (lbs CO₂e), 2007-2017



Building GHG Emissions (lbs CO₂e) per Square Foot, 2007-2017



Building Energy Use Intensity (kBtu/Square Foot), 2007-2017



Massport has a strategy to reduce emissions

- Commitment to **Sustainable Design Standards and Guidelines**
- Constructing and operating facilities to **LEED®** standards and other green-rating systems
- Ongoing **energy efficiency projects**, such as converting to light-emitting diode (LED) lighting and upgrading to energy-efficient heating, ventilation, and air conditioning (HVAC) equipment
- Installation of **on-site renewable energy sources**, including solar and wind

Terminal E Modernization

- Additional aircraft gates will reduce emissions by decreasing aircraft taxi-delay time; use of auxiliary power units; and use of aircraft tractors, buses and other ground support equipment

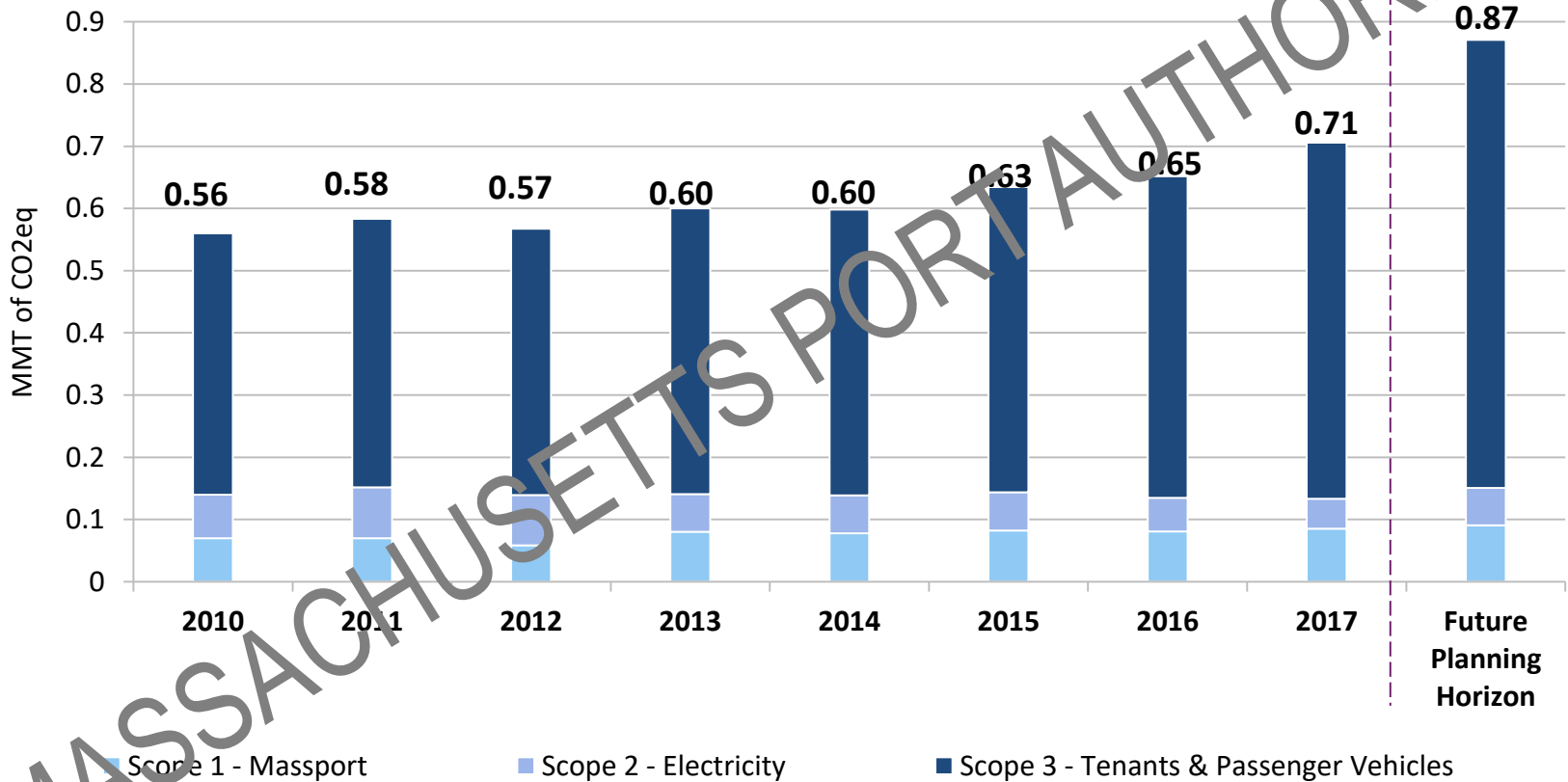
Logan Airport Parking Project

- On-site solar photovoltaic systems are anticipated to provide nearly 330,000 kilowatt hours/year and avoid 116 tons of CO₂ emissions/year

Most emissions are controlled by airlines, Airport tenants, and the general public through emissions from motor vehicles

**Aircraft emissions are driving projected GHG increases –
Massport programs will offset some of the projected growth**

Total Logan GHG Emissions



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Summary of Massport's operational and infrastructure strategies aimed at reducing GHGs

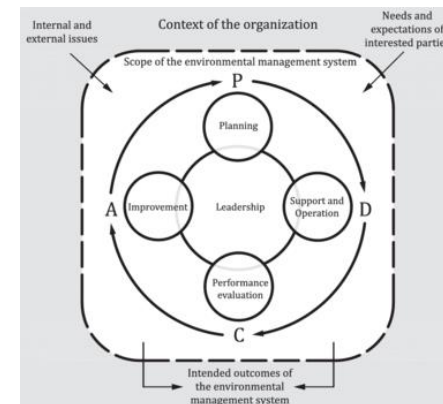
- Ground service equipment (GSE) electrification program
- Continued investment in Logan Express and HOV travel modes
- Provide pre-conditioned air/400 Hz power at all aircraft contact gates to allow planes to plug-in and minimize auxiliary power unit (APU) use
- Energy efficiency projects, LEED buildings, renewable energy
- Clean fuel vehicles/bus fleets
- Aircraft single engine taxiing procedures
- Parking strategy to reduce passenger trips/emission

8. Environmental Compliance and Management/ Water Quality

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Update on Water Quality and Environmental Management Plan

- Massport reports water quality compliance per state and federal regulations
- In 2017, 100% of Massport's stormwater samples were in compliance with *National Pollutant Discharge Elimination System* (NPDES) permit requirements
- ISO 14001 Certification - most recent *Environmental Management System* certification issued in 2017
- Ongoing MCP site assessment and remediation

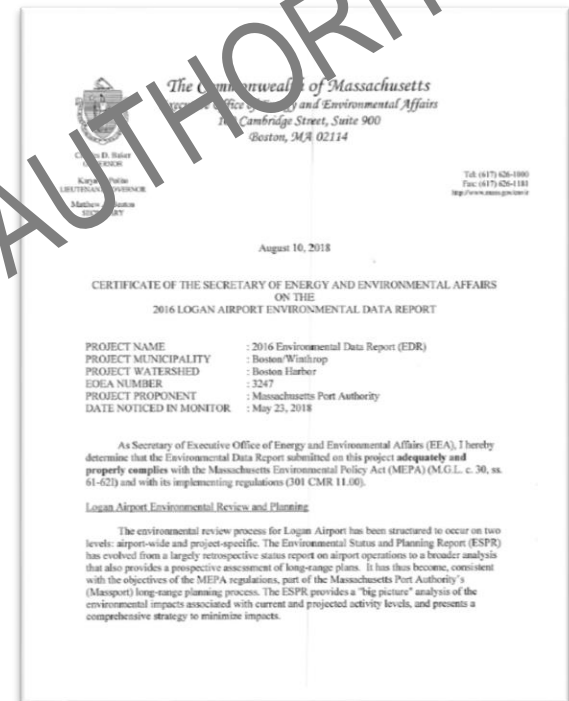


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Next Steps

Proposed Scope for 2018/2019 EDR

- Appendix C of the *2017 ESPR* presents the Proposed Scope for the *2018/2019 EDR*
- Massport has requested a combined EDR, which will report 2018 and 2019 environmental conditions
- The *2018/2019 EDR* would be a two-year EDR to then be followed by yearly EDRs
- The Secretary's Certificate on the *2017 ESPR* will serve as the Scope for the next document



Review schedule for the 2017 ESPR

- ✓ • **July 30, 2019** 2017 ESPR filed with MEPA
- ✓ • **August 7, 2019** Extended Comment Period Opens
- ✓ • **October 29, 2019** 6:00 PM Public Information Meeting at the Logan Rental Car Center
(*Cathy Leonard-McLean Community Room*)
- **November 18, 2019** **MEPA Comment Period Closes**
- **November 25, 2019** Secretary's Certificate/Scope for *2018/2019 EDR* Issued

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Submit 2017 ESPR Comments by November 18th to:

- The Honorable Kathleen A. Theoharides, Secretary
Executive Office of Energy and Environmental Affairs (EEA)
Attn: MEPA Office
Anne Canaday, EEA: #3247
100 Cambridge Street, Suite 900
Boston, MA 02114

New MEPA Public Comments Portal:

<https://eeaonline.eea.state.ma.us/EEA/PublicComment/Landing/>

- Please forward copies of your comments to:
sdalzell@massport.com

THANK YOU!



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