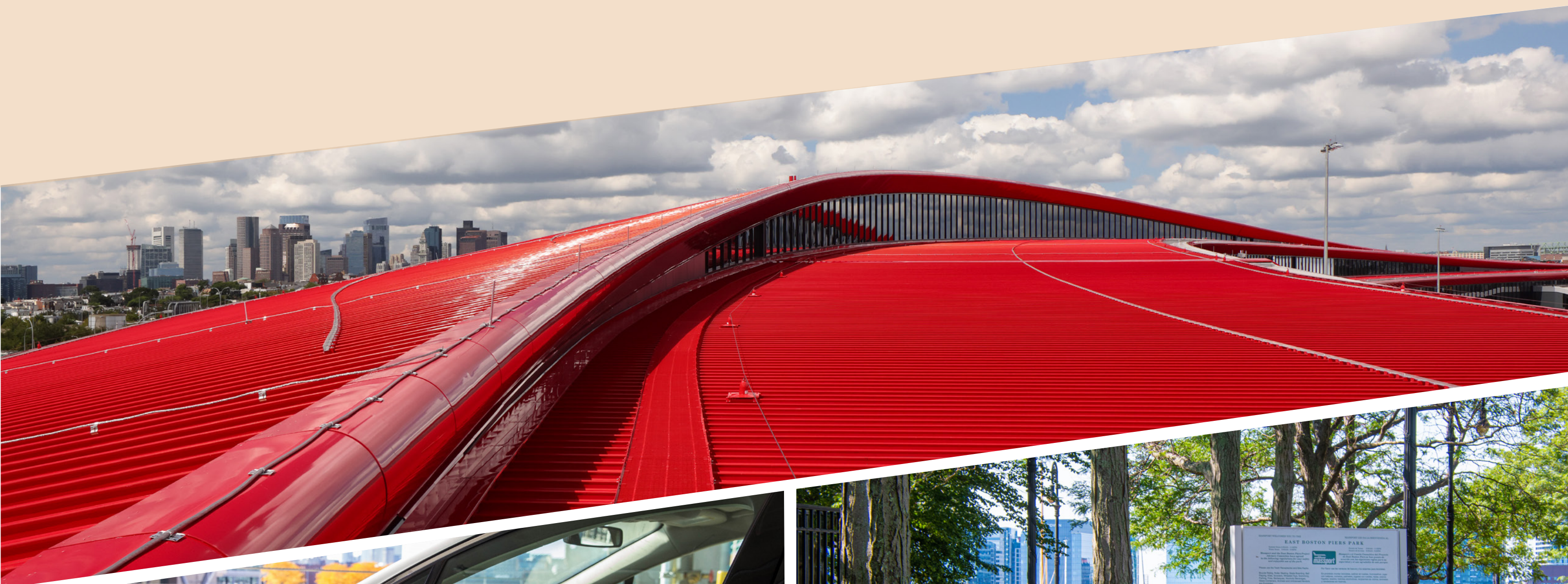
BOSTON LOGAN INTERNATIONAL AIRPORT

2022 ESPR

ENVIRONMENTAL STATUS AND PLANNING REPORT



May
2024

EEA #3247

SUBMITTED TO

Executive Office of Energy
and Environmental Affairs,
MEPA Office

SUBMITTED BY

massport

Massachusetts Port Authority
Strategic & Business Planning

PREPARED BY

vhb

IN ASSOCIATION WITH

Harris Miller Miller & Hanson
Crawford, Murphy & Tilly
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May 31, 2024

The Honorable Rebecca Tepper, Secretary
Executive Office of Energy and Environmental Affairs
Attn: Jennifer Hughes, EEA 3247
100 Cambridge Street, Suite 900
Boston, Massachusetts 02114

Re: Boston Logan International Airport 2022 Environmental Status and Planning Report - EEA #3247

Dear Secretary Tepper and Director Kim:

On behalf of the Massachusetts Port Authority (Massport), we are pleased to submit this *2022 Environmental Status and Planning Report* (ESPR) for Boston Logan International Airport (Logan Airport or the Airport). This filing continues Massport's four-decade practice of providing an extensive record of Logan Airport's environmental trends, facility planning, operations and passenger data, and Massport's mitigation commitments. This ESPR focuses on current operational and environmental conditions at the Airport and future conditions forecasted over the next 10 to 15 years.

The ESPR document is produced by Massport every five years, but ESPR publications are interspersed with annual Environmental Data Reports (EDRs), which focus on year-over-year conditions and trends. The Logan Airport ESPR is a unique document within the Massachusetts Environmental Policy Act (MEPA) process, as Massport is the only state agency that prepares such a document. Notably, unlike other MEPA filings, ESPRs and EDRs are not "projects" within the typical MEPA framework. These documents do not replace individual project filings subject to MEPA, nor do they serve as approval for a specific project or activity. Rather, the ESPR and EDR series are critical tools for Massport as they provide current and historical context for evaluating individual projects at Logan Airport that meet state and federal environmental review thresholds, as well as context for understanding the cumulative environmental effects of Logan Airport's operations and activities.

In 2022, Logan Airport continued to progress towards a recovery to pre-pandemic passengers and aircraft operations activity levels, but passenger activity still remained 15 percent less than 2019 levels and aircraft operations were 11 percent less than 2019. Although long-term recovery depends on business and international travel returning, Logan Airport continues to be an integral part of the regional transportation system, supporting connections to small regional airports in addition to providing an essential link between rail, port, and ground transportation networks.

Logan Airport operations were adjusted or reduced by airlines and tenants in response to pandemic impacts, which led to the temporary modification or deferment of several Airport projects and programs. In 2022, Massport was able to restart several deferred projects and programs, and Massport will continue to plan and prepare for the full recovery of aircraft operations and passenger activity.

Logan Airport is focusing on reducing emissions from its operations through fleet and ground service equipment (GSE) conversion to electric or other renewable fuels and by promoting high-occupancy vehicle (HOV) use. Logan Airport continues to be a leading U.S. airport in promoting HOV usage. The

Airport has exceeded Massport's targets for percent HOV mode share and remains on track to meet future goals. Key initiatives implemented in 2022, or planned for the immediate future, to improve ground access to the Airport include expanding Logan Express service, purchasing replacement Massachusetts Bay Transportation Authority Silver Line buses, and continuing RideApp Management Plan implementation.

Decreased operations in 2022, including reductions in nighttime operations and a shift towards newer, quieter engine types, reduced the percentage of the population exposed to substantial Airport noise. Efforts are also underway with the Federal Aviation Administration and Massachusetts Institute of Technology to reduce noise by changing navigation procedures and flight performance modifications. Massport also re-initiated the residential sound insulation program for FAA eligible residences after the FAA changed its qualification criteria for homes already insulated before 1993.

As part of its ongoing strategic planning efforts, Massport prepares future forecasts of aircraft operations and passenger activity over a forecasting timeframe of the next 10 to 15 years for each ESPR, which is referred to as the Future Planning Horizon. The *2022 ESPR* evaluates operational and environmental conditions associated with the anticipated 53.5 million annual air passengers and 495,000 annual aircraft operations projected to occur within the *2022 ESPR* Future Planning Horizon, which also aligns with the trends projected in the *2017 ESPR*.

The Future Planning Horizon activity forecasts were used to analyze future air quality, ground access, and noise conditions. Analysis results showed future noise, air emissions, and vehicular traffic density at the Airport will increase in the future and likely exceed 2019 and 2022 conditions but will still remain well below historic highs and well below EPA NAAQS standards for criteria pollutants. In addition, planning initiatives such as roadway and garage facility enhancements, increased sound insulation, and Massport's *Roadmap to Net Zero* (Net Zero by 2031) in addition to existing mitigation strategies will reduce adverse effects associated with over the Future Planning Horizon.

In response to new MEPA policies, stakeholder engagement, and ongoing coordination with MEPA, the 2022 ESPR includes the new Chapter 2, *Sustainability, Outreach, and Environmental Justice*, which covers:

- **Climate Adaptation and Resiliency** – In 2022, Massport published its *Roadmap to Net Zero by 2031*, an ambitious, Authority-wide program to achieve net zero GHG emissions by 2031 for the activities under Massport's control. Chapter 2 discusses the Net Zero by 2031 program as well as other sustainability and resiliency measures undertaken at Logan Airport that demonstrate Massport's commitment to being an environmental steward and leader in both the region and aviation industry.
- **Community Involvement and Environmental Initiatives** – Massport strives to be a good neighbor to the surrounding community through its development of parks and open space, charitable giving and funding local foundations aimed at improving community quality of life. Massport continues to develop initiatives to respond to cumulative environmental impacts from Airport operations, separate from project-specific mitigation commitments.

- **Massport's Outreach** – Massport's Community Relations & Government Affairs Department manages relationships with community members, local organizations, and government officials, with a focus on engaging Environmental Justice (EJ) communities. For this and future reports, Massport will expand EJ outreach through translation services for populations within a 5-mile radius of Logan Airport and Massport Community Advisory Committee communities.
- **Environmental Justice and Public Health** – Located in an urban center, Massport recognizes Logan Airport is proximal to EJ communities. Massport has conducted an existing conditions review in this ESPR to characterize EJ block groups and public health within 1-mile of the Airport.

ESPR Content and Structure

The *2022 ESPR* responds to the Secretary's Certificate on the *Boston Logan International Airport 2020/2021 EDR*, dated January 2023. The ESPR provides updated conditions for the following topics:

- Passenger levels, aircraft operations, aircraft fleets, and cargo volumes;
- Planning, design, and construction activities at Logan Airport;
- Sustainability initiatives;
- Regional transportation statistics and initiatives;
- Key environmental indicators, including ground access, noise, air quality and GHG emissions, and water quality; and
- Status of Logan Airport project mitigation

The *2022 ESPR* includes the Secretary's Certificate on the *Boston Logan International Airport 2020/2021 EDR* and associated comment letters. Certificates received on the Logan Airport Parking Project (EEA# 15665) and Terminal E Modernization Project (EEA# 15434), which included items to be addressed in future EDRs and ESPRs, are also provided. Supporting technical appendices are available electronically.

In response to comments on the *2020/2021 EDR*, we have reevaluated the contents of chapters to streamline the narrative to focus on 2022 updates on existing initiatives, new programs and planning, and future forecast outcomes. In addition, the document has been made more accessible through an added glossary, improved navigation, and bookmarking within the electronic version.

Review Period, Distribution, and Consultation

As we have done in the past, Massport is requesting an extended public comment period for this ESPR. Based on this request, the public comment period will begin on June 7, 2024, the publication date of the next MEPA *Environmental Monitor*, and will end on August 6, 2024. The *2022 ESPR* distribution list, included as Appendix D, *Distribution*, indicates which listed parties will receive an electronic copy of this ESPR, a printed copy, or a notice of availability.

As with other Massport environmental filings, this ESPR is presented in its entirety on Massport's website (https://www.massport.com/environment/project-environmental-filings/boston-logan). Additional hard copies of the *2022 ESPR* may also be provided upon request.

A public consultation session on the *2022 ESPR* will be held on June 26, 2024. Meeting details will be available in the *Environmental Monitor*, posted on Massport's website, and emailed to the distribution list.

We look forward to your review of this document and consultation with the MEPA Office and other reviewers. Please feel free to contact me at (617) 568-3546 or bwashburn@massport.com with any questions.

Sincerely,

Massachusetts Port Authority

Brad Washburn
Deputy Director, Environmental Planning & Permitting

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

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Appendix B, **Comment Letters and Responses to Comments**

Appendix C **Proposed Scope for the 2023 EDR**

Appendix D **Distribution**

The following appendices include supporting documentation for above listed chapters and are available on Massport's website: (https://www.massport.com/environment/project-environmental-filings/boston-logan):

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Appendix F **Activity Levels Supporting Documentation**

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Acronyms

A	
AAD	Average Annual Day
AADT	Annual Average Daily Traffic
AC	Advisory Circular
ACA	Airport Carbon Accreditation
ACI-NA	Airports Council International – North America
ACRP	Airport Cooperative Research Program
ACS	U.S. Census American Community Survey
ADA	Americans with Disabilities Act
ADPM	Average Day of Peak Month
ADRM	Airport Development Reference Manual
AEDT	Aviation Environmental Design Tool
AFFF	Aqueous Film Forming Foam
AFS	Aircraft Fueling System
AFV	Alternative Fuel Vehicles
ALP	Airport Layout Plan
APM	Automated People Mover
APO	FAA Office of Aviation Policy and Plans
APU	Auxiliary Power Unit
APV	Approach Procedure with Vertical Guidance
ARFF	Aircraft Rescue and Firefighting
ARRA	American Recovery and Reinvestment Act
ASCENT	FAA Aviation Sustainability Center
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASPM	Aviation System Performance Metrics
AST	Aboveground Storage Tank
ATMS	Automated Traffic Monitoring System
AVI	Automated Vehicle Identification
AAWDT	Annual Average Weekday Daily Traffic
AWEDT	Annual Average Weekend Daily Traffic

B	
BC	Black Carbon
BDL	Bradley International Airport
BED	Hanscom Field
BGR	Bangor International Airport
BIF	Bird Island Flats
BLANS	Boston Logan Airport Noise Study
BMPs	Best Management Practices
BNRD	Bus Network Redesign
BPDA	Boston Planning and Development Agency
BRT	Bus Rapid Transit
BTD	Boston Transportation Department
BTV	Burlington International Airport

C	
CAA	Connecticut Airport Authority
CAC	Community Advisory Committee
CACI	Clean Air Construction Initiative
CAEP	Committee on Aviation Environmental Protection
CAGR	Compound Annual Growth Rate

CARES Act	Coronavirus Aid, Relief, And Economic Security Act
CAT	Central Artery and Tunnel
CATEX	Categorical Exclusion
CDC	U.S. Centers For Disease Control And Prevention
CEO	Chief Executive Officer
CFR	Code of Federal Regulations
CHP	Central Heating Plant
CIP	Capital Investment Program
CLF	Conservation Law Foundation
CMR	Code of Massachusetts Regulations
CNG	Compressed Natural Gas
CNI	Cumulative Noise Index
CO	Carbon Monoxide
CONEG	Conference of New England Governors
COPD	Chronic Obstructive Pulmonary Disease
CRISI Program	Consolidated Rail Infrastructure and Safety Improvements Program
CSC	Customer Service Center
CTDOT	Connecticut Department of Transportation
CTPS	Central Transportation Planning Staff
CWA	Clean Water Act
CY	Calendar Year
D	
dB	Decibels
dBA	A-Weighted Decibel
DC	Direct Current
DE&I	Diversity, Equity & Inclusion
DEIR	Draft Environmental Impact Report
DERA	Diesel Emissions Reduction Act
DFS	Department of Fire Services
DGA	Designated Geographic Area
DMF	Massachusetts Department Oo Marine Fisheries
DMP	Demand Management Program
DMRs	Discharge Monitoring Reports
DNL	Day Night Average Sound Level
DPH EJ Tool	Massachusetts Department of Public Health Environmental Justice Tool
E	
EA	Environmental Assessment
EAS	Essential Air Service
EDMS	Electronic Document Management System
EDR	Environmental Data Report
EEA	Massachusetts Executive Office Of Energy And Environmental Affairs
EENF	Expanded Environmental Notification Form
eGSE	Electric Ground Service Equipment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EJ	Environmental Justice
EMAS	Engineered Materials Arresting System
ENF	Environmental Notification Form
EPNL	Effective Perceived Noise Level
ESMF	Equipment Storage and Maintenance Facility
ESPR	Environmental Status And Planning Report
EV	Electric Vehicle
F	
FAA	Federal Aviation Administration

FAR	Federal Aviation Regulations
FBO	Fixed-Base Operator
FEIR	Final Environmental Impact Report
FIS	Federal Inspection Services
FONSI	Finding of No Significant Impact
FRA	Federal Railroad Administration
FSC	Forest Stewardship Council
FY	Fiscal Year
G	
GA	General Aviation
GBCI	Green Business Certification, Inc.
GDP	Gross Domestic Product
GEIR	Generic Environmental Impact Report
GHG	Greenhouse Gas
GIS	Geographic Information System
GPM	gallons per mile
GRP	Gross Regional Product
GSE	Ground Service Equipment
GTOC	Ground Transportation Operations Center
H	
HOV	High-Occupancy Vehicle
HVAC	Heating, Ventilation, And Air Conditioning
HVN	Tweed-New Haven Regional Airport
I	
IAQ	Indoor Air Quality
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
ILS	Instrument Landing System
INM	Integrated Noise Model
IPCC	Intergovernmental Panel on Climate Change
ISA	Inclined Safety Area
J	
JOC	Joint Operations Center
L	
LCC	Low-Cost Carriers
LED	Light Emitting Diode
LEED®	Leadership in Energy and Environmental Design
LIAG	Logan Impact Advisory Group
LOI	Letter of Interest
LTO	Landing and Takeoff
M	
MA	Massachusetts
MAP	Million Annual Passengers
MAPC	Metropolitan Area Planning Council
MassDEP	Massachusetts Department of Environmental Protection
MassDPH	Massachusetts Department of Health
MassDOT	Massachusetts Department of Transportation
Massport CAC	Massport Community Advisory Committee
MBTA	Massachusetts Bay Transportation Authority
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
MHT	Manchester-Boston Regional Airport
MIT	Massachusetts Institute of Technology

MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOVES	Motor Vehicle Emissions Simulator
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
MT	Metric Ton
MMT	Million Metric Tons
N	
NAAQS	National Ambient Air Quality Standards
NAVAID	Navigational Aids
NCA	North Cargo Area
NCI	Noise Complaint Initiative
NEA	Northeast Alliance
NEC	Northeast Corridor
NEG/ECP	New England Governors and Eastern Canadian Premiers
NEM	Noise Exposure Map
NEPA	National Environmental Policy Act
NERASP	New England Regional Airport System Plan
NERASP-GA	New England Regional Airport System Planning – General Aviation
NES	Neighborhood Environmental Survey
NNEIRI	Northern New England Intercity Rail Initiative
NOMS	Noise And Operations Monitoring System
NO_X	Nitrous Oxides
NPC	Notice of Project Change
NPDES	National Pollutant Discharge Elimination System
NPSI	Noise Per Seat Index
NSA	North Service Area

O	
OAG	Official Airline Guide
ORH	Worcester Regional Airport
P	
PAHs	Polycyclic Aromatic Hydrocarbons
PAL	Planning Activity Level
PARC	Parking And Revenue Control
PBN	Performance-Based Navigation
PCA	Pre-Conditioned Air
PFAS	Per- And Polyfluoroalkyl Substances
PM	Particulate Matter
PMO	Program Management Office
PPP	Peak Period Pricing
ppm	Parts Per Million
ppt	Parts Per Trillion
PRAS	Preferential Runway Advisory System
PSM	Portsmouth International Airport
PV	Photovoltaic
PVD	Rhode Island T.F. Green International Airport
PWM	Portland International Jetport
Q	
QTA	Quick Turnaround Areas
R	
RACT	Reasonable Available Control Technology
RCC	Rental Car Center
RFI	Request For Information
RFP	Request For Proposals
RFQ	Request For Quote
RIAC	Rhode Island Airport Corporation

RIDOT	Rhode Island Department of Transportation
RIM	Runway Incursion Mitigation
RJ	Regional Jet
RMP	Risk Management Plan
RNAV	Area Navigation
RNP	Required Navigational Performance
ROD	Record of Determination
RON	Remain Over Night
RPZ	Runway Protection Zone
RSA	Runway Safety Area
RSIP	Residential Sound Insulation Program
S	
SAF	Sustainable Aviation Fuel
SCA	South Cargo Area
SID	Standard Instrument Departures
SIP	Massachusetts State Implementation Plan
SMP	Sustainability Management Plan
SOV	Single-Occupancy Vehicle
SPCC	Spill Prevention Control and Countermeasure
STEM	Science, Technology, Engineering, and Math
SWPPP	Stormwater Pollution Prevention Plan
SWSA	Southwest Service Area
T	
TA	Time Above
TAA	Tenant Alteration Application
TAF	Terminal Area Forecast
TDM	Transportation Demand Management
TIM	Time in Mode
TIP	Transportation Improvement Program
TMA	Transportation Management Association
TRB	Transportation Research Board
TRI	Toxic Release Inventory
TSA	Transportation Security Administration
TSP	Transportation Security Program
TSS	Total Suspended Solids
U	
U.S.BLS	U.S. Bureau of Labor Statistics
U.S.DOT	U.S. Department of Transportation
U.S.EPA	U.S. Environmental Protection Agency
U.S.HUD	U.S. Department of Housing And Urban Development
U.S.GBC	U.S. Green Building Council
UFP	Ultrafine Particle
ULCC	Ultra-Low Cost Carriers
ULSD	Ultra Low Sulfur Diesel Fuel
U.S.ACE	Army Corps of Engineers
USTs	Underground Storage Tanks
V	
VALE	Voluntary Airport Low Emission
VMT	Vehicle Miles Traveled
VNM	Virtual Noise Monitors
VOC	Volatile Organic Compound
Z	
ZIAA	Zero Impact Aviation Alliance

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Key Terminology

Term (Acronym)	Definition
"A"-weighted decibel (dBA)	A noise metric that adjusts the Sound Pressure Level (SPL) to mimic human auditory sensitivity, which is less responsive to low and high frequencies and most sensitive to mid-range frequencies.
Aboveground Storage Tanks (AST)	Aboveground Storage Tanks (AST) at airports are storage containers located above the ground, used primarily for storing aviation fuel and other essential liquids, and their installation and management are typically overseen by environmental and aviation regulatory bodies.
Advisory Opinion	If the proponent has questions on the meaning or applicability of any provision or requirement of the Massachusetts Environmental Policy Act (MEPA), an Advisory Opinion may be requested from the MEPA office.
Air Passengers	Enplaned (arriving) and deplaned (departing) passengers.
Air taxi	Small commercial aircraft used for short flights between localities not served by scheduled airlines. May be on-demand service.
Aircraft Certification Noise Categories (Stages 1 through 5)	Stage 1 aircraft are the noisiest and Stage 5 aircraft are the quietest (as defined in the Code of Federal Regulations (CFR) Title 14 Part 36, Noise Standards: Aircraft Type and Airworthiness Certification).
Aircraft Noise and Performance Data (ANP data)	Noise-related data used in the AEDT model (version 3e) based on distance, altitude, speed, and engine power for 179 civilian aircraft, 84 military aircraft, and 26 helicopters.
Aircraft Operations	Arriving and departing aircraft movements, including takeoffs and landings.
Airside	Refers to the restricted area of an airport within access control that is accessible only to authorized personnel. This includes areas such as the runways, taxiways, apron, and the gates where aircraft are parked, loaded or unloaded, refueled, or boarded.
Alternative Fuel Vehicle (AFV)	AFVs are motor vehicles that operate on non-traditional fuels, such as electricity, biofuels, natural gas, or hydrogen, instead of conventional petroleum fuels, which reduces overall emissions and enhances environmental sustainability.
Annual Average Daily Traffic (AADT)	AADT is a measure of how much traffic the Airport experiences on an average day over the course of a year.
Annual Average Weekday Daily Traffic (AWDT)	AWDT is the average number of vehicles on Airport roadways on a typical weekday over the course of a year.

Term (Acronym)	Definition
Annual Average Weekend Daily Traffic (AWEDT)	AWEDT is the average number of vehicles on Airport roadways on a typical weekend day over the course of a year.
Automated Traffic Monitoring System (ATMS)	ATMS technology automatically collects, processes, and analyzes vehicle volume data, which helps Airport staff to better manage, understand, and control traffic flow.
Auxiliary Power Unit (APU)	A device that provides energy for functions other than propulsion, usually to power systems on an aircraft when the main engines are not running, such as during ground operations, pre-flight checks, and providing air conditioning for passengers.
Aviation Environmental Design Tool (AEDT)	The FAA's required computer model for assessing aircraft noise and emissions.
Belly Cargo	Cargo transported in the lower hold of a passenger aircraft.
Best Management Practices (BMPs)	BMPs, as defined under the CWA NPDES program, are engineered structures, procedures, or technologies used to manage, control, or prevent harmful pollutants from being carried by stormwater runoff into natural water bodies, thereby reducing the impact on the environment from stormwater runoff associated with industrial activities.
Building Envelope	All components of a building that enclose its internal spaces, such as walls, floors, roofs, windows, and doors.
Capacity/seat capacity	Number of passenger seats per aircraft or aggregated across all aircraft.
Carbon Offsets	Measurable, verifiable reductions in greenhouse gas (GHG) emissions that compensate for emissions produced elsewhere; typically achieved by either reducing the production of GHGs or by removing GHGs from the atmosphere.
Cargo Airlines	Airlines operating aircraft only for transportation of cargo without customer passengers onboard.
Categorical Exclusion (CATEX)	A federal action may be exempt, or "categorically excluded", from a detailed environmental analysis when the federal action normally does not have a significant effect on the human environment.

Term (Acronym)	Definition
Clean Water Act (CWA)	Originally enacted as the Federal Water Pollution Control Act in 1948, the Act was significantly reorganized and expanded in 1972, becoming commonly known as the Clean Water Act. This U.S. federal law, regulated by the U.S. Environmental Protection Agency (U.S. EPA), controls the discharge of pollutants into the nation's surface waters, including lakes, rivers, streams, wetlands, and coastal areas. The CWA established the basic structure for regulating pollutant discharges into the waters of the United States and gave the EPA the authority to implement pollution control programs such as setting wastewater standards for industry and the NPDES permit program.
Connecting Passengers	Passengers who arrive on one flight and subsequently take another flight to reach their final destination.
Co-permittee	A co-permittee under a stormwater NPDES permit refers to an entity that shares responsibility and liability with the primary permit holder for complying with the conditions of the permit. This can include managing BMPs, stormwater quality sampling or monitoring, and reporting spills of possible pollutants.
Criteria Air Pollutants	The group of main air pollutants that have been established by the US.EPA to cause harm to human health, the environment, or property. These pollutants are often generated from aircraft engines, ground support equipment, and vehicles, potentially affecting air quality in and around airport environments. The EPA criteria pollutants are carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), coarse particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb).
Cumulative Noise Index (CNI)	A single number representing the total noise energy from commercial jet takeoffs and landings for a full year. Like DNL, CNI incorporates a 10-decibel weighting for operations occurring at night.
Day Night Average Sound Level (DNL)	A 24-hour cumulative noise exposure measure that applies a 10-dB weighting to nighttime noise (10:00 PM to 7:00 AM) due to increased sensitivity. It is the FAA's preferred metric for assessing noise and land use compatibility.
Deadhead trips	Deadhead trips are trips where vehicles travel to or from the Airport without additional passengers other than the driver. For example, with for-pay transportation services like taxis, the driver may return to the Airport without a customer in the vehicle after dropping off passengers.

Term (Acronym)	Definition
Decibel (dB)	The standard unit for Sound Pressure Level (SPL), representing the logarithmic ratio between the pressure of a sound source and a reference pressure. SPL ranges from 0 dB for barely audible sounds to 120 dB for the loudest pain-free sounds, with most daily sounds falling between 30 to 100dB.
Derivative forecast	Detailed forecast that derives specific data regarding aircraft, destination pairs and other more fine-grained information.
Designated Geographic Area (DGA)	The area within one mile or five miles of the project area for projects subject to MEPA review. For the EDRs and ESPRs, as of 2020/2021 EDR Secretary's Certificate for the 2022 ESPR, the DGA is a 5-mile radius for outreach purposes.
Diversity, Equity, and Inclusion (DE&I)	Principles that promote a diverse workforce, ensure equal opportunities, and foster an inclusive environment. This involves strategies to ensure representation of different groups, based on race, gender, age, and other factors, in staffing, leadership, and decision-making processes.
Domestic Air Travel	Travel starting and ending within the U.S.
Draft Environmental Impact Report (DEIR)	A DEIR is a detailed report prepared by a project proponent, which assesses and documents the potential environmental impacts of a project or development. The report also proposes steps to mitigate the identified impacts. This report includes responses to comments received on the ENF. This draft report is then submitted to MEPA for review and approval.
Effective Perceived Noise Level (EPNL)	A metric calculated by using a series of "tone corrected" perceived noise levels, measured in EPNdB. This includes a "pure tone" correction of up to 6 dB. EPNdB is an international standard for aircraft noise certification and contributes to the calculation of Logan Airport CNI.
Effective Runway Use vs. Actual Runway Use	The Actual Runway Use is reported as annual percentages calculated from operations counts that occurred on each runway. In contrast, the Effective Runway Use calculation multiplies nighttime operations by 10 before determining percentages. Doing so allows direct comparison of runway use changes with DNL changes (because DNL calculations incorporate a 10-times nighttime weighting).
Electric Vehicle (EV)	An electric vehicle is a vehicle that is powered by electricity, often stored in a battery, instead of gasoline or other fuels.
Engineered Material Arresting System (EMAS)	An Engineered Material Arresting System uses crushable material placed at the end of a runway to help stop an aircraft that overruns or undershoots the runway.

Term (Acronym)	Definition
Environmental Assessment (EA)	An EA determines whether a federal action has the potential to cause significant environmental effects.
Environmental Data Report (EDR)	An EDR is a comprehensive document that compiles all the relevant environmental information and details about a specific geographical area or a proposed project site. This information may include data related to weather conditions, soil composition, water quality, air quality, existing vegetation and wildlife, historical and cultural resources, and any noted hazards or contamination. This report aids the decision-makers to understand the project's potential environmental impact and to develop appropriate mitigation strategies. Logan Airport EDRs are issued annually except for years that ESPRs are issued. Logan Airport the only entity in the state for which EDRs are prepared.
Environmental Impact Statement (EIS)	An EIS is prepared when one or more environmental impacts of a Proposed Action would be significant and mitigation measures would not reduce the impact(s) below significant levels.
Environmental Justice (EJ)	Massport utilizes the Massachusetts Energy and Environmental Affair's (EEA) and Massachusetts Environmental Policy Act Office's (MEPA) definition of environmental justice (EJ) communities: "EJ populations are those segments of the population that EEA has determined to be most at risk of being unaware of or unable to participate in environmental decision-making or to gain access to state environmental resources or are especially vulnerable. They are defined as neighborhoods (U.S. Census Bureau census block group data for minority criteria, and American Community Survey (ACS) data for state median income and English isolation criteria) that meet one or more of the following criteria: • The annual median household income is not more than 65 percent of the statewide annual median household income; • Minorities comprise 40 percent or more of the population; • 25 percent or more of households lack English language proficiency; or • Minorities comprise 25 percent or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income."
Environmental Notification Form (ENF)	The MEPA review of a project is initiated through the preparation and filing of an Environmental Notification Form.

Term (Acronym)	Definition
Environmental Status and Planning Reports (ESPRs)	ESPRs are comprehensive documents that elaborate on the current environmental conditions of a certain location or area, and provide insights into the planning considerations for future developmental or construction activities. These reports are particularly significant for urban planning, infrastructure projects, or any construction activity that could potentially impact the environment. Logan Airport ESPRs are issued every five years. Logan Airport and Hanscom Field are the only entities in the state for which ESPRs are prepared.
Executive Office of Energy and Environmental Affairs (EEA)	The Massachusetts Executive Office of Energy and Environmental Affairs (EEA) is a governmental department that oversees the conservation, regulation and utilization of the state's environmental resources, along with developing and implementing the state's energy policies. EEA manages the enforcement of MEPA.EEA mandates the Section 61 mitigation measures for those projects that have been determined through MEPA review to cause impacts to the environment, requiring proponents to implement avoidance, minimization, and mitigation strategies.
Final Environmental Impact Report (FEIR)	An FEIR is a comprehensive report that provides final details on a project's potential environmental impacts, following the Draft Environmental Impact Report (DEIR). This report includes responses to comments received on the DEIR, completes the analysis of environmental impacts, and outlines final commitments to mitigate identified impacts. This final report is submitted to the Massachusetts Environmental Policy Act Office for a final review and decision on the project.
Finding of No Significant Impact (FONSI)	If the Federal agency determines that the action will not have significant environmental impacts, the agency will issue a Finding of No Significant Impact.
Fixed-base operator (FBO)	A business that operates on an airport (separate from the commercial terminal) providing aeronautical services such as fuel, parking, and hangar space.
Future Planning Horizon	The future period of time over which aviation demand and capacity needs are projected, which was established for this ESPR as 10 to 15 years from 2022
Gateway Roadways	These are the roads, streets, and other surface transportation infrastructure that serve as access points to enter and exit from Logan Airport.

Term (Acronym)	Definition
General aviation (GA)	A public-use airport that does not have scheduled service or has scheduled service with fewer than 2,500 passengers each year. Includes aviation activities that are not military, commercial cargo, or commercial passenger travel based, including private flying, flight training, business flights, and emergency services.
General Aviation vs. Commercial Aviation	Commercial Aviation includes scheduled passenger flights for the general public by major carriers like Delta Airlines and Low-cost carriers such as jetBlue as well as cargo flights, such as FedEx. General Aviation comprises all other flights, such as private jets or personal aircraft.
Grab Samples	Single samples of liquid discharges from stormwater outfalls collected from outfall-specific locations during low tide.
Greenhouse gasses (GHG)	Gases in Earth's atmosphere trap heat, contributing to the greenhouse effect and global climate change, and include carbon dioxide, methane, nitrous oxide, and fluorinated gases. These gases are reported in the unit metric tons of carbon dioxide equivalent (MTCO2e). The scopes of GHGs typically refer to the different sources of emissions: Scope 1 covers direct emissions from Massport-owned sources, Scope 2 includes indirect emissions from purchased electricity, heating, and cooling, while Scope 3 covers all other indirect emissions.
Gross Domestic Product (GDP)	A measure of economic output for the U.S.
Gross Regional Product (GRP)	A measure of economic output for a region within the U.S.
Ground Service Equipment (GSE)	The various vehicles and tools used on the ground at airports to support aircraft operations, such as tugs, tractors, loaders, refuelers, and catering and cleaning vehicles.
Headway	Headway refers to the time interval between vehicles, such as buses or shuttles, on a particular route. This reflects the maximum passenger wait time for a vehicle to arrive.
Large Hub	1 percent or more of annual commercial enplanements in the U.S.
Medium Hub	0.25 to 1 percent of annual commercial enplanements in the U.S.
Small Hub	0.05 to 0.25 percent of annual commercial enplanements in the U.S.
Instrument Landing System (ILS)	The ILS provides pilots with electronic guidance for aircraft alignment, descent gradient, and position for landing safely under conditions of reduced ceilings and visibility. An ILS uses a signal path from the localizer (LOC) antenna, and glide Slope (GS) antenna to provide horizontal and vertical guidance to pilots.
International Air Travel	Travel to and from locations outside the U.S.

Term (Acronym)	Definition
Large Jet Aircraft	Jet aircraft with 100 seats or more.
Leadership in Energy and Environmental Design (LEED®)	LEED® administered by the U.S Green Building Council. provides a framework for healthy, efficient, and cost-saving green buildings. LEED® certification is a globally recognized symbol of sustainability achievement and leadership. LEED Certification is an independent certification that is verified by a third party.
Load Factor	Percentage of passengers compared to available aircraft seats per flight.
Logan Airport Parking Freeze	The Logan Airport Parking Freeze is a regulatory measure, which is an element of the *Massachusetts State Implementation Plan*, which sets a limit on the number of commercial and employee parking spaces allowed at Logan Airport. In accordance with 310 CMR 7.30 Massport regularly reports on compliance, not allowing the total parked vehicles to exceed the parking freeze limits, with special provisions for "Restricted Use Parking Spaces" in scenarios of high demand.
Low-cost carrier (LCC)	Airline offering middle-of-the-pack fares between the most budget-friendly carriers and full-service legacy carriers. Usually operates a few aircraft types and has a large, but not comprehensive, route network. Focuses more on point-to-point flying than on connections through hubs.
Massachusetts Bay Transportation Authority (MBTA)	As a division of the Massachusetts Department of Transportation (MassDOT), the MBTA provides subway, bus, Commuter Rail, ferry, and paratransit service to eastern Massachusetts and parts of Rhode Island.
Massachusetts Contingency Plan (MCP)	The MCP is a set of regulations governed by the Massachusetts Department of Environmental Protection (MassDEP) that controls the reporting, assessment, and cleanup of oil and hazardous material spills. It prescribes the site cleanup process based on the nature and extent of a release's contamination.

Term (Acronym)	Definition
Massachusetts Environmental Policy Act (MEPA)	A state law that requires all state agencies to study the environmental impacts of their projects before they are approved. The MEPA review process typically begins with the submission of an Environmental Notification Form (ENF) to the MEPA office, which provides a preliminary description of the project and its potential environmental impacts. If the project is deemed to have significant environmental impacts, the proponent must then prepare an Environmental Impact Report (EIR) that provides a more detailed analysis. The Secretary of Energy and Environmental Affairs (EEA) then issues a Secretary's Certificate, which determines whether the EIR adequately and properly complies with MEPA and whether any further steps are required. The EDR/ESPR evolved from a Generic EIR (GEIR) to a comprehensive planning document subject to MEPA review, including a Secretary’s Certificate for the next iteration.
MEPA Review	MEPA review is required if there it has jurisdiction over the project and the project meets or exceeds a MEPA review threshold (outlined at 301 CMR 11.03). MEPA review is not a permitting process. MEPA requires public study, disclosure, and development of feasible mitigation for a proposed project . It does not pass judgement on whether a project is environmentally beneficial, or whether a project can or should receive a particular permit. Those decisions are left to the permitting agencies. MEPA review occurs before permitting agencies act, to ensure that they are fully cognizant of environmental consequences of their actions.
Metropolitan Statistical Area (MSA)	U.S. government designation of the relevant geographic area with significant economic effects on a high population density.
Motor Vehicle Emission Simulator (MOVES)	A computer-based tool developed by the EPA for estimating emissions from ground support equipment, auxiliary power units in aircraft, and from vehicles on airport roads.
Narrowbody Aircraft	Single-aisle aircraft, typically with seating capacity of 100-200 seats.
National Ambient Air Quality Standards (NAAQS)	Established by the EPA to limit the concentrations of major air pollutants in outdoor air, with the objective of protecting public health or welfare. If an established area meets and surpasses these standards, it is described as being "in attainment."

Term (Acronym)	Definition
National Environmental Policy Act (NEPA)	A federal law that requires federal agencies, such as the Federal Aviation Administration (FAA), to assess the environmental effects of their proposed actions prior to making decisions. The process often begins with the preparation of an Environmental Assessment (EA), which is a concise document that provides sufficient evidence and analysis for determining the environmental impact of a proposed action. If the EA determines that the environmental impact is not significant, a Finding of No Significant Impact (FONSI) is issued by the FAA, which is a document presenting the reasons why an action will not have a significant effect on the human environment.
National Pollutant Discharge Elimination System (NPDES)	NPDES is a permit program regulated by the EPA that controls the discharge of pollutants from point sources to waters of the United States. The NPDES permit process involves the evaluation of the type and quantity of pollutants being discharged, the implementation of control measures to reduce pollutant discharge, and regular monitoring and reporting of discharge data to the EPA. NPDES permits are typically reviewed and renewed every five years to ensure ongoing compliance with the water quality standards of the Clean Water Act.
Navigational Aids (NAVAIDs)	A physical device on an airfield that provides navigational data to aircraft.
Net Zero Emissions (Net Zero)	When GHG emissions released to the atmosphere equal those sequestered or removed from the atmosphere. A Net Zero policy often refers strategies to decrease GHG emissions by increasing operating efficiencies, implementing technologies that reduce overall emissions, or offsetting emissions at other locations.
Network Airlines	Large, full-service airlines that operate comprehensive national and global route networks, utilizing connecting hubs and regional affiliate airlines. Also referred to as "traditional carriers" or "legacy carriers"
Noise and Operations Monitoring System (NOMS)	Massport's NOMS includes aircraft operations and flight tracking software as well as 30 permanent noise monitors installed throughout the surrounding communities.
Noise Contour	Lines connecting points of equal noise exposure on a map, much like topographic map contours connect points of equal elevation. This ESPR includes DNL contour maps to describe noise exposure geographically.
Noise Exposure Map	Official map documenting noise exposure for the 65 DNL contour.
Non-hub	More than 10,000, but fewer than 0.05 percent of annual commercial enplanements in the U.S.

Term (Acronym)	Definition
Non-jet Aircraft	Turboprop and piston aircraft without jet engines.
Notice of project change	Request to MEPA Office should a project materially change during the environmental review process.
Origin and Destination (O&D)	Local demand for passengers to start and end their journey at the same airport or within the same market.
Origin and Destination (O&D) Passengers	Passengers who begin or end their air journey at the airport, as compared to connecting passengers
Outfalls and Discharges	Outfalls refer to the points where stormwater, often from runways and other impermeable surfaces, is discharged into the environment, whether into surface water bodies or the ground, under regulatory oversight to manage pollution.
Passenger Airlines	Commercial airlines providing scheduled and non-scheduled passenger service; not including General Aviation
Passenger count	Annual measure of departing, arriving, and transiting (connecting) passengers at an airport. Includes commercial airline and general aviation passengers.
Per Capita Income (PCI)	Total earned income for a given geographic region divided by population count of that region.
Planning Activity Level (PAL)	The forecasted passenger activity over the Future Planning Horizon timeframe.
Preferential Runway Advisory System (PRAS)	Massport developed PRAS in 1982 in an effort to equitably distribute Logan Airport's noise impacts on surrounding communities. Although no longer in effect, elements of the system continue to inform Massport about noise distribution.
Record of Decision (ROD)	A Record of Decision is issued prior to an action to explain why NEPA approved or did not approve a Proposed Action. The ROD explains what the airport sponsor proposes to do and why, identifies actions the FAA and other Federal agencies must take, explains the alternatives analyzed and which one is environmentally preferred, and identifies required mitigation measures.
Regional Jet (RJ) Aircraft	Smaller jet aircraft, typically with less than 100 seats per plan, commonly used for shorter distance regional flights.
Reliever airport	Airports designated by the FAA to 1) relieve congestion at nearby commercial airports and 2) improve general aviation access to the community.
Rematch	Rematch allows ride app drivers who are dropping off passengers to locate, connect to, and pick up another passenger quickly and efficiently, which reduces or eliminates the need to circle the Airport or to leave without a passenger.

Term (Acronym)	Definition
Resiliency	ISI defines resiliency as the ability to successfully adapt to a significant disruption or impact as well as the ability to recover readily, even if adapting to prevent an impact was not possible.
RideApp	Formerly referred to as Transportation Network Companies (TNC), RideApp companies use online platforms to connect passengers with drivers who use their personal vehicles. Examples include Uber™ and Lyft™.
Runway Incursion Mitigation (RIM) Study	A comprehensive analysis conducted by airports to identify, prioritize, and develop strategies to reduce the risk of runway incursions. Runway incursions occur when an unauthorized aircraft, vehicle, or person enters the Airport's designated area for aircraft landings or takeoffs. The RIM study aims to enhance runway safety by addressing risk factors such as unclear taxiway markings, airport signage, and complex runway or taxiway layouts. A RIM Study was conducted at Logan Airport from 2016 to 2019.
Runway Safety Area (RSA)	A defined area surrounding the runway consisting of a prepared surface suitable for reducing the risk of damage to aircraft in the event of an undershoot, overshoot, or excursion from the runway.
Section 61 Findings and Mitigation Commitments	Massachusetts General Law Chapter 30, Section 61 authorizes state agencies with permitting responsibilities to make an official determination regarding potential impacts from a proposed project and whether impacts have been avoided, minimized, and mitigated for, as appropriate. Massport prepares Section 61 Findings for projects that are subject to MEPA that requires state permits.
Spill Prevention Control and Countermeasure (SPCC) Plan	A SPCC Plan is required by the EPA for facilities, such as the Airport, that store, handle, or use oil. It outlines how the facility, will prevent oil spills and manage any spills that do occur.
Stormwater Pollution Prevention Plan (SWPPP)	A SWPPP is a plan regulated by the EPA that outlines measures to prevent stormwater contamination from pollutants at the Airport. It includes practices to reduce pollutants in stormwater discharges and to ensure compliance with the terms of the NPDES permits.
Sustainability	The Institute for Sustainable Infrastructure (ISI) defines sustainability as a set of environmental, economic, and social conditions in which all of society has the capacity and opportunity to maintain and improve its quality of life indefinitely without degrading the quantity, quality, or availability of natural resources and ecosystems. Airports Council International - North America's definition expands on ISI's definition by putting an emphasis on holistic approach to managing assets to promote economic viability, operational efficiency, natural resource conservation, and social responsibility.

Term (Acronym)	Definition
Tenant Alteration Application (TAA)	The Tenant Alteration Application is an internal Massport process for tenants who want to make modifications to their leasehold.
Terminal Area Forecast (TAF)	Federal Aviation Administration (FAA) annual forecast estimate of aviation activity projections, including passenger enplanements, operations, and cargo volumes, for U.S. commercial airports.
Time Above (TA)	A metric indicating the total minutes that sound levels, typically from aircraft, exceed a specified threshold (e.g., "TA65" for 65 dB). While often used for a 24-hour average annual day, it can represent any time period, and any threshold can be used.
Ultra-low-cost carrier (ULCC)	Airlines offering the most budget-friendly fares. Usually operates one aircraft family and has a network connecting smaller cities and towns to popular leisure destinations. Generally, operates fewer frequencies at less convenient times than more expensive carriers. Historically called a “no frills” airline – all amenities are an extra charge.
Underground Storage Tanks (UST)	Underground Storage Tanks (UST) at airports are storage systems located below the ground surface, primarily used for storing various liquids such as aviation fuel, and their operation and maintenance are closely regulated by environmental and aviation regulatory agencies.
Unscheduled	Services, such as shuttle vehicles, which operate on an as-needed basis.
Upgauging	Introducing larger aircraft with greater capacity on existing frequencies to accommodate demand, typically on routes previously using regional jet aircraft.
Vehicle Miles Travelled (VMT)	VMT is the total number of miles driven by all vehicles within the Airport over an established timeframe.
Widebody Aircraft	Dual-aisle aircraft, typically with more than 200 seats per plane
Year-over-year (YoY)	Changes over the same period in the previous year.

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1. Introduction and Executive Summary

The Massachusetts Port Authority (Massport or the Authority) has provided an extensive record of Boston Logan International Airport's (Logan Airport or Airport) environmental trends, facility planning, aircraft operations, and passenger activity levels for four decades as well as climate mitigation commitments, in this *Boston Logan International Airport 2022 Environmental Status and Planning Report* (*2022 ESPR*).

1.1 Logan Airport Context

Massport owns and operates Logan Airport, a crucial hub in Boston as well as New England's passenger and cargo transportation networks. As the primary airport for the Boston metropolitan area, Logan Airport serves as the main New England airport for long distance services and as a significant international gateway for transatlantic services. Located less than three miles from downtown Boston, the Airport spans about 2,400 acres in East Boston and Winthrop, including 700 acres in Boston Harbor. Logan Airport's airfield comprises 6 runways, approximately 15 miles of taxiway, and about 240 acres of concrete and asphalt apron. The Airport has four interconnected passenger terminals, Terminals A, B, C, and E, each equipped with ticketing, baggage claim, and ground transportation facilities. Public transit lines, several direct bus lines, and a well-connected roadway system provide access to and from the Airport. Massport also offers Logan Express bus service for **air passengers** and employees from various park-and-ride lots in the metropolitan area. Logan Airport and its surroundings are illustrated in **Figure 1-1** and **Figure 1-2** for context.

For a translated version of this *Introduction and Executive Summary*, printed translations are available at each of the public libraries listed in Appendix D, and electronic translated versions are available on Massport's website. https://www.massport.com/environment/project-environmental-filings/boston-logan

Other language translations are available upon request. Please contact:
(617) 568 3546 or
community@massport.com.

Figure 1-1 Logan Airport Landscape Setting

2022 Environmental Status and Planning Report

Terminal Buildings
Service Areas
Parking Facilities

0 900 1,800 Feet

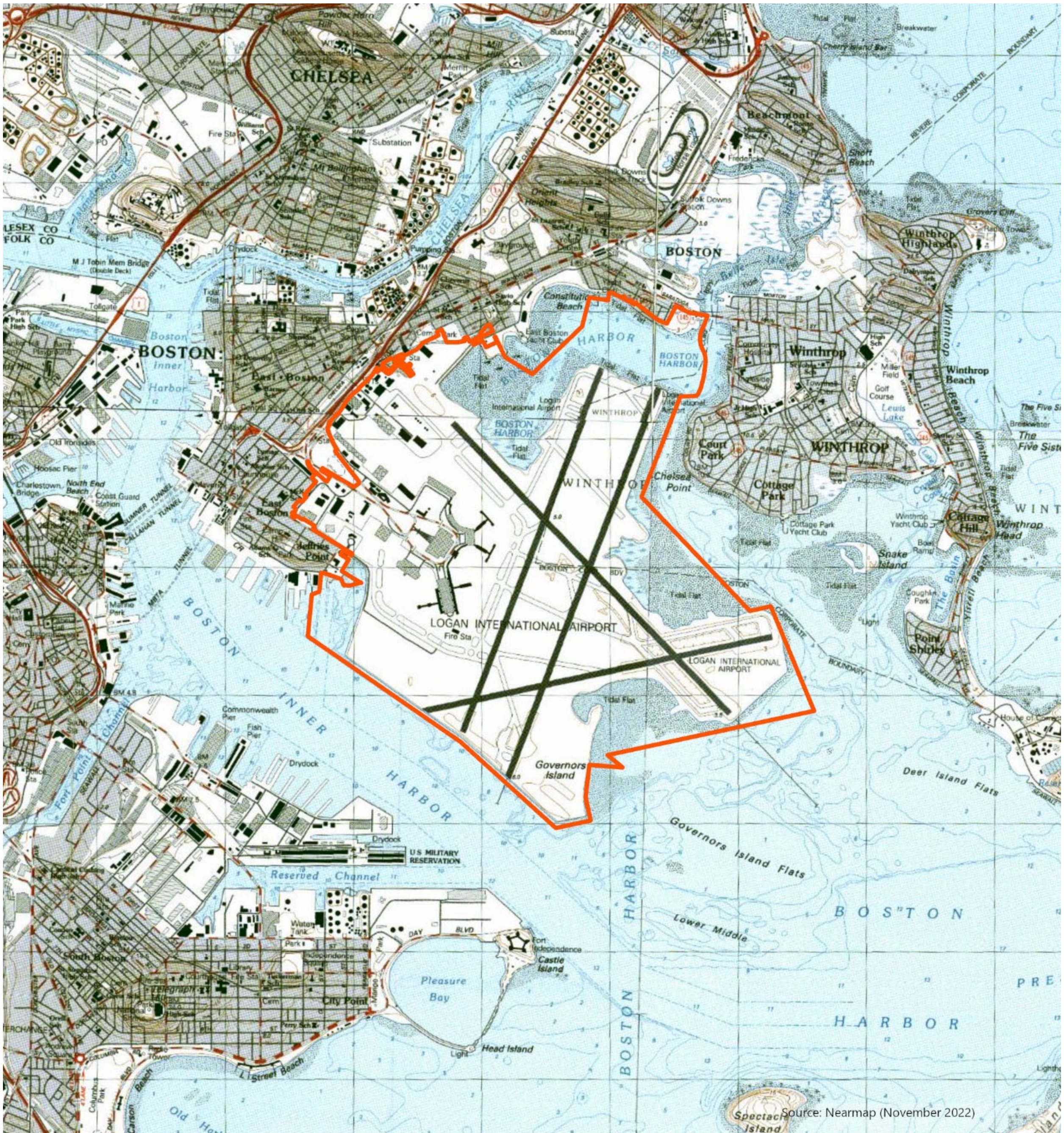


Figure 1-2 Logan Airport Context

2022 Environmental Status and Planning Report

Logan Airport Boundary

0 1,800 3,600 Feet

1.1.1 Activity Levels

This *2022 ESPR* reports on changes due to the COVID-19 pandemic at Logan Airport and within the aviation industry. In 2022, passengers totaled over 36 million with 378,613 flight operations. At the end of 2022, total flight operations and passengers were 15 percent less than 2019 levels before COVID-19. Long-term recovery at Logan Airport will depend largely on business and international travel as **domestic travel** across the U.S. has almost fully returned to pre-COVID activity levels.

In 2020 and 2021, the pandemic caused a significant reduction in Airport activity and revenues, which drove Massport, airlines, and other tenants to adjust and scale back their operations. Consequently, several Airport projects and programs were temporarily deferred until conditions normalized. Chapter 4, *Airport Planning*, provides project updates through December 2022, and includes projects moving forward in 2023. Future **Environmental Data Reports (EDRs)** and ESPRs will continue to provide updates, as available. Massport is continuously evaluating and planning for the full recovery of **aircraft operations** and air passenger activity and remains committed to implementing a broad range of environmental and operational measures designed to reduce impacts associated with Airport operations.

1.1.2 Future Planning Horizon

As part of its on-going strategic planning efforts, Massport routinely prepares future forecasts for aircraft operations and passenger activity levels. This *2022 ESPR* evaluates future operational and environmental conditions associated with the anticipated 53.5 million annual air passengers and 495,000 annual aircraft operations projected to occur over the next 10 to 15 years, which is the forecasting timeframe referred to as the **Future Planning Horizon**. Massport's forecast methodology is consistent with the Federal Aviation Administration's (FAA's) **Terminal Area Forecast (TAF)**. More information on the FAA's TAF is available in Chapter 3, *Activity Levels and Forecasting*, Section 3.5.

1.1.3 Massport Investment in Logan Airport

Massport continues to enhance Logan Airport's safety, security, operational efficiency, and accessibility while monitoring the environmental effects of its activities. Recent and on-going terminal area projects aim to provide seamless post-security connectivity between the terminals and improve passengers' travel experience through consolidated security checkpoint areas. Massport also prioritizes access to and around Logan Airport and works with the FAA to enhance **airside** safety by improving the **Runway Safety Area (RSA)** and simplifying airfield geometry.[1]

In addition, Massport has made a **net zero** greenhouse gas emissions (GHG) commitment for 2031, the *Roadmap to Net Zero by 2031* (Net Zero by 2031). More on Massport's net zero programming efforts are included in Chapter 2, *Sustainability, Outreach, and Environmental Justice,* Section 2.1.1.

1 Airfield geometry refers to the dimensions, orientation, condition, and number of runways on an airport's campus.

In response to the COVID-19 pandemic, Massport temporarily adjusted services to match shifting passenger demand and to better manage environmental and operational impacts. However, Massport remains committed to implementing project-related mitigation strategies, as documented in Chapter 10, *Project Mitigation*.

1.2 ESPR and EDR Purpose

The *2022 ESPR* is part of an annual series of environmental review documents Massport submits to the Secretary of the **Executive Office of Energy and Environmental Affairs (EEA)**, in accordance with the **Massachusetts Environmental Policy Act (MEPA)**.[2] The *2022 ESPR* continues Massport's established state-level environmental review process, which assesses the cumulative environmental impacts of activities associated with Logan Airport. These documents provide the current and historical context for individual projects at Logan Airport that meet state and federal environmental review thresholds as well as the cumulative environmental effects of Logan Airport's operations and activities. Massport has published these documents since 1979, making it a national leader in environmental reporting.

Approximately every five years, Massport prepares an ESPR to provide a historical and prospective view of Logan Airport's activities. For the years between ESPRs, Massport prepares EDRs annually. This *2022 ESPR* follows the *2020/2021 EDR*, and reports on 2022 activities and anticipated future conditions over the Future Planning Horizon.

Following the EEA's review of the *2020/2021 EDR*, Massport was directed to prepare this *2022 ESPR* according to a scope established by the Secretary's Certificate on the *2020/2021 EDR* dated January 30, 2023. The Certificate is included in Appendix A, *MEPA Certificates and Responses to Comments*. This ESPR fulfills the requirements outlined in the Secretary's Certificate on the *2020/2021 EDR* and responds to the comments within the Secretary's Certificate and as well as those submitted by other commenters. This report also presents historical data on the environmental conditions at Logan Airport dating back to 1990, where available, and includes updates through December 31, 2022. A Spanish translation of this chapter is included after the English version of the Executive Summary. Translations of the Executive Summary into Haitian Creole, Simplified Chinese, and Portuguese are available at libraries noted in Appendix D, *Distribution List* and on Massport's website https://www.massport.com/environment/project-environmental-filings/boston-logan. To request

This *2022 ESPR* provides updates on the following topics:

- Community Outreach, Environmental Justice, and Community Benefits
- Environmental Initiatives, Sustainability, and Resiliency
- Activity Levels
- Airport Planning
- Logan Airport's Regional Transportation Network Role
- Airport Ground Access
- Air Quality and Emissions
- Water Quality and Environmental Compliance
- Project-Specific Mitigation Efforts

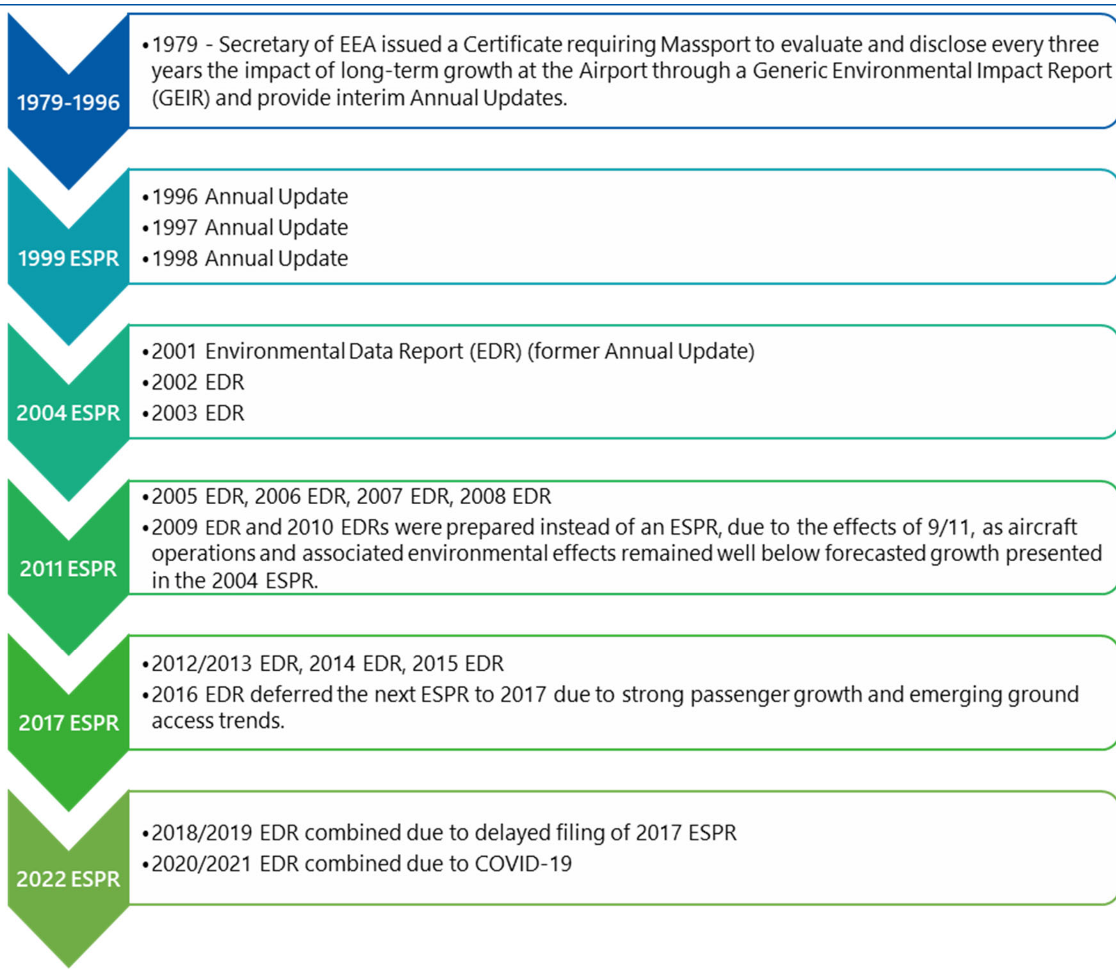
2 Massachusetts General Laws Chapter 30, Sections 61-62H. MEPA is implemented by regulations published at 301 Code of Massachusetts Regulations (CMR) 11.00 ("the MEPA Regulations").

additional translation services, please contact Brad Washburn, Massport, by phone at (617) 568-3546 or by email at community@massport.com.

1.2.1 Historical Context for the Logan Airport EDR and ESPR Reporting Process

Figure 1-3 shows the historical annual environmental reporting for Logan Airport, starting in 1979. These documents initially reported on the current environmental conditions and future forecasts at the Airport to the EEA and the public annually through the issuance of *Generic Environmental Impact Reports* (GEIR) every five years, and Annual Updates in the interim years. In the early 2000s, in response to guidance from EEA, these documents transitioned into an ESPR issued every five years with interim annual updates provided as EDRs. Over time, these reports have evolved into an effective planning tool for Massport, providing projections of environmental conditions to evaluate the overall effects of individual projects.

Figure 1-3 Historic ESPRs and Reporting Cycles



1.2.2 Project-Specific Reviews

Massport's ESPR is a unique document within the MEPA process. Unlike other MEPA documents, ESPRs and the annual EDRs are not "projects" within the typical MEPA framework. The documents do not take the place of any individual project filings subject to MEPA, nor do they serve as approval for any specific activity. Rather, as their titles indicate, the ESPRs and EDRs report on Logan Airport's general operating and environmental conditions.

Individual projects must also undergo MEPA review if they meet environmental regulatory review thresholds.

Airport projects undergo a project-specific, public environmental review process when state environmental review thresholds are met. When required pursuant to MEPA, Massport and Airport tenants submit **Environmental Notification Forms (ENFs)** and **Environmental Impact Reports (EIRs)**. If a project triggers a **National Environmental Policy Act (NEPA)** environmental review, the project is reviewed under the FAA's NEPA environmental review process. Chapter 4, *Airport Planning*, discusses current and potential future projects and their respective regulatory review status under MEPA, NEPA, or both. Chapter 10, *Project Mitigation*, reports on the on-going implementation of required mitigation commitments made in project-specific MEPA filings.

1.2.3 Document Layout and Format

In response to the comments within the Secretary of the Executive Office of Energy and Environmental Affairs' Certificate, (see Appendix A) and Comment Letters (see Appendix B, *Comment Letters and Responses to Comments*), Massport has reassessed the format and content of each chapter and the ESPR document as a whole, and as a result, has made significant changes to improve overall accessibility and readability. Content from each chapter was reorganized to keep 2022 findings and future forecast conditions, where applicable, as the central focus point within the main body text. Where appropriate, more technical information was relocated to the technical appendices.

To enhance content accessibility and reduce confusion around technical jargon, tables providing key terminology with definitions were added to assist readers. Key terminology is defined in bold colored font when first used in the main text. A new format was used to reduce large, information-dense blocks of text, and more visual elements were added with straightforward depictions of information.

Each chapter has color-coded block icons, or "tabs," in the upper corner of each page with a unique color assigned to each chapter and corresponding chapter number icon centered in the color block. For electronic viewers, the table of contents preceding this chapter has been hyperlinked to allow the reader to easily jump to sections quickly. Chapter and section references within the main body of the text have also been bookmarked and hyperlinked.

1.3 2022 and Future Planning Horizon Key Findings

This section provides a brief overview of key findings, by chapter, at Logan Airport in 2022, as well as forecasted and modeled future conditions over the Future Planning Horizon. Additional information concerning Airport activities is provided in subsequent chapters.

1.3.1 Sustainability, Outreach and Environmental Justice

Chapter 2, *Sustainability, Outreach and Environmental Justice* is a new chapter added to the ESPR this year in response to comments made in the Secretary's Certificate, which is provided in the *2022 ESPR* Appendix A. Chapter 2 is also in alignment with recent MEPA **Environmental Justice (EJ)** policy changes.

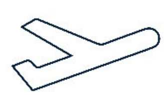
Chapter 2 discusses Massport's community outreach activities and EJ practices as well as highlights the measures taken to minimize environmental impacts from airport operations and improve operational efficiency. It also outlines Massport's community engagement efforts, including philanthropic donations that provide essential funding for community improvement programs; environmental stewardship initiatives; and projects that enhance or expand community greenspaces, like the Airport's open spaces and edge buffers initiatives. In addition, Chapter 2 details Massport's **sustainability** and **resiliency** programs, including Massport commitment to achieving net zero emissions, as described in Massport's Net Zero by 2031 program.

Sustainability, Outreach and Environmental Justice	
Massport expanded outreach and provided translation services in languages spoken by at least 5 percent of a given population located within a 5-mile radius of Logan Airport or within Massport Community Advisory Committee (CAC) communities.	Since 2014, Massport has funded the East Boston Neighborhood Health Center's efforts to expand their Pediatric Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program.
 Massport continues to maintain and increase open spaces within the East Boston. In 2023, Piers Park II was opened and consists of 4.5 acres with multi-generational exercise equipment and resiliency measures.	Massport published its *Roadmap to Net Zero by 2031* (Net Zero by 2031) in 2022, an ambitious plan to achieve net zero greenhouse gas (GHG) emissions from Massport facilities by 2031; Massport's 75th Anniversary.

1.3.2 Activity Levels and Forecast

Chapter 3, *Activity Levels and Forecasting* studies the recent trends in passengers, operations, and cargo at Logan Airport.

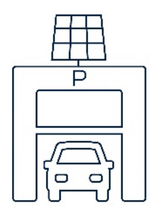
After COVID-19, 2022 saw an increase in activity, but still below 2019 levels. Chapter 3 describes the methodology for developing forecasts and reports on forecasted future airport activity, looking 10 to 15 years ahead over the Future Planning Horizon. These forecasts help to inform airport planning for potential future growth and are used to estimate future environmental conditions. The future forecast is developed considering factors such as global and regional economic trends, technological changes, and future airline actions. Updates within Chapter 6, *Ground Access*, Chapter 7, *Noise*, and Chapter 8, *Air Quality and Greenhouse Gas Emissions* each use outcomes derived from the Future Planning Horizon forecast to assess anticipated future conditions at Logan Airport.

<table>
<tr><th colspan="2">Activity Levels and Forecasting 2022 Key Findings</th></tr>
<tr><td>36.1 million passengers in 2022
59% higher than 2021
15% lower than 2019</td><td>378,613 Operations in 2022
31% higher than 2021
11% lower than 2019</td></tr>
<tr><td>From 1998 to 2022, there was a 36 percent increase in annual passengers despite a 25 percent decrease in annual aircraft operations, showing increased efficiency and higher load factors in 2022.
</td><td>In 2022, 40 airlines offered flights to 139 global destinations from Logan Airport; an increase from 2021 where there were 36 airlines and 125 global destinations.</td></tr>
<tr><th colspan="2">Future Planning Horizon Activity Levels Key Findings</th></tr>
<tr><td>53.5 million passengers are forecast over the next 10 to 15 years in the future (Future Planning Horizon), which aligns with trends projected in past ESPRs.</td><td>
Over the Future Planning Horizon, 495,000 operations are forecasted, which also aligns with trends projected in past ESPRs.</td></tr>
</table>

1.3.3 Airport Planning

Chapter 4, *Airport Planning* describes recently completed and on-going projects as well as future planning concepts. By regularly updating this information, stakeholders can track various projects currently underway and get a preview of potential projects likely to begin over the coming years. Chapter 4 also discusses possible activities or projects that might require a review under NEPA or MEPA regulations.

In this chapter, projects are grouped into the following categories: terminal areas; airside areas; service areas; ground access and parking; Massport's efforts to promote high-occupancy vehicle (HOV) ridership; and open spaces. Chapter 4 prioritizes providing status information for those projects delayed or deferred as a result of the pandemic, especially those projects intended to reduce operational or environmental impacts. Future projects are categorized as either short-term when the project is anticipated to be completed by 2028, or long-term if the project is anticipated to be complete or fully implemented by 2035.

Airport Planning Key Findings	
Phase 1 of the Terminal E Modernization project was under construction in 2022 and four new gates opened in 2023. The project has many sustainability features and is seeking **Leadership in Energy and Environmental Design (LEED®)** certification. 	To improve safety and efficiency, Massport moved the **RideApp** access area to the Terminal B Garage in 2022. This provided 60 more parking spots in the Central Garage, 4 of which were for **electric vehicles**. Massport continued to implement a parking management strategy to encourage HOV and shared ride options.
In 2022, Massport completed post-security connections between Terminals B and C, initiated feasibility studies for connections between Terminal A and Terminals B and E, and expanded passenger amenities following the completion of the Terminal B Modernization Project. Terminal roadways between Terminals B and C were reconfigured to improve access and reduce congestion.	 Planning for the Logan Airport Parking Project in front of Terminal E, resumed in 2022, after deferment during the pandemic. The updated project program will add approximately 4,300 spaces within the central terminal area to encourage long-term parking and will also improve on-Airport roadway connectivity.

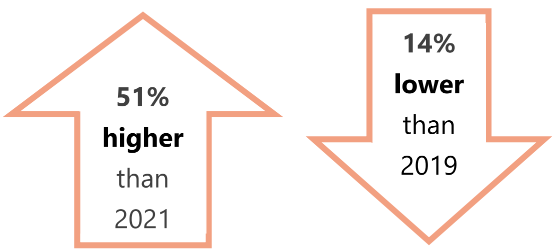
1.3.4 Regional Transportation

Chapter 5, *Regional Transportation* reports on Logan Airport's role in the wider New England transportation system, which includes other airports, highways, ports, and rail connections. Logan Airport, which is the largest of three airports run by Massport, is the main domestic and international entry point for the Boston Metropolitan Area and the New England region.

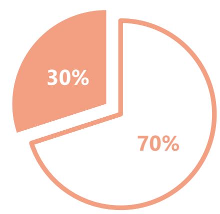
Chapter 5 presents 2022 aircraft and passenger activity levels as well as on-going and up-coming projects at airports in New England. In the last ten years, more people have been using rail connections between Boston, New York City, and Washington, D.C. as an alternative option for travel between these cities rather than choosing air travel via Logan Airport. Chapter 5 details transportation planning for the New England region for various transportation modes.

Regional Transportation 2022 Key Findings

New England regional airports, excluding Logan Airport, served approximately 15 million passengers in 2022.

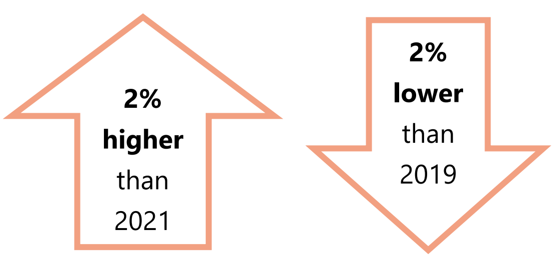


New England's 10 regional airports served 30 percent of New England's passengers in 2022.



The remaining 70 percent of New England passengers were accommodated at Logan Airport.

New England regional airports, excluding Logan Airport, conducted 622,461 aviation operations in 2022.



Massport owns and operates the commercial service Worcester Regional Airport and the **general aviation (GA)** airport, Hanscom Field.

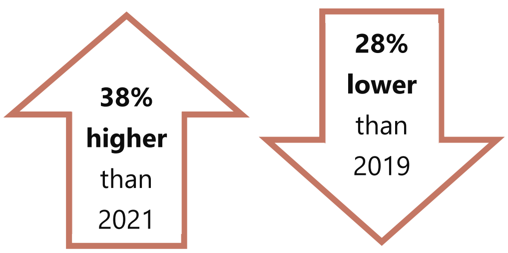
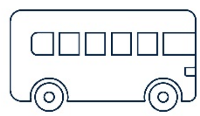
Hanscom Field was the second busiest airport by operations in New England after Logan Airport

Worcester Regional Airport welcomed its one millionth passenger in 2022.

1.3.5 Ground Access

Chapter 6, *Ground Access* evaluates trends in surface transportation modes used to access the Airport, including personal vehicles, shared ride services or RideApp services, shuttles, and HOV modes. Post-pandemic research indicates Logan Airport continues to be one of the top U.S. airports in terms of airport passengers and employees that routinely utilize HOV and public transit modes of transportation. Each type of ground transportation service available in 2022 showed increased ridership, demonstrating the use of the various access modes to Logan Airport are returning to pre-pandemic levels.

Massport continues to monitor conditions both at the Airport and among surrounding areas, and adapts its ground access programs to meet the needs of both air passengers and Logan Airport employees.

Ground Access 2022 Key Findings	
Average weekday on-Airport **vehicle miles traveled (VMT)** was 164,625 average daily miles traveled.  	 High occupancy vehicle (HOV) mode share reached 38 percent; exceeding Massport's goal of 35.5 percent HOV mode share by 2022.
Each type of ground transportation service available in 2022 showed increased ridership compared to 2021, indicating access modes to Logan Airport are returning to pre-pandemic usage levels and trends.	As requested by the community, Massport conducted a dwell time study, which measured actual durations of vehicle time spent idling at curbs and confirmed these times typically aligned with those modeled. Personal vehicle dwell times were longer outside of peak travel times when fewer vehicles were at the curb.

Ground Access Future Planning Horizon Key Findings	
Massport has and continues to make investments into Logan Express to accommodate future passengers' needs. Investments include increasing parking availability at key Logan Express sites, enhancing service frequency, adding new a new urban location, and considering pricing incentives.	In addition to Logan Express, Massport continues to incentivize HOV use for travel to and from the Airport. Measures like prioritizing certain Logan Airport roadways to optimize bus fleet operations, investments in and the expansion of Silver Line 1, continuing on-going and future improvements to Blue Line access, and continuing partnerships with private bus companies will encourage HOV use.
 In the Future Planning Horizon, VMT is anticipated to increase by 1 percent compared to 2019 VMT values.	Massport continues to identify infrastructure and operational modifications that would improve vehicular traffic flow at the Airport. For example, the Terminal B/C Roadway Project and RideApp access planning efforts are already complete and will have a lasting benefit to future operations at the Airport.

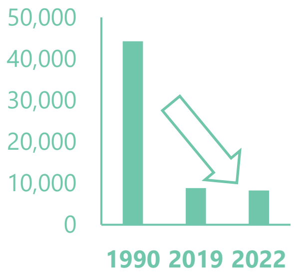
1.3.6 Noise

Chapter 7, *Noise* discusses the noise levels around the Airport in 2022 and Massport's on-going efforts to decrease aviation related noise at Logan Airport. Airport noise is measured using comprehensive flight information and the FAA's required noise model, which calculates noise exposure levels in **decibels (dB)**. Chapter 7, focuses on noise exposure levels in relation to the FAA level of significance (65 dB) for 2022 and the Future Planning Horizon. Chapter 7 also describes Massport's efforts over the past four decades to manage the impacts of noise on surrounding communities.

When noise exposure levels in 2022 were compared to data from previous years, the analysis revealed the geographic extent of the Airport's noise contours had decreased in recent years due to the retirement of older, noisier aircraft. In addition, future operations based on activity forecasts were used to model anticipated noise levels for the next 10 to 15 years, and these models predicted quieter environments due to expected advances in avionics and aircraft technology.

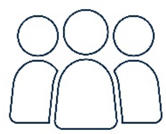
Noise 2022 Key Findings

Population in the 65 dB contour included 8,815 people 7 percent below 2019 and 80 percent below historic highs.



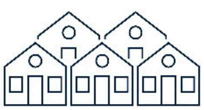
To date, Massport has invested over $170 million and provided sound insulation for 36 schools and 11,515 residential units. In 2022, Massport sought additional noise mitigation funding for eligible properties through Massport's Residential Sound Insulation Program (RSIP). The Noise Exposure Map (NEM) was updated to confirm eligibility, and Massport established a pilot program with the FAA to sound insulate eligible homes and re-evaluate sound insulation in homes treated before 1993.

Massport upgraded its Noise and Operations Monitoring System (NOMS), including 29 of the 30 monitors around Boston.



There were 1,301 noise complaint callers in 2022, which is 51 percent fewer callers than in 2019.

Noise Future Planning Horizon Key Findings



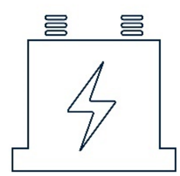
The **Day-Night Level (DNL)** 65 dB contour in the Future Planning Horizon remains within areas included in Massport's RSIP.

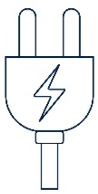
In the Future Planning Horizon, the modeled population within the 65 dB contour is estimated to be 9,435 people, which is well below historic highs.

1.3.7 Air Quality and Greenhouse Gas Emissions

Chapter 8, *Air Quality and Greenhouse Gas Emissions* provides details about Logan Airport's air emissions in 2022 in comparison to historical data. Airport emissions generally come from various sources including aircraft, ground service equipment (GSE), vehicles, buildings, and stationary sources. Tracking these emissions each year helps identify trends and enables future planning to reduce these emissions. Chapter 8 focuses on emissions of criteria pollutants and GHGs for 2022 and over the Future Planning Horizon.

Although aircraft activity levels have increased somewhat, technological advancements have led to reduced overall emissions. However, Massport's strong commitment to reducing emissions and energy-efficient strategies are expected to result in future emission levels remaining well below historical levels.

Air Quality and GHG Emissions 2022 Key Findings	
In 2022, the Boston Metropolitan Area, which includes Logan Airport, continued to remain below national ambient air quality standards (NAAQS) in 2022. Criteria pollutants include: • Volatile organic compounds (VOCs), • Nitrogen oxides (NO_X) • Carbon monoxide (CO) • Particulate matter (PM_{10}/$PM_{2.5}$)	 CO and VOC emissions in 2022 remained well below recorded historic highs for these emissions.
In 2022, Logan Airport Scope 1 and 2 greenhouse gas (GHG) emissions remained well below 2019 GHG levels. Massport-controlled, Scope 1 emissions represented 5.4 percent of Airport-wide GHG emissions; in-direct emissions from Scope 2 purchased electricity represented 7.3 percent; and Scope 3 emissions, which are public or tenant owned and controlled, represented 87.3 percent of total Logan Airport GHG emissions. Logan Airport GHG emissions represented less than 1 percent of the state's GHG totals.	 In 2022, PM_{10}/$PM_{2.5}$ emissions from stationary sources and other non-mobile sources were also greater than 2019 and 2021 levels. These sources include snowmelters, boilers, emergency generators, space heaters, and emissions from fire training activities. Results were also affected by changes in modeling assumptions for the assessment of 2022 data.

Air Quality and GHG Emissions Future Planning Horizon Key Findings	
In the Future Planning Horizon, criteria pollutants will remain below national ambient air quality standards (NAAQS). Criteria pollutants are predicted to increase and total emissions of carbon monoxide (CO) are predicted to decrease compared to 2022 levels. Reductions in CO emissions will be associated with converting ground service equipment (GSE) to commercially available electric alternatives, overall decreases in motor vehicle emissions, changes in aircraft fleet-mix, and emission reductions from implementing the *Roadmap to Net Zero by 2031* (Net Zero by 2031) program.	Over the Future Planning Horizon, Massport's Scope 1 GHG emissions are anticipated to decrease by nearly 90 percent compared to 2022 emissions. However, Scope 2 and 3 emissions are anticipated to increase from 2022 levels.  For instances when GHG emissions cannot be reduced to zero, Massport will invest in **carbon offsets** to reach the target.
 Massport is focused on reducing GHG emissions across all facilities and becoming net zero for Scope 1 activities under its direct control by 2031, coinciding with its 75th anniversary.	Massport's intends to purchase offsets that will benefit local projects within the State whenever practicable. Massport expects to be net zero for GHG emissions without offsets by 2040.

1.3.8 Water Quality

Chapter 9, *Water Quality* discusses the Airport's compliance with state and federal environmental regulations. Through regular monitoring and documentation of environmental conditions, Massport regularly assesses the Airport's environmental compliance program performance, including conditions like water and stormwater quality; fuel use and storage; and spill control and countermeasures. Massport is also continually developing, implementing, and evaluating new ways to maintain compliance standards while striving to improve policies and programs beyond regulatory mandates. This includes implementing Logan Airport's *Sustainability Management Plan* (SMP); managing stormwater; minimizing water use and surface water runoff; maintaining fuel storage and spill reporting compliance; performing environmental inspections; and improving plans and procedures to prevent pollution from accessing the surrounding environment.

Water Quality 2022 Key Findings	
In 2022, Massport performed environmental compliance inspections, conducted its annual *Stormwater Pollution Prevention Plan* (SWPPP) update meeting, and submitted the 2022 Annual Certificates of Compliance to the U.S. Environmental Protection Agency (U.S.EPA) and Massachusetts Department of Environmental Protection (MassDEP).	 In 2022, over 97 percent of stormwater samples collected were in compliance with standards for pH, oil and grease, and total suspended solids (TSS).
In 2022, 3 fuel spill incidents were over 10 gallons,  but none of these resulted in pollutant exposure to stormwater infrastructure or the discharge of pollutants to the aquatic environment.	Massport continues to assess, remediate, and bring its *Massachusetts Contingency Plan* (MCP) sites to regulatory closure.

1.3.9 Project Mitigation

Within the traditional MEPA process, "project mitigation" refers to specific project measures to "avoid, minimize, and mitigate environmental impacts." For the ESPRs and EDRs, the chapters associated with mitigation efforts include: project-specific mitigation required under Massachusetts General Law (MGL) c. 30, §§ 61 (**Section 61**) for projects required to prepare a state EIR; community commitments; and other environmental measures.

The Section 61 mitigation measures discussed in Chapter 10, *Project Mitigation* are specific to individual projects and generally include the steps taken to avoid and minimize potential environmental impacts through project design, construction, or during on-going operations. The status of Logan Airport projects with active Section 61 commitments are presented in Chapter 10, while additional community commitments and environmental measures are discussed in Chapter 2, *Sustainability, Outreach, and Environmental Justice*.

Project Mitigation 2022 Key Findings	
Within the MEPA process, Project Mitigation" refers to specific project measures to "avoid, minimize and mitigate environmental impacts." Project mitigation commitments outlined within a required Environmental Impact Report (EIR) for a project are required by law under Massachusetts General Law (MGL) Chapter 30, Section 61.	Massport also implements a wide range of other environmental programs that are not project-specific but rather aimed at addressing broader environmental impacts. These measures are described in Chapter 2, *Sustainability, Outreach, and Environmental Justice*.
The COVID-19 pandemic significantly reduced airport activity levels and revenue; prompting Massport, airlines, and other tenants to make operational adjustments. However, projects and programs deferred due to the reduced passenger levels have begun to resume.	Massport continues to comply with its project mitigation commitments as outlined in Project's Secretary's Certificates, included in Appendix A, *MEPA Certificates and Responses to Comments*.

2. Sustainability, Outreach, and Environmental Justice

This is a new chapter within the *2022 ESPR* that reorganizes and enhances information provided in previous Environmental Status and Planning Reports (ESPRs) and Environmental Data Reports (EDRs) on Massport's **sustainability** and **resiliency** efforts, environmental measures, and outreach and engagement activities associated with Logan Airport activities. In alignment with recent changes to Massachusetts Environmental Policy Act Office (MEPA) regulations, this chapter also discusses Massport's **Environmental Justice (EJ)** practices. This chapter provides an overview of measures Massport takes to avoid, minimize, and mitigate the environmental impacts of Airport operations and efforts to be a good neighbor to surrounding communities.

Chapter 10, *Project Mitigation*, details the project-specific mitigation for projects that met the MEPA requirements for preparation of an Environmental Impact Report (EIR). Beyond the measures required for individual projects, Massport also implements a wide range of ongoing initiatives to enhance operational efficiency and reduce overall Airport environmental impacts. Details on Massport's community open space and Airport edge buffers program are also presented in this chapter.

The following sections describe Massport's community engagement practices, EJ-focused measures, and Massport-wide sustainability and resiliency initiatives. Key environmental initiatives presented in this chapter include Airport-wide sustainability and resiliency programs, **greenhouse gas (GHG)** emissions reduction programs, and Massport's ambitious climate change initiative, the ***Roadmap to Net Zero by 2031* (*Net Zero by 2031*)**.

2022 Sustainability, Outreach, Environmental Justice and Key Findings

The following details key findings regarding sustainability, outreach, and EJ efforts at the Airport in 2022:

- The *Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy* (the Climate Roadmap Act) was signed into law in March 2021 and set targets for GHG emissions reduction in the state, including a goal of net zero GHG emissions by 2050. In support of this goal, Massport published its *Net Zero by 2031* plan to achieve net zero GHG emissions from Massport facilities by 2031.
- Massport's Community Relations & Government Affairs Department manages outreach efforts with community members and government officials through extensive and evolving public involvement practices that include engagement with neighbors and EJ communities.
- For this and future EDRs and ESPRs, Massport has expanded its EJ outreach to provide translation services in languages spoken by at least 5 percent of a given population located within a 5-mile radius of Logan Airport or within Massport Community Advisory Committee (Massport CAC) communities.
- The Massport CAC is made up of 35 representatives from impacted communities and serves as a forum for information sharing on projects, Massport initiatives, and other topics of interest.
- Massport conducted an EJ and public health existing conditions review. The Logan Airport **designated geographic area (DGA)** contains 64 EJ block groups, and both EJ and non-EJ populations within the DGA meet the Vulnerable Health EJ Criteria; meaning these populations likely experience health consequences consistent with the Vulnerable Health EJ Criteria.
- Massport continues to develop initiatives to limit cumulative environmental impacts from Airport operations.
- Massport funds community foundations in East Boston, South Boston, and Winthrop; each of which has a Board of Trustees that meets regularly to award grant funds to community programs and organizations that help improve the quality of life for residents.
- Since 2014, Massport has funded the East Boston Neighborhood Health Center's efforts to expand its Pediatric Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program.
- Each year, Massport awards scholarship grants to local high school seniors. Since 2007, Massport has awarded nearly $300,000 in scholarship grants for Diversity Science, Technology, Engineering, and Math (STEM) and Memorial Scholarships. Massport awards over $250,000 in grants to local non-profit organizations through the Charitable Contribution Program each year. Massport has set a goal to award at least 50 percent of the program's budget to programs predominately serving people of color.

2.1 Sustainability, Climate Adaption, and Resiliency

As the Boston area faces increasing temperatures, more frequent extreme weather events, and rising sea levels due to climate change, Massport recognizes the need to address its contributions to climate change; to thoroughly prepare for related impacts; and to protect its critical infrastructure, operational assets, and workforce. Through planning and regional collaboration, Massport will continue its leadership role in climate adaptation and resiliency planning in the region and among port authorities and the airport industry. For almost a decade, Massport has committed to improving its overall climate adaption and resiliency performance through implementing strategies including floodproofing buildings, operational planning for storm preparedness, innovative partnerships, regional collaboration, and reducing GHG emissions associated with Massport operations and activities.

Massport's Sustainability Vision - Massport will maintain its role as an innovative industry leader through continuous improvement in operational efficiency, facility design and construction, and environmental stewardship while engaging passengers, employees, and the community in a sustainable manner.

The following sections summarize the long-term and multifaceted sustainability initiatives undertaken by Massport. A history of Massport's sustainability planning is illustrated in **Figure 2-1**, and more information about Massport's resiliency programs is available at: https://www.massport.com/sustainability.

2.1.1 Massport Roadmap to Net Zero Greenhouse Gas Emissions

On March 26, 2021, the Climate Roadmap Act was signed into law, setting GHG interim targets for the state.[1] Targets include a 50 percent reduction in absolute GHG emissions by 2030, a 75 percent reduction by 2040, and an absolute GHG emissions reduction to 85 percent or less than 1990 GHG emission levels by 2050. The law also requires statewide net zero GHG emissions by 2050. These targets align with the federal government's net zero timeline and the 2015 Paris Agreement enacted by the United Nations (U.N.).[2,3] According to the U.N., achieving global net zero GHG emissions by 2050 is a crucial international goal to avert the worst impacts of climate change and preserve a habitable planet.[4]

1 Commonwealth of Massachusetts, Acts 2021, Chapter 8. March 26, 2021. An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy. Session Law 2021, c. 8, ss. 57-60. https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8.

2 Office of the Federal Chief Sustainability Officer, 2023. Net-Zero Emissions Operations by 2050, including a 65% reduction by 2023. https://www.sustainability.gov/federalsustainabilityplan/emissions.html.

3 United Nations Framework Convention on Climate Change, 2015. Paris Agreement. https://unfccc.int/process-and-meetings/the-paris-agreement.

4 United Nations Climate Change, 2023. For a livable climate: Net-zero commitments must be backed by credible action. https://www.un.org/en/climatechange/net-zero-coalition.

Figure 2-1 History of Sustainability at Massport

1979-Present
Comprehensive Annual Environmental Reporting for Logan Airport – the longest detailed tracking of environmental impacts of any U.S. airport (EDRs and ESPRs)

1986
Braintree and Framingham Logan Express launched – one of largest airport-run HOV services among U.S. airports

1999
1999 ESPR begins reporting on Massport's sustainability initiatives

2000
Sustainable design guidelines for Replacement Terminal A and American Airlines Terminal B, Pier A improvements published

2001
Massport sustainability strategy presented in Logan Airport 2001 EDR

2004
Massport's first Sustainability Plan published and documented in the 2004 ESPR
MBTA new Airport Blue Line Station opens and Silver Line service begins facilitating transit ridership to the Airport
Massport implements sustainable construction guidelines for contractors
Massport begins implementation of the EPA's Clean Air Construction Initiative (CACI)

2005
Massport implements Alternative Fuel Vehicle Policy
Terminal A Redevelopment certified as USGBCs first LEED®-certified airport terminal in the world

2007
Board approves Environmental Management Policy

2010
Massport participated in ACI-NA 2010 Environmental Benchmarking Survey focusing on solar, renewable energy and recycling

2013
Single- stream recycling initiated at all Massport facilities
Launch of Massport comprehensive resiliency program

2014
Massport developed Authority-wide Climate Resiliency Program – one of first among U.S. airports

2015
2015 Logan Airport Sustainability Management Plan published
Sustainable Massport Calendar published

2016
2016 Sustainable Massport Report published

2017
Held first Massport electric vehicle Ride and Drive event

2018
2018 Massport Sustainability and Resiliency Report published
Sustainability and Resiliency Design Standards and Guidelines (SRDSGs) published
Conducted comprehensive waste assessment at Logan Airport

2019
Sustainable Massport 2.0 Launched with charrettes authority-wide
Royal Dutch Shell installed its first electric vehicle (EV) charging stations in the U.S. at Logan Airport

2020
2020/2021 Massport Sustainability and Resiliency Report published

2021
2020/2021 Massport Sustainability and Resiliency Report published
Finalized Maritime Sustainability Plan
Massport undertakes the Net Zero Roadmap study
Massport begins Authority-wide assessment of building conditions at all facilities to determine building efficiency, energy consumption, and to identify opportunities for GHG reduction

2022
Floodproofing Design Guide published
Sustainability and Resiliency Design Standards published
Massport commits to achieve net zero GHG emissions for activities under its control by 2031
Massport stands up its Net Zero Program Office to implement the Net Zero roadmap recommendations
Awarded $615,000 from Massachusetts Clean Energy Center Accelerating Clean Transportation for All program to plan and facilitate the transition to EVs in the RideApp companies

In March 2022, Massport published its *Roadmap to Net Zero by 2031*,[5] an ambitious, Authority-wide program to achieve net zero GHG emissions by 2031 for the activities under Massport's control. The 2031 timeframe also coincides with the 75th anniversary of Massport's founding. For areas where GHG emissions cannot be reduced to zero, Massport will invest in **carbon offsets** to reach the target. Massport expects to be net zero without offsets by 2040. Carbon offsets are investments in GHG-reducing projects, such as solar farms, which lessen the overall impact of, or offset, an organization's own GHG emissions. Massport's preference is to purchase offsets that benefit local projects within the State. Achieving these net zero targets would put Massport nearly two decades ahead of the 2050 deadline called for in the Paris Agreement and the Climate Roadmap Act. As a key economic entity within the state, Massport will be a leader in achieving net zero within the State and the transportation industry.

Massport Net Zero By 2031 *Report Cover. Source: Massport.*

Existing GHG Emissions at Massport

To assess the pathways for achieving net zero, Massport established a GHG emissions baseline across its organizational footprint. As is standard, Massport inventoried and then categorized its emissions sources into Scopes 1, 2, and 3.

Scope Emissions at Logan Airport:

- Scope 1 and 2 = 12.5%
- Scope 3 = 87.5%

Scope 1 and 2 emissions make up 10.8% of Massport's total emissions

Scope 1 emissions sources are under Massport's direct control, such as emissions associated with buildings, facilities, Logan Airport's Central Heating Plant, and Massport's vehicle fleet and equipment. Massport owns or has direct control of sources, and retrofits or replacements would eliminate these GHG emissions.

Scope 2 emissions sources are not directly within Massport's control, but Massport has some ability to limit or remove these sources. An example would be purchased electricity from an electrical utility provider. Massport may have the option to purchase renewably sourced electricity from one utility over another, but cannot affect what providers are available or influence its ability to meet Massport's energy demands.

Scope 3 emissions sources are not under Massport's control or ownership, like those of Airport users and tenants. However, Massport encourages and supports these groups to voluntarily implement GHG emission reduction initiatives. Examples of Logan Airport's Scope 3 sources include energy consumed by tenant-owned or operated facilities or equipment, like fleet vehicles, commercial aircraft, or ground service equipment (GSE) for example, or from sources like employee and passenger ground transportation. While Massport cannot control, for example, whether a passenger will use their personal

5 2031 marks the 75th anniversary of the establishment of Massport.

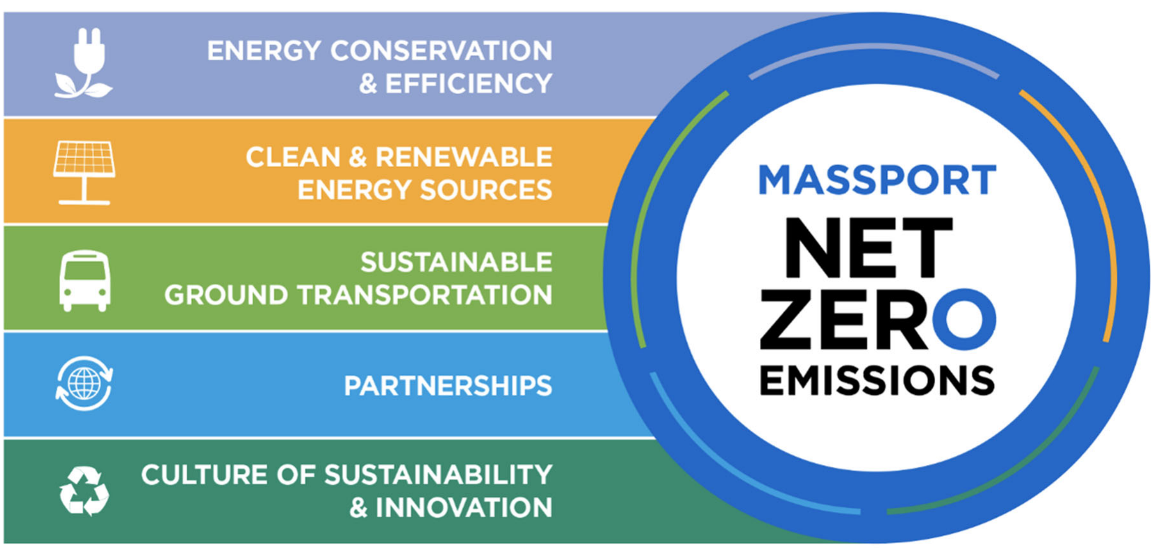
vehicle, Massport makes high-occupancy vehicle (HOV) use and public transportation options more accessible or affordable, thereby incentivizing GHG emissions-reducing behavior.

Between 2017 and 2019, Massport conducted an inventory of GHG emissions across its facilities. GHGs as a group are comprised of gases including carbon dioxide (CO_2), methane (CH_4), carbon monoxide (CO), and nitrous oxide (N_2O). For ease of reporting, Massport follows a common industry practice of converting measured GHG concentrations into metric tons of CO_2 equivalent ($MTCO_2e$).[6] In 2019, Logan Airport's total emissions were 808,125 $MTCO_2e$, with 51,359 $MTCO_2e$ from Scope 1 sources, 43,226 MTCO2e from Scope 2, and 713,540 $MTCO_2e$ from Scope 3. Logan Airport comprises approximately 86 percent of Massport's total Scope 1 and Scope 2 GHG emissions. Other relevant contributors to this total GHG emissions quantity include the Paul W. Conley Container Terminal and Flynn Cruiseport Boston, comprising 12 percent combined, and Laurence G. Hanscom Airfield and Worcester Regional Airport, comprising 2 percent combined.

Net Zero Roadmap

To meet Massport's net zero goals, five pathways were identified as illustrated in **Figure 2-2**. These pathways address the largest sources of Massport's controlled GHG emissions as well as the emissions it influences. These pathways also consider ways Massport can achieve additional sustainability benefits, such as advancing innovation within the industry and promoting collaboration and engagement through partnerships and Authority-wide engagement.

Figure 2-2 Net Zero GHG Emission Reduction Pathways to Implementation



6 U.S. Environmental Protection Agency (EPA), 2023. Greenhouse Gas Equivalencies Calculator. Website. Energy and the Environment. U.S. Environmental Protection Agency. https://epa.gov/energy/greenhouse-gas-equivalencies-calculator. Updated July 21, 2023.

For each of these pathways, GHG emissions reduction initiatives were identified. These initiatives were evaluated for their implementation practicality, emissions reduction potential, and capital costs. **Table 2-1** lists the priority initiatives produced by this evaluation process.

Table 2-1 Priority Emissions Reduction Initiatives

Pathway	Initiative
Energy Conservation and Efficiency	• Optimize building efficiency and conservation • Upgrade heating, ventilation, and air conditioning systems • Conduct an electrification infrastructure assessment study • Assess current and future building and equipment electrical demand • Determine options to achieve decarbonization for the Logan Central Heating Plant
Clean and Renewable Energy Sources	• Install solar photovoltaic arrays at Massport facilities and sites, where feasible • Evaluate alternative fuels for Massport operations, infrastructure, and equipment
Sustainable Ground Transportation	• Transition Massport fleet vehicles, including heavy-duty vehicles, shuttle buses, and Logan Express Buses to electric or alternative fuel vehicles.
Partnerships	• Develop partnerships with educational institutions, manufacturers, airlines, and energy providers • Integrate net zero and sustainability approach into the capital planning process
Culture of Sustainability and Innovation	• Implement a change management program across Massport • Develop and implement an internal education and training program

Net Zero Roadmap Implementation

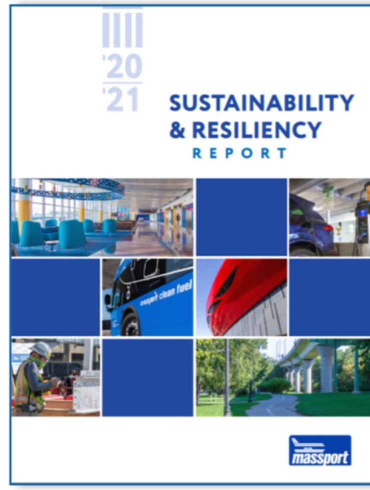
With the initial goals identified, Massport established a Program Management Office (PMO) involving a team of Massport staff and external subject matter experts leading the continued evolution and implementation of Massport's *Net Zero by 2031* program. The PMO guides the Authority towards achieving its net zero goals and objectives and assists Massport by:

- Assisting with implementing the pathways and initiatives identified in the *Net Zero by 2031* program;[7]
- Providing strategic thinking and planning for ongoing capital improvement projects and purchases;
- Identifying technological improvements and other forms of innovation pertinent to net zero;
- Tracking progress towards achieving net zero target goals and interim milestones;
- Working to verify that the net zero goal is understood and is positively affected by Massport's employees, business partners, and customers.

7 Massport, 2021. Roadmap to Net Zero. https://www.massport.com/massport/about-massport/roadmap-to-net-zero.

2.1.2 Sustainability Planning and Implementation

The *Net Zero by 2031* program builds on over a decade of sustainability and resiliency planning undertaken by Massport for its facilities and activities. Completed in 2015, the Federal Aviation Administration (FAA)-funded Logan Airport's *Sustainability Management Plan* (SMP) addresses sustainability holistically; considering economic vitality, operational efficiency, natural resource conservation, and social responsibility. The Logan Airport's SMP established a framework of goals, objectives, and an implementation plan with key performance indicators (KPIs); **Table 2-2** lists the Logan Airport's SMP's goals and objectives by sustainability category. The Logan Airport's SMP was then expanded into an Authority-wide Sustainable Massport program that addressed airport, maritime, and real estate assets. The *Sustainability and Resiliency Report*[8] (Sustainable Massport 2.0) builds and expands on the work started with Logan Airport's 2015 SMP. Having tracked progress on its sustainability goals for over a decade, Massport has a solid foundation for the *Roadmap to Net Zero by 2031* described in Section 2.1.1.



2020-2021 Sustainability and Resiliency Report Cover. Source: Massport.

The *2020 and 2021 Sustainability and Resiliency Report*, included new initiatives that Massport explored to be a better community partner through reducing noise and air pollution, improving ground access to Logan Airport, and extending **diversity, equity, and inclusion (DE&I)** initiatives beyond its operational borders.

The progress made towards achieving the Logan Airport's SMP program's goals and objectives is published in sustainability reports, which also highlight Massport's efforts to improve and enhance sustainability and climate resiliency across the entire organization. The most current Massport Sustainability, Net Zero, and Resiliency Reports can be found at: https://www.massport.com/sustainability. Massport's next sustainability and resiliency report covering 2022 and 2023 will be published in 2024.

8 Massport, April 2018. Sustainable Massport; Annual Sustainability & Resiliency Report. https://www.massport.com/media/2774/massport-annual-sustainability-and-resiliency-report-2018_lr.pdf.

Table 2-2 Logan Airport Sustainability Goals and Descriptions

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

Source: Logan Airport's 2020/2021 SMP.

Resiliency Planning

Climate change is a real and urgent issue, causing a wide range of increasingly significant impacts such as rising sea levels, extreme storms, heavy precipitation, coastal flooding, and extreme heat. Massport recognizes the importance of taking action to mitigate and prepare for these impacts to protect critical infrastructure, operations, and surrounding communities. Massport embraces an integrated, comprehensive approach to climate change through resiliency planning and adaptation.

In 2013, Massport launched a comprehensive resiliency initiative to maximize business continuity amidst various human and natural threats. Massport's efforts are guided by the following goals:

- Improve resiliency overall for infrastructure and operations;
- Restore operations during and after disruptive events in a safe and economically viable timeframe;
- Create robust feedback loops that allow for adaptability and new solutions as conditions change;
- Adapt operations and policy, and implement design-build decisions, through the application of sound scientific research and principles that consider threats, vulnerabilities, and cost-benefit calculations;
- Become the ideal model of a knowledge-sharing, forward-thinking, and resilient port authority;
- Work with key influencers and decision-makers to strengthen understanding of the human, national, and economic security implications of extreme weather, changing climate, and anthropogenic threats to Massport's facilities and the region;
- Review capital programs, tenant alterations, real estate projects, and asset management projects for compliance with Massport's *Floodproofing Design Guide* (see https://www.massport.com/environment/sustainability/resiliency); and
- Conduct annual pre-hurricane season tabletop exercises and flood barrier training exercises.

In addition to protecting Massport-owned assets, the Authority has been collaborating with regional resiliency efforts, including the Massachusetts Executive Office of Energy and Environmental Affairs (EEA) ResilientMass program, U.S. Army Corps of Engineers (U.S.ACE), and City of Boston initiatives to protect surrounding communities. Massport's open space and airport edge buffer parks are an example of this district-scale resiliency approach. As described in Section 2.2.3.9, Massport has worked with communities to develop a system of parks and open spaces encompassing over 30 acres. These green spaces capture GHG emissions, provide relief from extreme heat, and create recreational opportunities, and waterfront parks, like Piers Park I and II and the Navy Fuel Pier Buffer, establish a buffer area for neighborhoods in the event of extreme flooding.

2.1.3 Sustainable Design and Construction Guidelines

Massport is committed to being a leader in sustainable design and construction across all of its business lines, including Logan Airport. New construction and reconstruction or rehabilitation projects for both physical buildings and infrastructure of any square footage or monetary value at the Airport are considered within Massport's comprehensive approach to sustainability and resiliency within the built environment.

Design Guidelines for Sustainability, Net Zero, and Resiliency

The 2018 edition of Massport's ***Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs)** codifies the sustainable practices Massport is currently working to achieve. These practices, documented in the Logan Airport's SMP and subsequent sustainability and resiliency reports, are requirements for both vertical and horizontal projects on Massport property. As applicable and feasible, the SRDSGs reference and incorporate state and local policies and plans such as the *Global Warming Solutions Act of 2008* and the Boston Zoning Code Article 37.

The standards are currently being updated to reflect the latest net-zero criteria and address topics like embodied carbon emissions and occupant health and wellness. More recent state and local policies, such as the *2021 Climate Roadmap Act*, the *Massachusetts Clean Energy and Climate Plan for 2025 and 2030*, *House Bill 5060: An Act Driving Clean Energy and Offshore Wind*, and *House Bill 5151: An Act Relative to Massachusetts's Transportation Resources and Climate* (MassTRAC), will also be referenced in the update to the SRDSGs, which is planned for publication in 2024.

Sustainability Rating Systems

Massport's SRDSGs include requirements from industry-leading green building rating systems, such as the U.S. Green Building Council's (U.S.GBC) Leadership in Energy and Environmental Design™ (LEED®) rating system.[9] If LEED® eligible, Massport-owned projects must achieve LEED® Gold Certification or higher. **Table 2-3** lists LEED®-certified Massport facilities. In addition to U.S.GBC's LEED® Certification requirement, Massport's next iteration of its SRDSGs is expected to incorporate the Institute for Sustainable Infrastructure's (ISI's) Envision™ rating system.[10]

9 The Leadership in Energy and Environmental Design™ (LEED®) rating system is a globally recognized green building certification system developed by the U.S. Green Building Council (U.S.GBC). It provides a framework for healthy, highly efficient, and cost-saving green buildings, and indicates sustainability achievement and leadership.

10 The Institute for Sustainable Infrastructure's (ISI's) Envision™ rating system is a comprehensive framework and certification system that assesses the sustainability of infrastructure projects across five categories: quality of life, leadership, resource allocation, natural world, and climate and resilience.

Table 2-3 Leadership in Energy and Environmental Design (LEED®)-Certified Facilities at Logan Airport

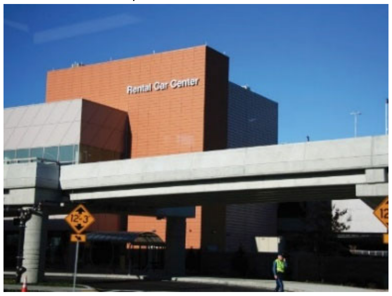
Project, Year Completed, LEED® Certification	LEED® Features
Massport Projects	
Terminal A, LEED® Certified, 2006 	• First airport terminal in the world to be LEED® Certified • Priority curb locations for high-occupancy vehicles (HOVs) and bicycles • Rooftop solar panel retrofits • Stormwater filtration systems • Reflective roof materials reduce heat island effect • Water consumption reduction features • Natural daylight paired with advanced energy-efficient lighting technologies • Recycled and regionally sourced building materials • Indoor air quality enhancement measures
Green Bus Depot, LEED® Silver, 2014 	• Rooftop solar panels • Water and energy-saving features • Vehicle miles traveled (VMT) reduction measures • New shuttle fleet includes clean diesel-electric hybrid and compressed natural gas (CNG) buses • Sustainably grown, harvested, produced, and transported building materials
Rental Car Center (RCC), LEED® Gold, 2015 	• Green building materials, including recycled and regionally sourced building materials • Rooftop solar panels • Bike and pedestrian access and connections • Natural daylight paired with advanced energy-efficient lighting technologies • Indoor air quality enhancement measures • Plug-in stations for electric vehicles (EVs) • Rental car fleets including electric, hybrid, and low emissions vehicles • Employee showers and changing areas to promote cycling or walking to work • Recycling and reuse of vehicle wash water • Stormwater reclamation for non-potable uses such as vehicle washing and landscaping irrigation • VMT reduction measures

Table 2-3 Leadership in Energy and Environmental Design (LEED®)-Certified Facilities at Logan Airport

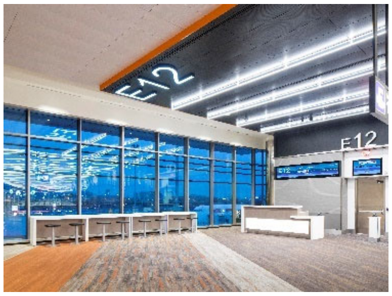
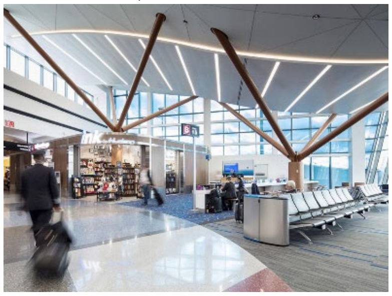
Project, Year Completed, LEED® Certification	LEED® Features
Terminal E New Large Aircraft Wing, LEED® Gold, 2017 	• Reflective roof materials and a light color concrete tarmac to reduce heat island effect • Low-flow water fixtures and water closets • Efficient light fixtures and efficient heating, ventilation, and air conditioning (HVAC) system • Renewable energy source usage • Recycled and regionally sourced materials • Indoor air quality enhancements • Solar-thermal domestic hot water system heats 100 percent of the wing's domestic water needs
Terminal B Gates 37-38, LEED® Gold, 2019 	• Energy Star® certified equipment used • Forest Stewardship Council (FSC®) certified wood products used • Expansive windows and outdoor views promote passenger comfort and well-being while reducing energy use for lighting
Terminal B Optimization, LEED® Silver, 2022 	• Energy conservation measures implemented for improved performance • Recycled or local materials utilized where feasible • Reused over half of the prior building structure or envelope • Significant construction and demolition waste diversion • Implemented water conservation measures to reduce potable water use. • Facility designed to maximize outdoor views and lighting

Table 2-3 Leadership in Energy and Environmental Design (LEED®)-Certified Facilities at Logan Airport

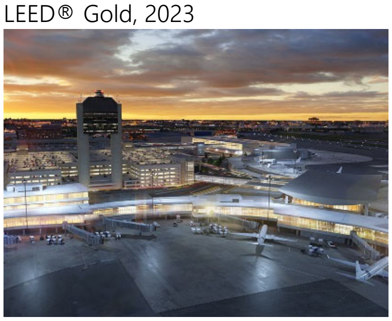
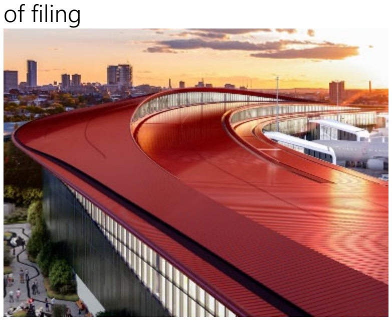
Project, Year Completed, LEED® Certification	LEED® Features
Terminal C to B Connector, LEED® Gold, 2023 	• Energy-efficient exterior and interior lighting • High-performance glazing on transparent curtain walls. • Electric vehicle (EV) charging infrastructure for electric ground support equipment (eGSE) • Energy efficient HVAC systems provide annual energy savings over baseline • Reflective roof materials and a light color concrete tarmac to reduce heat island effect
Actively Pursuing LEED® Certification	
Terminal E Modernization, LEED® Gold, in progress at the time of filing 	• View dynamic glazing on the hold room curtainwall system reduces glare and solar gain, and allows for overall cooling load reductions • Onyx™ photovoltaic glazing on the southern elevation provides electrical energy generation while providing a solar screen that eliminates glare and reduces overall cooling loads • Displacement ventilation throughout the Great Hall passenger hold room and concourse spaces provide a 17 percent increase in HVAC energy efficiency • New critical infrastructure equipment elevated above established 100-year flood elevation for enhanced system resiliency during extreme weather events
Tenant Projects	
Signature Flight Support General Aviation Facility, LEED® Certified, 2008 	• Water use reduction measures • Natural daylight paired with advanced energy-efficient lighting technologies • Window glazing and sunshades to maximize daylight and minimize heat build-up • Recycled and regionally sourced materials • Measures to enhance indoor air quality

Table 2-3 Leadership in Energy and Environmental Design (LEED®)-Certified Facilities at Logan Airport

Project, Year Completed, LEED® Certification	LEED® Features
Nouria Service Center, LEED® Silver, 2020 	• Energy-efficient lighting and HVAC systems • Installed efficient water fixtures. • Installed rooftop Solar array. • Installed direct current (DC)-Fast Chargers for EV Vehicles

2.2 Massport Community Engagement and Environmental Initiatives

Massport has and will continue to champion community benefits and robust community engagement. Working in concert with government, community, and civic leaders throughout Massachusetts and New England, Massport is actively engaged in advancing environmental initiatives and expanding community programs for residents living near Massport's facilities.

2.2.1 Massport Community Giving

Each year, the **Massport Charitable Contribution Program** provides grants to community organizations to help fund programs in areas such as youth education, arts and culture, social service, the environment, and athletics. Massport has set a goal to award at least 50 percent of the program budget to organizations serving predominately people of color. In fiscal year 2022 (FY 2022), Massport surpassed this goal by awarding 69 percent of the total FY 2022 budget to organizations or programs serving predominately people of color. A full list of the community organizations funded by Massport in FY 2022 can be found in Appendix E, *Environmental Justice Supporting Materials*, Section E.1.

In 2022, Massport distributed $600,000 to fund 275 youth summer employment positions through the **Community Summer Jobs Program**. The annual program helps civic and social service agencies by providing funds to hire youth workers in Massport's neighboring communities including Bedford, Charlestown, Chelsea, Concord, East Boston, Lexington, Lincoln, Revere, South Boston, Winthrop, and Worcester. Without the assistance of Massport's Community Summer Jobs Program, many local organizations would not be able to offer affordable summer programs to residents. Since 1991, thousands of local students have gained valuable work experience in various jobs, such as camp counselors, office assistants, maintenance workers, and lifeguards; positions funded by Community Summer Jobs Program grants.

Massport collaborated with local and state governments, municipalities, and other charitable organizations to establish and fund the **East Boston Foundation, South Boston Foundation**, **and Winthrop Foundation**. Beginning with the East Boston Foundation in 1997, Massport has provided over $16 million in funds for vital programs in these highly impacted communities. In 2022, the community foundations awarded over $600,000 to local organizations, helping to improve the quality of life for area residents.

Massport provides annual funding to the **East Boston Neighborhood Health Center** to help expand the efforts of its Pediatric Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop. The program provides services including screenings for children, distribution of asthma kits, and home visits.

Massport awarded **Diversity STEM and Memorial Scholarships** to six local students in 2022. Each year, high school students are selected to receive two Diversity STEM Scholarships and the Thomas J. Butler, Deborah Hadden Gray, Donna Rauseo, and Lowell L. Richards III Memorial Scholarships based on their academic achievements, post-secondary educational plans, and demonstrated commitment to community service. Since 2007, Massport has awarded Diversity STEM Scholarships to 46 students of color who plan to pursue degrees in a STEM field. Since 2011, Massport has awarded Memorial Scholarships to 38 students. Massport also provides annual scholarship grants to local high schools for students in Charlestown, Chelsea, East Boston, South Boston, Revere, and Winthrop.

As part of Massport's history of community engagement, Massport employees volunteer in community activities throughout the year such as a children's winter coat drive, Veterans Day initiatives, a Thanksgiving food drive, a children's backpack drive, a women's shelter donation drive, and community beautification projects.

2.2.2 Diversity, Equity, and Inclusion (DE&I)

As an engine for economic growth, Massport continually strives to extend economic opportunities and create equity for diverse people and businesses, internally and in surrounding communities. Leveraging real estate to bring more Bostonians to the table, Massport pioneered a DE&I model, known as the "Massport Model," for its real estate development programs and projects to expand economic opportunities through a competitive, market-driven process. The Massport Model focuses on including people of color and women in significant ownership and leadership roles in every aspect of a project, from development to property management. The model does not prescribe how to incorporate DE&I, but instead gives the private sector the flexibility to propose new and creative approaches.

The Massport Model was first applied in 2016 for the project to develop the Omni Boston Hotel at the Seaport. In that competitive bid, Massport said DE&I was as important as traditional evaluation criteria;

namely financials, design, and ability to execute. Smaller, women- and minority- owned firms, businesses historically excluded from large projects in the city, partnered with some of the region's largest development, architecture, and construction firms to bid, which resulted in a broadly diverse team as well as $7 million in equity from minority investors.

The Massport Model continues to evolve with the Seaport Circle project, which will house the South Boston Waterfront Job Training Pavilion and benefit a wide array of Bostonians by providing workforce training for high school graduates and underserved residents. The most recent application of the Massport Model was an RFP issued in 2021 for a mixed-income, affordable housing project on D Street in South Boston. Proposals will be evaluated equally for DE&I commitments, housing affordability, design, and ability to execute. The Massport Model has also begun to be emulated by other agencies and municipalities.

The **Massport Model** sets a policy to consider DE&I evaluation criteria and incorporating DE&I into project plans and execution to be as important as traditional architecture, design, and construction considerations.

2.2.3 Environmental Initiatives

Massport is committed to minimizing the effects of its operations on the community and environment by implementing a comprehensive set of Airport-wide initiatives that benefit the neighbors, Airport users, Airport employees, and the traveling public. These include, but are not limited to, the environmental initiatives listed in the following sections, which Massport has undertaken to lessen the Airport's environmental impacts. These initiatives are different from formal project environmental mitigation commitments as they are not tied to projects, and more generally reduce overall operational and environmental impacts from Airport sources. Conversely, MEPA Section 61 commitments are binding mitigation commitments made in past MEPA project filings developed by Massport to address project-specific environmental impacts. Updates on implementing Section 61 commitments for projects requiring mitigation are detailed in Chapter 10.

2.2.3.1 High-Occupancy Vehicle (HOV) Strategy

Massport employs numerous strategies to provide ground transportation options for Logan Airport passengers and employees to reduce emissions associated with accessing the Airport. Massport's goal is to maximize the use and capacity of HOV, transit, and RideApp options that are convenient and reliable and reduce environmental and community impacts. Massport continues to promote, operate, and support HOV and RideApp services to improve operations along Terminal-area roadways and at curbside areas, alleviate parking constraints, improve customer service, and minimize emissions.

Massport regularly evaluates and updates its strategies to improve and expand Logan Airport ground access services with a strong focus on HOV service modes. Central to this strategy is continued investment in Logan Express facilities and service. Logan Express is the seventh largest transit system in

Massachusetts and annually carries passengers and Airport employees between Logan Airport and five metropolitan locations.

Logan Express schedules were adjusted in March 2020 in response to the COVID-19 pandemic and the subsequent decline in ridership. As of October 2022, all Logan Express services have been restored following pandemic-related service cuts. The historically underperforming Peabody Logan Express operation has been relocated to a more convenient location at the North Shore Mall, the Back Bay Logan Express service has been restored, and plans are currently moving forward to expand the Framingham Logan Express parking garage. More information can be found in Chapter 6, *Ground Access*, Section 6.3.1.2, and Chapter 4, *Airport Planning*, Section 4.1.

In close partnership with the Massachusetts Bay Transportation Authority (MBTA), Massport purchased eight Silver Line rapid transit buses in 2004 for service between the Logan Airport Terminals, South Station, and South Boston. Since the existing Silver Line fleet is reaching the end of its useful life, Massport has recently purchased ten new Silver Line electric or hybrid buses as part of an MBTA procurement program. This will allow expansion of Silver Line service between Logan Airport and downtown. Since 2012, Massport has subsidized free Silver Line rides from the Airport to South Station. More information can be found in Chapter 6.

2.2.3.2 RideApp Management

RideApp services like Lyft™ and Uber™ remain a popular option for travelers getting to and from Logan Airport. Massport has developed strategies and will continue improving approaches to facilitate the efficient operation of diverse modes of ground transportation. To alleviate congestion and reduce GHG emissions, Massport has implemented a robust plan to manage RideApp operations and reduce RideApp deadhead trips.[11] For more detailed information on Massport's RideApp Management Plan, please see Chapter 6, Section 6.5.6. Among this plan is a new initiative to promote electrification of the RideApp fleet serving Logan Airport.

2.2.3.3 Long-Term Parking Management Plan

Logan Airport's parking supply, pricing, and operations are managed to promote the use of HOV, transit, and RideApp options as well as to reduce drop-off and pick-up modes, which generate up to four vehicle trips instead of two and higher emissions. Chapter 6, Section 6.5.7 provides additional updates on the evolving implementation of ground access strategies.

2.2.3.4 Noise Abatement and Sound Insulation

Massport's comprehensive noise abatement program includes the implementation of flight tracks designed to optimize over-water operations, especially during nighttime hours, runway restrictions for noisier aircraft, and noise-reducing ground run-up procedures. Massport has one of the nation's oldest

11 Deadhead trips are trips where vehicles travel to or from the Airport without additional passengers other than the driver.

residential and school sound insulation programs for those eligible under federal guidelines; to date, Massport has provided sound insulation for a total of 36 eligible schools and 11,515 residential units with investments of over $170 million towards these efforts, and Massport will continue to seek funding to provide mitigation for eligible properties whose owners have chosen to participate. Massport also operates a dedicated Noise Abatement Office with a state-of-the-art Noise and Operations Monitoring System (NOMS).

In response to advocacy efforts by elected officials and Massport, for the first time, the FAA will allow eligible homes treated prior to 1993 to be treated again under the sound insulation program.[12] In 2022, Massport was approved by the FAA for an initial grant to fund the beginning phase of a new Residential Sound Insulation Program (RSIP). Appendix I, *Noise Supporting Documentation* contains data on the residential buildings, dwelling units, and schools that have been sound insulated by Massport.

Massport has one of the nation's oldest residential and school sound insulation programs, and has provided sound insulation for 36 schools and 11,515 residences with investments of over **$170 million**.

In June 2022, Massport and FAA concluded work with the Massachusetts Institute of Technology (MIT) to identify opportunities to reduce noise through changes to performance-based navigation (PBN) systems, including area navigation (RNAV). This was a first-in-the-nation project between the FAA and an airport operator to better understand the implications of PBN and evaluate strategies to address community concerns about aircraft noise. Massport continues to coordinate with the CAC, FAA, and MIT on additional targeted technical questions and reviews. Massport is working with the FAA's Aviation Sustainability Center (ASCENT) on research projects concerning aircraft noise, flight procedures, and air quality monitoring related to **ultrafine particles (UFPs)**. These efforts and progress towards achieving noise reduction goals and UFP air quality monitoring can be found in Chapter 7, *Noise*, Section 7.4, and Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.3.1.4, respectively.

2.2.3.5 Air Emissions Reduction

Massport is a national leader in studying, tracking, and reporting on the air quality environment of Logan Airport and implementing measures to reduce emissions. Initiatives include a commitment to sustainable design with all Massport capital projects; operating the state's seventh largest transit system (Logan Express); providing pre-conditioned air (PCA) and 400 Hertz (Hz) power at aircraft contact gates to reduce aircraft idling; and operating one of the largest privately operated, publicly accessible, compressed natural gas (CNG) stations in New England. More information can be found in Chapter 8, Section 8.6.

12 FAA Airport Improvement Handbook, Table C-5 Item (8), page C-19.

2.2.3.6 Alternative Fuel Vehicles (AFV) Program

Massport established a vehicle procurement policy in 2006 that requires consideration of AFVs when purchases are made. The Alternative Fuel Vehicles Program is designed to replace Massport's conventionally fueled fleet whenever feasible with alternatively fueled or powered vehicles to help reduce emissions associated with Logan Airport operations. Massport now operates more than 100 vehicles powered by gasoline-electric hybrid, diesel-electric hybrid, CNG, propane, flex fuel, and plug-in electricity. More information can be found in Chapter 8, Section 8.5.

2.2.3.7 Electric Ground Service Equipment (eGSE)

Massport is facilitating the replacement of gas- and diesel-powered ground service equipment with **electric GSE (eGSE)**, if commercially available. In 2020, Massport was awarded an FAA Voluntary Airport Low Emission (VALE) Program grant for charging infrastructure at Terminal E and installing 10 eGSE charging stations at Signature Aviation Building 14.

2.2.3.8 Energy Planning

Massport has a long-standing energy management program committed to supply-side wholesale energy management and procurement, and demand-side energy efficiency and renewable energy development. Supply-side wholesale purchasing is managed through an interdepartmental advisory group consisting of representatives from Massport's Administration and Finance, Building Operations, Capital Programs Department, and the Environmental Affairs Department. Procurement is guided by a Massport Board-approved Energy Hedge Policy. Demand management is through individual capital projects and stand-alone measures, where feasible, including investments in high-efficiency lighting and equipment and automated building energy management and control systems. Renewable energy planning has included a Massport-wide evaluation of feasible, third-party financed, renewable energy development sites designed in coordination with the Commonwealth of Massachusetts Solar Massachusetts Renewable Target Program (SMART). As part of this evaluation, all Massport properties were considered for potential solar development.

Massport will continue to evaluate renewable energy development potential across all its properties. Massport has existing self-financed solar panel installations at Logan Airport, including locations on top of Logan's Economy Garage, Terminal B Garage, Rental Car Center, Terminal A, and the Terminal C Canopy. Previously, Massport formed a public-private partnership to develop its largest existing 357 kWh solar installation on the roof of Terminal A and associated satellite buildings, which was part of a statewide solicitation to facilitate American Recovery and Reinvestment Act (ARRA) grant funding for solar energy.

2.2.3.9 Open Space and Airport Edge Buffers

Over the last two decades, Massport has developed an extensive open space program to enhance surrounding communities with more than $25 million invested towards the planning, construction, and maintenance of four airport edge buffer areas and two parks along Logan Airport's perimeter. Today, approximately 40 acres of green space are developed or managed by Massport in partnership with the East Boston community and as a response to engagement with the community. Massport also collaborates in East Boston's open space planning through meetings with other agencies, including the Massachusetts Department of Transportation (MassDOT), the City of Boston, and the MBTA.

Piers Park II broke ground on October 14, 2022, and was completed in December 2023, adding approximately 4.5 acres of green space to the East Boston waterfront. Sustainable elements of the Phase II design included:

Opening of Piers Park II, December 2023. Source: Massport

- Elevating the park site and creating landscape berms to provide flood protection;
- Replacing the current gravel lot with 4.5 acres of green space and planting 80 new trees;
- Installing drinking fountains with bottle filling stations;
- Placing energy-efficient lighting throughout the park and at the new Sailing Center building, and;
- Building a highly efficient heating and cooling system in the new Sailing Center building.[13]

Figure 2-3 illustrates the location of the Airport edge buffers and parks. **Table 2-4** provides a key to **Figure 2-3** with a description and history of each airport edge buffer and open space.

13 Massport. East Boston Community Celebrate Piers Park II Groundbreaking. October 14, 2022. Website. https://www.massport.com/media/newsroom/massport-east-boston-community-celebrate-piers-park-ii-groundbreaking.

Figure 2-3 Airport Edge Buffer Projects and Open Space

2022 Environmental Status and Planning Report

Massport Open Space

0 500 1,000 2,000 Feet

Table 2-4 Description and Status of Airport Edge Buffer Projects and Open Space

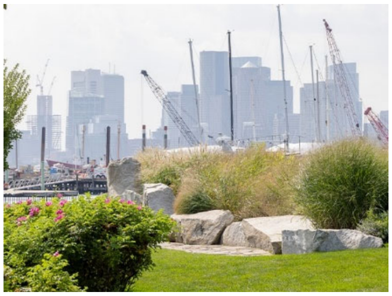
Map ID	Description (Completion Year)	Photo
1	**Piers Park I (1995), Piers Park II (2023)**	
	Piers Park, previously a 7-acre industrial site, opened in 1995 on the East Boston waterfront. The features a picnic area, fitness course, children's playground, spray park, outdoor amphitheater, pier, and community sailing facility. Piers Park II, an addition of 4.5 acres, features a central lawn area, children's playground, climbing structure, music garden, spray fountain, and a multigenerational fitness area. Upgrades included resiliency landscape features, elevated for flood protection, and a new community sailing center building. Piers Park II was one of the high-impact community benefit projects identified by both the City of Boston and members of the Logan Impact Advisory Group (LIAG) through their review of the Terminal E Modernization Project.	
2	**Navy Fuel Pier Airport Edge Buffer (2007)**	
	The Navy Fuel Pier Airport Edge Buffer project started in 2001 with remediation of the former Navy Fuel Pier by the U.S. Army Corps of Engineers (U.S.ACE). The project beautified 0.7 acres through landscape improvements and waterfront stabilization and installed an interpretive panel detailing local history. This former 1940s Navy refueling pier is now an idyllic waterfront open space with walking paths and seating for the Jeffries Point neighborhood of East Boston.	
3	**Mary Ellen Welch Greenway (2007)**	
	The Mary Ellen Welch Greenway, previously known as the East Boston Greenway, is a former Conrail line transformed into a 3.3-mile rail trail and park, extended by the East Boston Greenway Connector and Narrow-Gauge Connector. It runs continuously across the majority of East Boston and links significant Massport-owned and operated open space, such as Piers Park and Bremen Street Park, and other open spaces such as Memorial Stadium, Wood Island Bay Marsh, and Constitution Beach. The Greenway opened in 2007 as a shared space for walking, running, and cycling and was renamed in honor of local advocate Mary Ellen Welch in 2019.	

Table 2-4 Description and Status of Airport Edge Buffer Projects and Open Space

Map ID	Description (Completion Year)	Photo
4	**Southwest Service Area (SWSA) Airport Edge Buffer (Phases I: 2006, Phase II: 2014)**	
	Phase I included construction of a 0.5-acre area with landscaping and lighting enhancements on Maverick Street, including evergreen and deciduous trees, ornamental shrubs, and groundcovers. Phase I employed dense landscaping and solid barriers like fences and walls to enhance the separation and connectivity between Maverick Street and East Boston Memorial Park and Stadium.	
5	**Bremen Street Park (2008) and Dog Park (2016)**	
	Constructed as part of the Central Artery and Tunnel Project and operated by Massport, the 18-acre park on Bremen Street serves as East Boston's second-largest neighborhood park. Previously a rail yard, it now provides facilities like a community garden, picnic area, children's play areas, and a direct pedestrian connection to the MBTA Blue Line Airport Station and the East Boston branch of the Boston Public Library. Located along Breman Street, the park connects to the Mary Ellen Welch Greenway. The 0.5-acre dog park was constructed later by Massport and holds the distinction of being East Boston's first.	
6	**Neptune Road Airport Edge Buffer (2016)**	
	The Neptune Road Airport Edge Buffer, a Massport community mitigation project, buffers the East Boston Neighborhood at Logan Airport's northwestern edge. This 1.5-acre parcel, adjacent to the MBTA's Wood Island Station, is primarily in the Runway 15R-33L Runway Protection Zone (RPZ). The project incorporates Olmsted-inspired landscaping to honor and acknowledge Wood Island Park and the surrounding neighborhood, which was lost in the 1960s due to airport expansion. The buffer features interpretive elements that complement the nearby North Service Area Roadway Corridor and extends the pedestrian and bicycle path to Bennington Street.	

Table 2-4 Description and Status of Airport Edge Buffer Projects and Open Space

Map ID	Description (Completion Year)	Photo
7	**East Boston Greenway Connector (2014)**	
	The East Boston Greenway Connector is a 0.5-mile pedestrian and bicycle path connecting Bremen Street Park to an overlook at Wood Island Marsh. The connector provides pedestrian access to the MBTA Blue Line Wood Island Station and is part of the Mary Ellen Welch Greenway.	
8	**Narrow-Gauge Connector (2016)**	
	The City of Boston constructed the Narrow-Gauge Connector, a third-mile extension of the Mary Ellen Welch Greenway, between Wood Island Marsh and Constitution Beach. Ownership, maintenance, and security of the project were handed over to Massport upon completion.	
9	**Bayswater Embankment Airport Edge Buffer (2003)**	
	The Bayswater Street Airport Edge Buffer project, completed in 2003, established a landscaped barrier between Bayswater Street and Boston Harbor. This community-involved project features a park with marine-tolerant landscaping and historic streetlights. Massport is currently working on repairing recent shoreline storm damage, and an Expanded Environmental Notification Form (EENF) was filed with MEPA in December 2023.	

Source: Massport.
Note: See Figure 2-3 for the location of Airport edge buffer projects and planning concepts.

2.3 Community and Environmental Justice Outreach

Massport has demonstrated a consistent commitment to engaging with nearby communities and enhancing the quality of life of Massport's neighbors. This commitment is carried out by Massport's Community Relations & Government Affairs Department and the Massport CAC. This section outlines Massport's public outreach practices, including its comprehensive EJ and translation policies. These practices inform the Authority's strategy across both specific projects and broader filings such as EDRs and ESPRs. Included are specific measures taken for public involvement to ensure thorough, inclusive, and accessible communication. Additionally, this section highlights Massport's continued evolution in its approach to community engagement, with recent expansions in outreach efforts and the addition of pre-filing public information sessions for projects in the MEPA process.

2.3.1 Regulatory Framework

The Climate Roadmap Act (2021) defines EJ principles, the characteristics of EJ populations, environmental benefits and burdens experienced by EJ communities, and the potential impacts. The *Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs*[14] (2021 EJ Policy), originally issued in 2002 and updated on June 24, 2021, incorporates the definitions from the Climate Roadmap Act and reinforces an inclusive community involvement in the environmental decision-making process. The 2021 EJ Policy builds upon federal guidelines under Executive Order 12898 and Executive Order 14008.

The EEA has developed further guidance to implement the requirements outlined in the Climate Roadmap Act and 2021 EJ Policy. The EEA enacted the *MEPA Public Involvement Protocol for Environmental Justice Populations*[15] and the *MEPA Interim Protocol for Analysis of Project Impacts on Environmental Justice Populations*[16] on January 1, 2022 (2022 EJ Protocols). The 2022 EJ Protocols require environmental notification forms (ENFs) and expanded ENFs (EENFs) filed with the MEPA Office to identify EJ populations within a 1-mile radius and a 5-mile radius of the Project Area, using the Massachusetts 2020 Environmental Justice Populations mapping tool (EJ Maps Viewer) and associated data layers. The 2022 EJ Protocols also outline subsequent impact analysis and outreach requirements. Logan Airport is located within and adjacent to census tract block groups identified by the EJ Maps Viewer as EJ populations.

Massport will comply with these amended regulations and protocols for individual projects at Logan Airport filed with MEPA. While Massport's EDR and ESPR filings are not formally subject to these new regulations and protocols, as they are not projects, the Secretary of the EEA's Certificate reflects robust community engagement that meets the spirit of the 2021 EJ Policy and 2022 EJ Protocols, and as such,

14 EEA. 2021. Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs. https://www.mass.gov/doc/environmental-justice-policy6242021-update/download.

15 EEA. 2022. MEPA Public Involvement Protocol for Environmental Justice Populations. https://www.mass.gov/doc/final-mepa-public-involvement-protocol-for-environmental-justice-populations-effective-date-of-january-1-2022/download.

16 EEA. 2022. MEPA Interim Protocol for Analysis of Project Impacts on Environmental Justice Populations. https://www.mass.gov/doc/final-mepa-interim-protocol-for-analysis-of-project-impacts-on-environmental-justice-populations-effective-date-of-january-1-2022/download.

Massport is voluntarily complying with these new protocols. See Section 2.4, Section 2.5, and Section 2.6 for an EJ and public health existing conditions reviews for additional content in accordance with the 2021 EJ Policy and 2022 EJ Protocols.

2.3.2 Massport's History of Community Outreach

Massport has and continues to conduct comprehensive outreach to the surrounding communities through its Community Relations & Government Affairs Department. Additionally, Massport relies on input from the Massport CAC to act as a government representative for the 35 communities surrounding Massport facilities.

2.3.2.1 Massport Community Relations and Government Affairs

Massport's Community Relations & Government Affairs Department manages Massport's relations with community members and government officials and furthers Massport's goal of being a good neighbor. The department implements Massport's public engagement practices, which are tailored on a project-by-project basis per community needs and for the annual EDRs and ESPRs. Section 2.3.3 provides general information on Massport-wide public involvement and EJ engagement practices, which are refined for each Massport project or initiative.

2.3.2.2 Massport Community Advisory Committee

The Massport CAC (https://massportcac.org/) was established in 2014 to represent the interests of communities impacted by Massport's operations and functions as a government agency in the Commonwealth of Massachusetts. The Massport CAC provides a collective voice for 35 communities through advocacy, informing, liaising, and oversight. Massport receives input from the Massport CAC, which builds a strong relationship of continued collaboration and cooperation. As the Massport CAC functions as a government agency, it is subject to the Open Meeting Law, which means Massport CAC meetings are open to the public either during the meeting, through in-person or remote participation, or after the close of the meeting, through a recording or transmission, and meetings are announced with enough notice for the public to reasonably be able to attend.

2.3.3 Project-Specific Massport Public Involvement Practices

The Community Relations and Government Affairs Department directs Massport's EJ and community outreach for projects subject to MEPA review. Massport identifies EJ block groups within a 1-mile radius and 5-mile radius[17] of a Project Area as part of the MEPA project filings for projects occurring after the 2021 EJ Policy and 2022 EJ Protocols were enacted.

17 EJ populations within 5 miles of standard individual projects undergoing MEPA review are typically depicted in a figure, while EJ populations within 1 mile are detailed in a table and analyzed for disproportionate adverse effects. If the project exceeds an air quality threshold, the project is subject to a disproportionate adverse effects analysis for all EJ populations within 5 miles.

Massport translates and publishes key written project materials and public notices in other languages if the EJ Maps Viewer identifies a language is spoken by 5 percent or more of the census tracts within the DGA.[18] If 10 percent or more of the community speak the same non-English language and do not speak English well or at all, oral interpretation services are provided during public meetings and outreach activities. Massport offers additional language access services by request. When surrounding non-English speaking communities may be affected, but do not meet the 5 percent threshold, Massport publishes a call for translation requests, or Babel notice, in the languages commonly spoken in the surrounding communities with information on how to submit such requests.

The following measures are consistently applied to project-specific MEPA filings and constitute Massport's public involvement plan on an Authority-wide basis:

- Identify a team to coordinate and facilitate EJ and community outreach for the project, including effective communication with EJ stakeholders.
- Request an EJ Reference List from MEPA-EJ@mass.gov for each project that falls under MEPA review.
- Circulate a link to the filing electronically to the EJ Reference List, government officials, persons or entities who previously commented on past filings for the project, and other identified stakeholders.
- Distribute hard copies of filing documents to local libraries for ease of public access.
- Post public notices to Massport's website: https://www.massport.com/massport/community/public-notices/.
- Publish project information on Massport's website: https://www.massport.com/massport/community/ongoing-projects/.
- Post the public notice and filing notification on social media sites.
- Publish the public notice in relevant local print media, including non-English and community-specific media outlets and local newspapers, such as *Boston Herald*, *East Boston Times*, *Winthrop Transcript*, and *El Mundo*.
- Translate public notices and project summaries (or Executive Summaries) into languages spoken by at least 5 percent of the census tract's population who do not speak English very well or at all.
- Include a reference, or Babel notice, to public notices and certain filing materials that project, and meeting materials are available in other languages, upon request.
- Provide language interpretation services for languages spoken by at least 10 percent of the census tract's population who do not speak English very well or at all.
- Enable public meeting participation in-person, virtually, or by phone to accommodate those with limited technology or transit access.
- Schedule public meetings outside the standard workday for accessibility.

18 See the languages spoken layer at https://mass-eoeea.maps.arcgis.com/apps/MapSeries/index.html?appid=535e4419dc0545be980545a0eeaf9b53.

- Identify additional methods to reach EJ communities with limited technology access, as feasible, such as paper mailers instead of email communication in translated languages, alternative paper feedback forms, and one-page flyers for distribution at locations that are frequented by EJ populations.
- In addition to online repositories, identify additional traditional and non-traditional information repositories, such as houses of worship, community centers, and others, as appropriate.
- Hold pre-filing meetings as feasible, including technical review meetings.
- Provide pre-meeting discussions with key stakeholders to incorporate important topics and expressed concerns into public meetings.
- Offer smaller meetings with key stakeholders and community groups prior to filings, as feasible or upon request.

2.3.4 EDR and ESPR Public Involvement Practices

While EDRs and ESPRs are not project-specific filings, Massport still applies the public involvement practices listed in Section 2.3.3.

Per the Secretary's Certificate on the *2020/2021 EDR* for the *2022 ESPR*, for the EDR/ESPR process, Massport has expanded EJ outreach and the subsequent EJ Reference List to EJ populations within 5 miles, in languages spoken by at least 5 percent of the census tract's population who do not speak English very well or at all within 5 miles of Logan Airport as well as within Massport CAC communities (Appendix A, *MEPA Certificates and Responses to Comments*). A map of the EJ populations within a 1- and 5-mile radius can be found in **Figure 2-4**. In response to the Secretary's Certificate, and based on past EDR, ESPR, and Authority-wide public involvement practices, the measures listed in Section 2.3.3 have and will continue to be implemented for this and future EDR and ESPR filings, unless defined otherwise by MEPA.

Massport supplemented its existing EDR and ESPR public involvement practices by holding additional pre-filing public information sessions. The initial *2022 ESPR* public information session was held on June 26, 2023, to present the technical analysis methodology. A second pre-filing public session was held on January 17, 2024, and presented an update on the progress and preliminary findings of the *2022 ESPR*. The history of outreach prior to this filing is in Appendix E, **Table E-1**. Copies of the materials presented in these meetings are in Appendix E, Section E.2.1.

This *2022 ESPR* includes format changes that enhance the readability of the document including additional graphics, shorter sections, greater use of simpler language, and use of Appendices for technical information.

This ESPR, like previous Massport EDR and ESPR filings, voluntarily offers an extension to the typical MEPA 30-day public comment period.

As requested in the Secretary's Certificate, **Table 2-5** provides a list of languages spoken by more than 5 percent of a population who "do not speak English well or at all," within 5 miles of Logan Airport and within the 35 Massport Community Advisory Committee (Massport CAC) communities (See Appendix A, *MEPA Certificates and Responses to Comments*). The table also denotes how Massport incorporated these languages into the EJ and community outreach strategy.

The ESPR's Chapter 1, *Introduction and Executive Summary*, is translated into Spanish, Portuguese, Simplified Chinese, and Haitian Creole, as specified by MEPA for the "French Creole" language designation that exceeded the 5 percent threshold. The Spanish translation of Chapter 1 is included in all printed copies. Spanish, Portuguese, Simplified Chinese, and Haitian Creole translations are available electronically via links to Massport's website and are available in print at local libraries (see Appendix D, *Distribution List*, for a list of the libraries that receive a copy). Massport intends to follow this translation approach for future public notices and summaries. In addition, Massport provided a Babel Notice for five additional languages. A Babel Notice informs readers, in English and other languages, how to access language translation services and how to request project materials in a specific language. The languages Massport included in the Babel Notice for the *2022 ESPR* are Vietnamese, Russian, Mon-Khmer, Arabic, and Korean. Massport offered interpretation services for Spanish, and additional languages upon request.

Table 2-5 Massport Enhanced Language Access

Massport Expanded Outreach	Languages Spoken by Greater Than 5% of Population within DGA							
	Spanish	Portuguese	Simplified Chinese	Haitian Creole	Vietnamese	Russian	Mon-Khmer	Arabic
Notification of Availability								
Full Translation	X	X	X	X				
Babel Notice					X	X	X	X
Chapter 1, Introduction and Executive Summary								
Full translation	X	X[1]	X[1]	X[1]				
Email Filing Notification								
Full Translation	X	X	X	X				
Babel Notice					X	X	X	X
Public Meetings								
Full Translation	X	X	X	X				
Babel Notice					X	X	X	X
Interpreter Provided	X							

1 Available electronically on Massport's website and at local libraries (see Appendix D, *Distribution List*).

2.4 Environmental Justice Existing Conditions Review

The Secretary's Certificate for the *2020/2021 EDR* requested that Massport "identify [EJ] populations within 5 miles of the Airport including languages spoken by those who identify as not speaking English very well" toward efforts of expanding public outreach, specifically to EJ populations (see Appendix A). Since the issuance of the *2020/2021 EDR* Secretary's Certificate and subsequent meetings with the MEPA Office and advocacy group meetings during the *2022 ESPR's* development, the MEPA Office requested Massport include a public health existing conditions review for communities surrounding Logan Airport (see Section 2.5) in the *2022 ESPR*. Massport is voluntarily conducting a public health existing conditions review for communities surrounding Logan Airport, with a focus on EJ communities.

The following section summarizes the EJ existing conditions review conducted in response to the Secretary's Certificate and voluntary review of existing public health conditions. Additional information is provided in Appendix E, Section E.3.

2.4.1 Environmental Justice Regulatory Context

As described in Section 2.3.1, the 2022 EJ Protocols require ENFs and EENFs for projects filed with the MEPA Office to identify EJ populations within 1 and 5 miles of a Project Area using the EJ Maps Viewer. Massport is the only agency in the state that prepares ESPR and EDR documents, reports on environmental conditions, discloses plans to inform the public, and describes facility cumulative impacts. The ESPRs and EDRs support but do not advance specific projects subject to MEPA review.

To identify EJ communities in the vicinity of Logan Airport, Massport used 2020 U.S. Census American Community Survey (ACS) data and applied the EJ criteria from the 2021 EJ Policy, where populations exhibited the following characteristics:

- The annual median household income is no more than 65 percent of the statewide annual median household income;
  - The statewide median household income matching the dataset timeframe (2016-2020) in Massachusetts is $84,385,[19] and 65 percent of this amounts to $54,850.25;
- Minorities comprise 40 percent or more of the population;
- English language proficiency is lacking among 25 percent or more of households; or
- Minorities comprise 25 percent or more of the population, and the annual median household income of the municipality in which the neighborhood is located does not exceed 150 percent of the statewide annual median household income.

19 U.S. Census Bureau. 2016-2020 ACS 5-Year Estimates.

2.4.2 Environmental Justice Existing Conditions Review Methodology

The EJ existing conditions review uses EEA's EJ Maps Viewer, which includes ACS block group data and publicly available EJ criteria data, within a DGA of a 1-mile radius from the Logan Airport boundary. EJ block groups within 1 mile are summarized in Section 2.4.3 and tabulated in Appendix E, **Table E-3**. EJ block groups within 5 miles are depicted in **Figure 2-4**. A more expanded methodology and discussion of data availability limitations can be found in Appendix E, Section E.3.1.

2.4.3 Environmental Justice Populations

Within the Logan Airport DGA are 64 EJ block groups, of which 32 meet the minority EJ criteria; three meet the low-income EJ criteria; seven meet both the minority and low-income EJ criteria; 14 meet both the minority and English isolation EJ criteria; and eight meet the minority, low-income, and English isolation EJ criteria. See Section 2.4.1 for criteria thresholds per the 2021 EJ Policy. See Appendix E, **Table E-3** for a more detailed breakdown of EJ block group characteristics within 1 mile, and **Figure 2-4** for EJ block groups within 5 miles of Logan Airport.

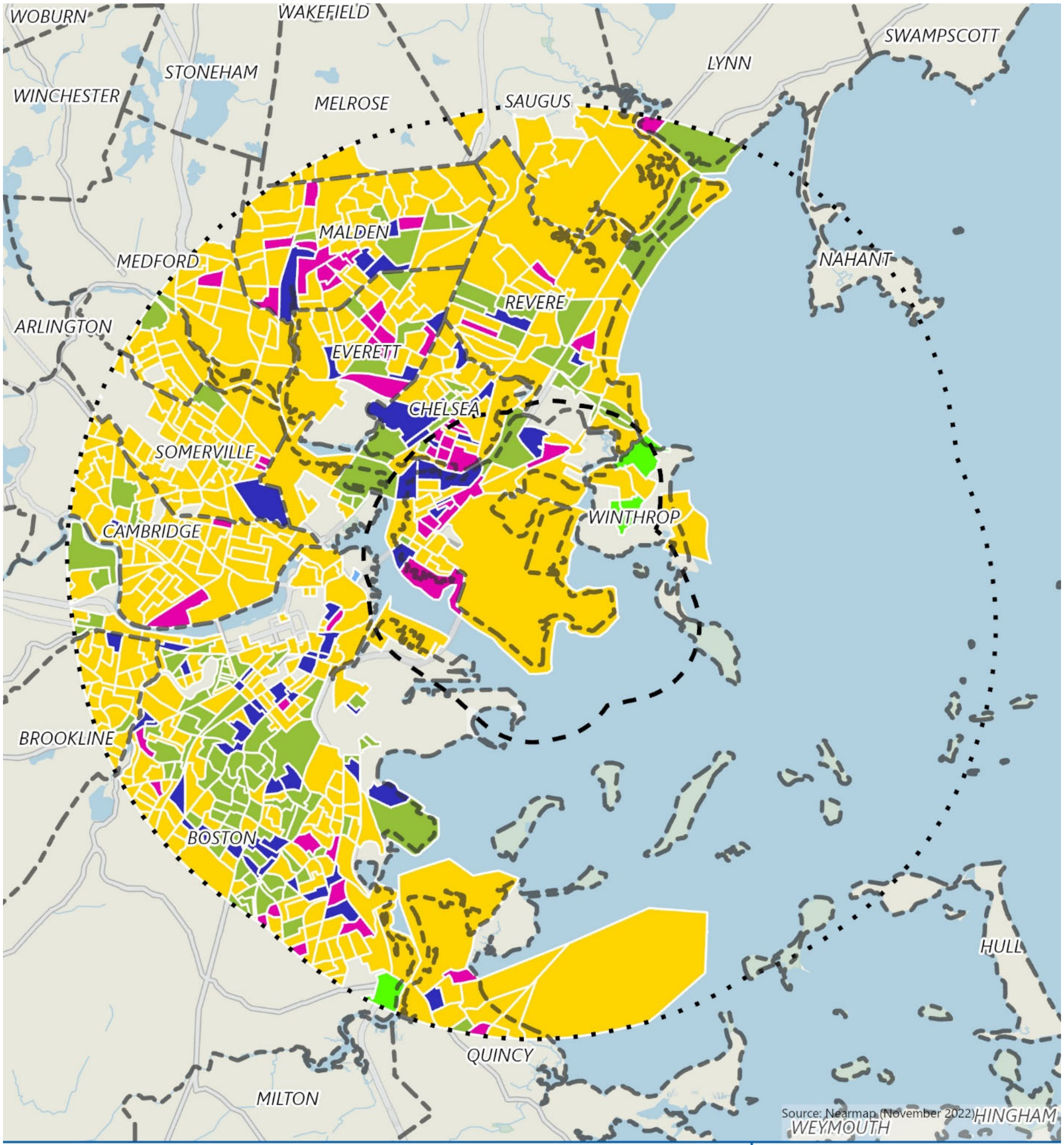
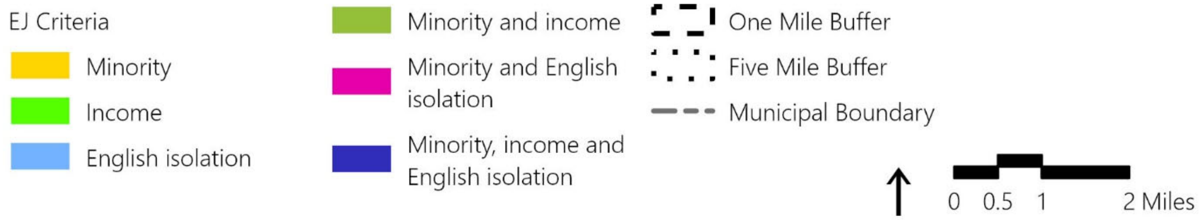


Figure 2-4 EJ Populations within 1 and 5 miles of Logan Airport

2022 Environmental Status and Planning Report



2.5 Public Health Existing Conditions Review

The following section summarizes the public health existing conditions review conducted in response to the MEPA Office's request, subsequent to the issuance of the Certificate on the *2020/2021 EDR*. This section includes a review of the Massachusetts Department of Public Health (DPH) Environmental Justice Tool (DPH EJ Tool) Vulnerable Health EJ Criteria, potential pollution sources, and U.S. Environmental Protection Agency's (U.S.EPA's) EJScreen EJ Indexes used to assess existing population health and surrounding environmental conditions for the communities (including EJ populations) within 1 mile of Logan Airport. The municipalities within the DGA included in this existing conditions review are Boston, Chelsea, Revere, and Winthrop.

This review was conducted to identify existing environmental burdens[20] and related public health consequences[21] experienced by communities surrounding Logan Airport. Tools used for the existing conditions review are approved by MEPA and are included in the 2022 EJ Protocols. However, a caveat on the tools used for this existing conditions review is the tools are unable to differentiate Logan Airport-related activities from other surrounding activities and site uses. When Massport can differentiate airport impacts from those derived from other sources, the impacts and associated offsets are reported in the respective ESPR chapters. Future ESPRs will provide updates on public health existing conditions, as data are available.

2.5.1 Public Health Regulatory Context

Since the issuance of the *2020/2021 EDR* Secretary's Certificate and follow-up meetings with the MEPA Office and advocacy groups during the ESPR's development, the MEPA Office has requested that Massport utilize the DPH EJ Tool to further understand existing health conditions the communities surrounding Logan Airport may experience. In addition to the request and as part of its commitment to sharing information with regulators and the community, Massport has voluntarily conducted an EJ and public health existing conditions review within a 1-mile radius of Logan Airport in this *2022 ESPR*. See Section 2.5.2 for more information on components of the public health existing conditions review methodology.

20 Environmental burdens are defined by EEA as "any destruction, damage, or impairment of natural resources that is not insignificant, resulting from intentional or reasonably foreseeable causes, including but not limited to climate change, air pollution, water pollution, improper sewage disposal, dumping of solid wastes and other noxious substances, excessive noise, activities that limit access to natural resources and constructed outdoor recreational facilities and venues, inadequate remediation of pollution, reduction of ground water levels, impairment of water quality, increased flooding or storm water flows, and damage to inland waterways and waterbodies, wetlands, marine shores and waters, forests, open spaces, and playgrounds from private industrial, commercial or government operations or other activity that contaminates or alters the quality of the environment and poses a risk to public health."

21 A public health consequence is designated by a rate of occurrence greater than 110 percent of the statewide rate of occurrence for DPH EJ Tool Vulnerable Health EJ Criteria data.

2.5.2 Public Health Existing Conditions Review Methodology

The public health existing conditions review uses the DPH EJ Tool,[22] and the U.S.EPA's EJScreen Tool.[23] These are all publicly available data, but are not at a level of detail that demonstrates Logan Airport-specific activity. The public health existing conditions review uses the same 1-mile radius as the DGA for the EJ existing conditions review.

The DPH EJ Tool was used to identify potential sources of pollution that may have affected, or may currently affect, communities, including EJ populations, within 1 mile of Logan Airport based on Vulnerable Health EJ Criteria.[24] Scientific research has shown these criteria, and the health conditions they represent, to be correlated with environmental pollution generally associated with certain industrial and commercial activities. The elevated blood lead and low birth weight Vulnerable Health EJ Criteria are available at the census tract level, while heart attack and pediatric asthma Vulnerable Health EJ Criteria are currently available at the municipality level. An associated health consequence of a Vulnerable Health EJ Criterion is designated by a rate of occurrence greater than 110 percent of the statewide rate of occurrence.

The DPH EJ Tool was also utilized to identify off-Airport sites classified by MEPA as potential pollution sources within 1 mile of Logan Airport. The activities associated with these facilities may contribute to Vulnerable Heath EJ Criteria rates of occurrence and associated consequences, as well as other adverse health and environmental conditions.

EJScreen EJ Indexes are a series of 13 environmental indicators that quantify a DGA's populations' risk as a percentile compared to state and national averages. Per the 2022 EJ Protocols, DGAs with an EJScreen environmental indicator value greater than or equal to the 80^{th} percentile designate a heightened risk of burden or an existing health consequence. Percentiles are useful for comparison purposes and risk identification, but may not exactly portray burdens actively experienced by a community.

Table 2-6 summarizes the three types of public health data in the public health existing conditions review.

22 View at: https://matracking.ehs.state.ma.us/Environmental-Data/ej-vulnerable-health/environmental-justice.html#MyPopup.

23 View at: https://ejscreen.epa.gov/mapper/.

24 At the time of filing the 2022 ESPR, the DPH vulnerable health EJ criteria were in the process of being updated to 2020 census tract boundaries. These are best available data at the time of filing, but may not directly align with EJ and EJScreen data that are based on 2020 boundaries.

Table 2-6 Related Public Health Data

Pollutant Type	Related Potential Sources of Pollution	Related EJScreen Environmental Justice Indexes	Related Vulnerable Health EJ Criteria
Exposure to Air Pollution	• Large quantity toxic users • Large quantity generators • Facilities with air operating permits • Proximity to roadways • Airport infrastructure • Non-electric rail infrastructure • Power plants • Construction activities	• Particulate Matter • Ozone • Diesel Particulate Matter • Air Toxics Cancer Risk • Air Toxics Respiratory HI • Toxic Releases to Air • Traffic Proximity	• Heart Attack • Low Birth Weight • Pediatric Asthma
Exposure to Water and Soil Pollution	• Lead Paint (housing) • Water distribution pipes • M.G.L. c. 21E sites • Tier II toxics use reporting facilities • Sites with Activity and Use Limitations (AULs) • Leaking underground storage tanks (USTs) • Toxic Release Inventory (TRI) facilities	• Lead Paint • Superfund Proximity • Risk Management Plan (RMP) Facility Proximity • Hazardous Waste Proximity • Underground Storage Tanks • Wastewater Discharge	• Elevated Blood Lead

Source: DPH, Environmental Public Health Tracking and Data, 2022.

2.5.3 DPH EJ Tool – Vulnerable Health EJ Criteria Existing Conditions Review

Within the DGA, 15 census tracts containing 13 EJ block groups exhibit existing blood lead levels greater than 110 percent of the statewide rate. In addition, the data shows that 10 census tracts, including seven EJ block groups, currently experience greater rates of low birth weight than 110 percent of the statewide rate. Appendix E, **Table E-3** provides a breakdown of these occurrences by census tract and denotes if an EJ block group is present within the census tract.

It is important to note that while populations in the DGA may be experiencing some or all of these negative effects, the pollution sources and relative contributions from those sources cannot be distinguished from each other using these tools. Also, some of the pollutants described in **Table 2-6** are not associated with aviation or airport activities. For example, lead exposure in the context of the DPH EJ Tool primarily derives from sources in the home, such as exposure to lead paint or lead in other building materials, or from antiquated potable water infrastructure. Therefore, the associated Vulnerable Health EJ criteria for issues associated with lead exposure are not associated with airports or aviation activities. Additionally, pollutants related to the Vulnerable Health EJ Criteria have been shown in scientific literature to be associated with a wide variety of transportation, manufacturing, construction, and other industrial activities, all of which occur in the areas surrounding Logan Airport, but these cannot be differentiated from one another or specifically attributed to a single source on the municipality scale.

At the municipality level, the DPH EJ Tool indicates that Boston meets the Vulnerable Health EJ criteria for low birth weight and pediatric asthma, but not for heart attack or elevated blood lead, and contains EJ block groups within the DGA. The Chelsea meets the Vulnerable Health EJ criteria for heart attack, elevated blood lead, low birth weight, and pediatric asthma, and contains EJ block groups within the DGA. The Revere does not meet any of the Vulnerable Health EJ criteria, and contains EJ block groups within the DGA. The Town of Winthrop meets the Vulnerable Health EJ criteria for elevated blood lead, but not for heart attack, low birth weight, or elevated blood lead, and contains EJ block groups within the DGA.

2.5.4 DPH EJ Tool – Potential Sources of Pollution Existing Conditions Review

While this public health existing conditions review including EJ populations provides a comprehensive list of facilities with routine activities or incidents that have been correlated with the potential for contributing to adverse environmental conditions and associated health effects, this existing conditions review cannot determine which of these facilities may or may not be specific contributors to the existing health or environmental conditions experienced by populations within the DGA. The number of facilities in the DGA for each applicable DPH classification category, including facilities on Logan Airport's campus, and a summary of site uses are provided in **Table 2-7.** The individual facility names within each category are provided Appendix E, Section E.4.2 for reference.

Table 2-7 MEPA Classified Facilities within the DGA

DPH Classification Category	Site Count	Site Uses
Major Air and Waste Facilities (large quantity toxic users, large quantity generators, air operating permits)[1]	49	• Commercial shipping • Surface, air, and water transportation • Fueling • Consumer goods • Pharmaceuticals
MassDEP Tier Classified 21E Sites	27	• Commercial shipping • Surface, air, and water transportation • Fueling • Automobile and machinery servicing • Municipal uses

Table 2-7 MEPA Classified Facilities within the DGA

DPH Classification Category	Site Count	Site Uses
Tier II Facilities	52	• Commercial shipping • Surface, air, and water transportation • Fueling and Energy • Consumer Goods • Telecommunication • Medical and Pharmaceuticals • Municipal uses
MassDEP Sites with Activity and Use Limitations (AULs)	81	• Surface, air, and water transportation • Fueling and Utilities • Automobile and machinery servicing • Municipal uses
MassDEP Groundwater Discharge Permits	0	• N/A
Wastewater Treatment Plants	10	• Wastewater treatment
Underground Storage Tanks (USTs)	60	• Surface, air, and water transportation • Fueling • Automobile and machinery servicing • Entertainment and Hospitality
U.S.EPA facilities (Toxic Release Inventory)[1]	3 (21 incidents)	• Commercial shipping • Fueling and Energy
Power Plants	2	• Consumer Goods • Medical and Pharmaceuticals

Source: DPH EJ Tool.

1 These potential sources of pollution categories contain additional data layers that are not listed due to a count of 0 sites.

2.5.5 EJScreen Community Existing Conditions Review

As part of this public health existing conditions review, Massport used the U.S.EPA's EJScreen tool to obtain percentile ranking comparisons by census block group to statewide and national averages, respectively, for 13 EJ Indexes. The Community Report generated by EJScreen (see Appendix E, Section E.4.4) provided percentiles of EJ Indexes within the DGA.

The following EJ Indexes are above the 80th percentile of the statewide and/or national average for the Project Buffer Area, signifying a potential existing environmental burden[25] for the area's EJ populations (see Table E-5 for the DGA index values and percentiles compared to state and national values, and Appendix E, Section E.4.3 for more information on the exceeded indexes):

Index related to air pollution:

- Diesel Particulate Matter (PM)
- Toxic Releases to Air
- Traffic Proximity

Index related to water and soil pollution:

- Lead Paint
- Risk Management Plan (RMP) Proximity
- Hazardous Waste Proximity
- Wastewater Discharge Indicator

2.6 Existing Conditions Review Conclusions

Both EJ and non-EJ populations within the DGA meet the Vulnerable Health EJ Criteria as established by EEA's 2021 EJ Policy and 2022 EJ Protocols, determined using the DPH EJ Tool and U.S.EPA's EJScreen. Per this public health existing conditions review, which used publicly available and validated data from government sources, both EJ and non-EJ populations within the DGA likely experience health consequences based on these populations meeting the Vulnerable Health EJ Criteria. Some of these datasets are not available on a census tract-level, and specific communities within the DGA itself may or may not experience health consequences associated with the Vulnerable Health EJ Criteria thresholds; however, this public health existing conditions review still acknowledges the probability that these public health consequences are experienced by EJ and non-EJ populations within the DGA. The findings of the public health existing conditions review are typical for a DGA centered around Boston and are consistent with typical sources of pollution that metropolitan areas across the State and U.S produce and experience.

The Vulnerable Health EJ Criteria met include heart attack, pediatric asthma, low birth weight, and elevated blood lead levels, which are correlated in the scientific literature with exposure to pollutants in air, potable water supplies, and soil or groundwater, as well as exposure to excessive noise levels. EJScreen indicates that diesel PM, toxic releases to air, traffic proximity, lead paint, RMP proximity, hazardous waste proximity, and wastewater discharge EJ Indexes are categorized as an environmental and health consequence when compared to the State or the U.S due to an 80th percentile or greater. Diesel PM, toxic releases to air, and traffic proximity may contribute to the low-birth-weight burden; while household lead paint, outdated water distribution systems, RMP proximity, and hazardous waste proximity may contribute to the elevated blood lead burden.

These pollutants have been shown in scientific literature to be associated with transportation, manufacturing, construction, and other industrial activities. Some types of facilities where these activities

25 U.S. EPA. Overview of Environmental Indicators in EJScreen. https://www.epa.gov/ejscreen/overview-environmental-indicators-ejscreen.

occur, or source areas, include pharmaceutical manufacturing facilities, factories, roadways, active construction sites, railyards, ports and shipping facilities, and airports.

While Logan Airport activities and operations might be a potentially contributing source of some of these forms of pollution, Logan Airport is not a primary source for lead exposure, which primarily comes from sources in the home or antiquated potable water infrastructure.

Currently, the scientifically validated data and technology needed to differentiate each of the pollution sources affecting these surrounding communities are not available. The scope and scale of source contributions cannot be directly quantified with the current technology available. Therefore, it is not possible at the time of filing this ESPR to accurately assess what effects are under its direct control to address or what actions could be taken that would have a meaningful effect.

3. Activity Levels and Forecasting

Air passenger activity and aircraft operations at Logan Airport are reported in **Environmental Status and Planning Reports (ESPRs)** and **Environmental Data Reports (EDRs)**, and provide input into operational and environmental analyses. Over the past several decades, even with increases in passengers and flights, most environmental measures have improved compared to historical conditions. This is primarily the result of cleaner and quieter aircraft, cars, trucks, and equipment; more efficient buildings and Airport operations; and continued efforts by Massport, the Federal Aviation Administration (FAA), and business partners to reduce the overall impact of Airport operations.

This chapter reviews current and recent trends in passenger levels; **aircraft operations**, or takeoffs and landings; and ground access modes, and then compares them to historical benchmarks. As discussed in this chapter, 2022 passenger levels and flight activity in the form of aircraft operations continued to recover from the historic lows experienced in 2020 due to the COVID-19 pandemic, though activity in 2022 did not surpass activity levels experienced in 2019.

This ESPR also presents an updated forecast for Logan Airport activities for the next 10- to 15-year **Future Planning Horizon**. In 2019, Logan Airport reached an all-time high of 42.5 million annual passengers (MAP) and the *2017 ESPR* looked at possible growth to 50 MAP. The *2022 ESPR* is based on a Future Planning Horizon of 53.5 MAP in the next 10 to 15 years as the basis for consideration of potential future operating and environmental conditions.

In reviewing past trends of Logan Airport activity, it is clear that the primary factors influencing activity are the regional and national economy, and international shocks to the aviation system such as the events of September 11, 2001, and the more recent COVID-19 pandemic. The updated forecast considers current and emerging trends in passenger travel and aviation technology, and given the data available, presents Massport's best estimate of how Logan Airport could evolve over the next 10 to 15 years.

Massport's unique ESPR process facilitates the regular reconsideration and updating of growth and activity trends as well as the ability to preview potential future environmental conditions. Specific projections of potential future conditions regarding air quality, noise, and ground transportation are presented in those individual chapters. Efforts to reduce those impacts are also discussed in the subject chapters as well as Chapter 10, *Project Mitigation*.

2022 Activity Levels Key Findings

The following details key findings of activity levels at the Airport in 2022:

- From 2014 to 2019, passenger levels grew by an average of 5.4 percent annually, and in 2022, Logan Airport was the 16th busiest U.S. airport by passenger count.
- Although Logan Airport reached an all-time high in passenger counts in 2019 at 42.5 million passengers, the impacts of the pandemic on the entire aviation transport system significantly reduced the Airport's passenger and flight operation activity levels.
- Logan Airport served 36.1 million passengers in 2022, which was roughly equivalent to its 2016 passenger count, but overall, Logan Airport's 2022 passenger activity levels were still about 15 percent below 2019 levels.
- In 2022, Logan Airport handled 378,613 aircraft operations, which is 11.4 percent less than the 427,176 aircraft operations seen in 2019, but 31.0 percent more than 2021 operations.
- On average, there were 132 passengers per aircraft operation in 2022, which more closely resembled the 2019 average of 130 passengers per aircraft operation.

Future Forecast Activity Levels Key Findings

In 2022, Logan Airport was the **16th busiest airport in the U.S**. by passenger count.

The methodology used for the activity forecasts considered the near-term rebound from the COVID-19 downturn and the return to longer-term growth trends in the airline industry. The process involved reviewing historical data, and analyzing recent developments and the future outlook of demand drivers like local and national economies. As discussed in Section 3.5.1, changes in Logan Airport activity are closely tied to local, regional, and national economic trends. The forecast methodology was developed in accordance with industry best practices, and the forecast analysis considered key trends in the regional economy, the national airline industry, COVID-19 recovery, and competition within the airline industry, among others. Outcomes from the activity forecast are used to inform model inputs for predicted future conditions over the Future Planning Horizon for on-airport vehicle use and traffic conditions, noise, and air emissions. **Table 3-1** provides a historical summary of aircraft operation and passenger activity levels in 2022 as well as the future forecast for operations and passengers over the Future Planning Horizon.

Table 3-1 Air Passengers and Aircraft Operations, 1990, 2019, 2021, 2022, and Future Planning Activity Levels (PAL)

Historical Activity Levels				
Year	**Air Passengers**	**Percentage Change from 2019**	**Aircraft Operations**	**Percentage Change from 2019**
1990	22,878,191	-	424,568	-
2019	42,522,411	-	427,175	-
2021	22,678,499	-46.7%	266,034	-37.7%
2022	36,090,716	-15.1%	378,613	-11.4%
Forecasts				
Year	**Air Passengers**	**Percentage Change from 2017**	**Aircraft Operations**	**Percentage Change from 2017**
Future PAL Forecast (2017)[1,3]	50,000,000	-	486,000	-
Future PAL Forecast (2022)[2,3]	53,500,000	7.0%	495,000	1.85%

1 Forecast prepared for *2017 ESPR*
2 Forecast prepared for *2022 ESPR*
3 Planning Activity Level (PAL): See Key Terminology Table

The following highlights some of the key findings for the Future Planning Horizon:

- Future passenger activity is anticipated to reach 53.5 million annual passengers in the next 10 to 15 years, as shown in **Table 3-1**. If realized, this would represent an increase of almost 26 percent compared to 2019.
- Future aircraft operations are anticipated to reach 495,000 annual operations in the next 10 to 15 years, as shown in **Table 3-1**. This is almost 16 percent greater than 2019, but below the 1998 historic peak[1] for operations. Projected aircraft operations are 2.0 percent greater for the *2022 ESPR* than what was estimated in the *2017 ESPR*.
- Annual future passengers in this *2022 ESPR* forecast are 7.0 percent greater than previous passenger forecast included in the *2017 ESPR*. These comparisons are shown in **Table 3-1.**

1 Historical data for passenger and air operations activity levels are provided in Appendix F, *Activity Levels Supporting Documentation*.

3.1 Passenger, Aircraft Operations, and Cargo Activity Levels in 2022

In 2022, Logan Airport and the aviation industry continued to recover from the impacts of the global COVID-19 pandemic. Before the pandemic, Greater Boston experienced strong passenger growth driven by favorable economic conditions, low unemployment, a diverse job market, and on-going investments in commercial and residential real estate, particularly in the fields of life sciences, finance, healthcare, and higher education.

At the beginning of the pandemic, airlines suspended many services to prioritize their networks and operations given imposed travel restrictions and the subsequent suppressed demand for air travel. Prior to the onset of COVID-19, air passengers and airlines had scheduled air travel they anticipated would occur at some point during the two years affected by the COVID-19 pandemic. Once the pandemic commenced, these travel plans may not have been permanently cancelled, but rather were postponed or deferred until the pandemic abated and travel restrictions were lifted. In 2021 when conditions began to permit a return to air travel, an unprecedented surge in travel demand was observed as a result of passengers trying to resume their deferred travel almost immediately. This emergent demand for air travel both benefited and strained the U.S. airline industry as airlines continued to manage route economics, **seat capacity**, and operations during this recovery period. The situation was further exacerbated as this emergent demand was in addition to the travel demand normally expected in a given year. On-going issues related to supply chains, labor shortages, new aircraft delivery delays, and fuel costs posed challenges for airlines at Logan Airport and across the national system.

Logan Airport is the principal airport for the Boston Metropolitan Area, and is an international and long-haul travel gateway for much of New England.

In 2022, the pandemic's decline and its overall impact on the aviation industry was marked by widespread vaccination and diminishing case numbers. As a result, international borders and foreign tourist markets gradually reopened. This shift triggered the return of Logan Airport's international traffic, which played a pivotal role in the Airport's recovery towards 2019 levels; in addition to domestic travel as it also rebounded. Passenger activity in 2022 mirrored levels observed in 2016, and Logan Airport is expected to return to 2019 activity levels by about 2025 as airlines continue to resume suspended services, expand destination offerings from Logan Airport, and find new opportunities to serve the market demand in the Greater Boston regional area. This section provides an update on the significant changes and the developing trends across the airline industry and at Logan Airport in 2022, and provides context for air transport performance levels relative to the pre-pandemic era in 2019.

3.1.1 Air Passenger Levels in 2022

Logan Airport was ranked the 16th busiest airport in the U.S. by passenger count in 2022[2] and served 36.0 million passengers, which was 13.4 million more passengers than in 2021. Air travel demand is strong and the U.S. aviation industry is approaching a new normal, given lifted COVID-19 restrictions and widespread vaccine availability. Logan Airport, however, has been recovering more slowly than the national average, with 2022 passenger counts still 15 percent less than in 2019.[3]

3.1.1.1 Logan Airport Passenger Markets 2022

In 2022, Logan Airport ranked 6th in the U.S. for transatlantic passengers, and approximately 4.1 million passengers flew to Europe, Africa, and the Middle East. As COVID-19 cases declined globally and vaccines became widely available in 2022, **international air travel** gradually resumed. This international travel rebound was primarily attributed to governments gradually lifting travel restrictions and quarantine requirements for foreign visitors to the U.S. As a result, 2022 transatlantic traffic at Logan Airport served nearly 4 million more international passengers than in 2021. Despite the rebound, transatlantic travel from Logan Airport to international destinations was still 17.6 percent less than in 2019. Comparatively, however, 2022 transatlantic passenger traffic nationwide was 19.2 percent less than in 2019, demonstrating Logan Airport's international travel demand is returning more rapidly than for airports nationally. These positive trends reflect the resilience and growth opportunities within Logan Airport's regional market.

Historically, factors contributing to increases in demand for air travel within Massachusetts and Greater Boston include:

- Economic growth and increased travel demand nationwide, particularly in leisure-oriented markets and business-related travel;
- Growth by airlines in response to local and national economic conditions, including jetBlue Airways, Delta Air Lines, and American Airlines at Logan Airport, along with emerging airline partnerships, which can expand service offerings and destinations;
- Introduction of new international destinations served by U.S. domestic and foreign carriers, which expands their respective route networks and increases travel appeal to a wider variety of potential customers; and
- Advancements in aircraft technology, including the introduction of longer-range aircraft equipped with fuel-efficient engines and new noise level reduction technologies.

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2 U.S. DOT T-100 database, latest international data available through December 2022.

3 U.S. DOT T-100 database.

However, additional challenges and potential economic obstacles may impede activity level growth at the Airport, including:

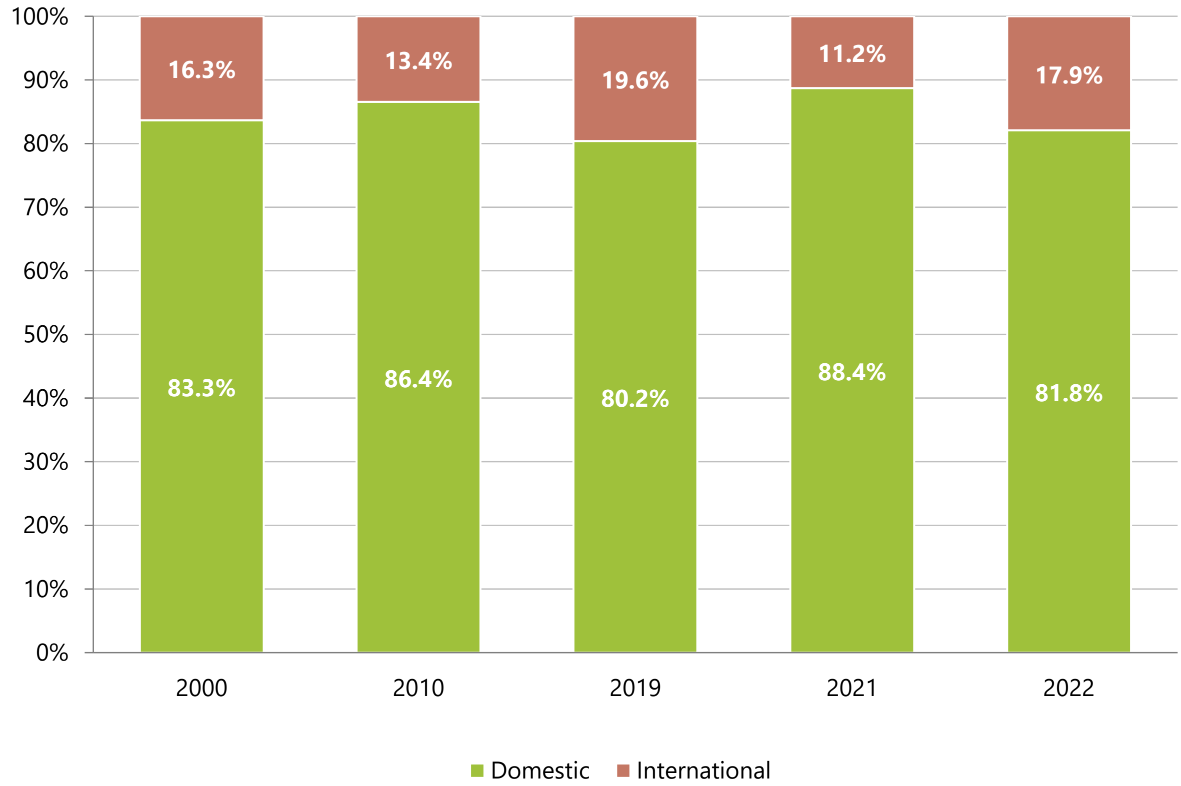
- Economic slowdowns or uncertainty in economic development activity at the state, regional, national, or international level;
- Airline labor supply constraints, especially for pilots, flight crew, and maintenance services, along with supply chain disruptions that could delay delivery of aircraft, goods, or materials;
- Air traffic control labor shortages or other staffing issues that could impact daily operations and efficiency;
- Fluctuating fuel prices, limited fuel availability, or changes in fuel service providers or suppliers that could affect operations or consumer airfare costs;
- Future business and corporate travel policy trends along with the evolving nature of business travel; and
- Regulatory challenges that impact airport and airline operations, growth, or airline consolidation or solvency.

At the beginning of the COVID-19 pandemic, air travel demand was suppressed by border closures; rigorous testing, quarantine, and vaccine documentation requirements; and reduced flight options. Strong domestic activity was driven by a resilient demand for leisure travel; particularly to destinations with outdoor recreational activities and desirable weather. **Domestic air travel**, in general, recovered faster than international air travel, which saw a slower rebound as foreign countries gradually eased entry requirements and restrictions on border crossings for travelers. In 2022, as borders reopened allowing for easier access to international markets, international air travel improved more quickly than in 2021. This was primarily due to widespread public vaccination, the aviation industry adoption of additional hygiene protocols, and passengers' demand to resume previously deferred trips.

As shown in **Table 3-2** and illustrated in **Figure 3-1**, the share of domestic air passengers in relation to total passengers in 2022 was higher than the share of total domestic passengers in 2019. Domestic passenger numbers increased by almost 9.5 million passengers between 2021 and 2022. However, domestic passenger levels at the end of 2022 remained almost 4.6 million passengers fewer than 2019 levels.

International passenger numbers increased substantially between 2021 and 2022 by an additional 3.9 million passengers, although this was still almost 1.8 million fewer passengers than 2019. At the end of 2022, as illustrated in **Figure 3-1**, the mix of international passenger and domestic passenger numbers was similar to the mix reported prior to the pandemic.

Figure 3-1 Domestic and International Commercial Passenger Market Share Distribution



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

Table 3-2 Air Passengers by Market Segment for 1990, 2000, 2010, 2019, 2021 and 2022

	1990	2000	2010	2019	2021	2022	Annual % Change (2021-2022)	2022 as % Above / Below 2019 Levels
Domestic	19,519,247	23,100,645	23,688,471	34,098,788	20,040,839	29,527,910	47.3%	-13.4%
International	3,358,944	4,513,192	3,681,739	8,317,993	2,549,976	6,450,000	152.9%	-22.5%
Europe / Middle East / Africa [1]	N/A	2,948,452	2,672,635	5,003,881	1,168,625	4,124,245	252.9%	-17.6%
Bermuda / Caribbean [2]	N/A	693,620	518,088	1,278,045	1,054,440	1,322,723	25.4%	+3.5%
Canada	N/A	833,669	486,911	985,051	142,088	602,835	324.3%	-38.8%
Asia / Pacific [3]	N/A	374,513	-	602,004	43,938	149,452	240.1%	-75.2%
Central / South America	N/A	-	4,105	449,012	140,885	250,745	78.0%	-44.2%
General Aviation	N/A	112,996	58,752	105,630	87,684	112,806	28.7%	+6.8%
Total Passengers	**22,878,191**	**27,726,833**	**27,428,962**	**42,522,411**	**22,678,499**	**36,090,716**	**59.1%**	**-15.1%**

Source: Massport.

Notes: Reported international passengers include only international passengers using Logan Airport as an international gateway; a significant number of international origin and destination (O&D) passengers also board domestic flights from Logan Airport to connect to other U.S. gateways to international destinations.

Average Annual Growth Rates calculate the Compound Annual Growth Rate (CAGR).

N/A indicates data was not available.

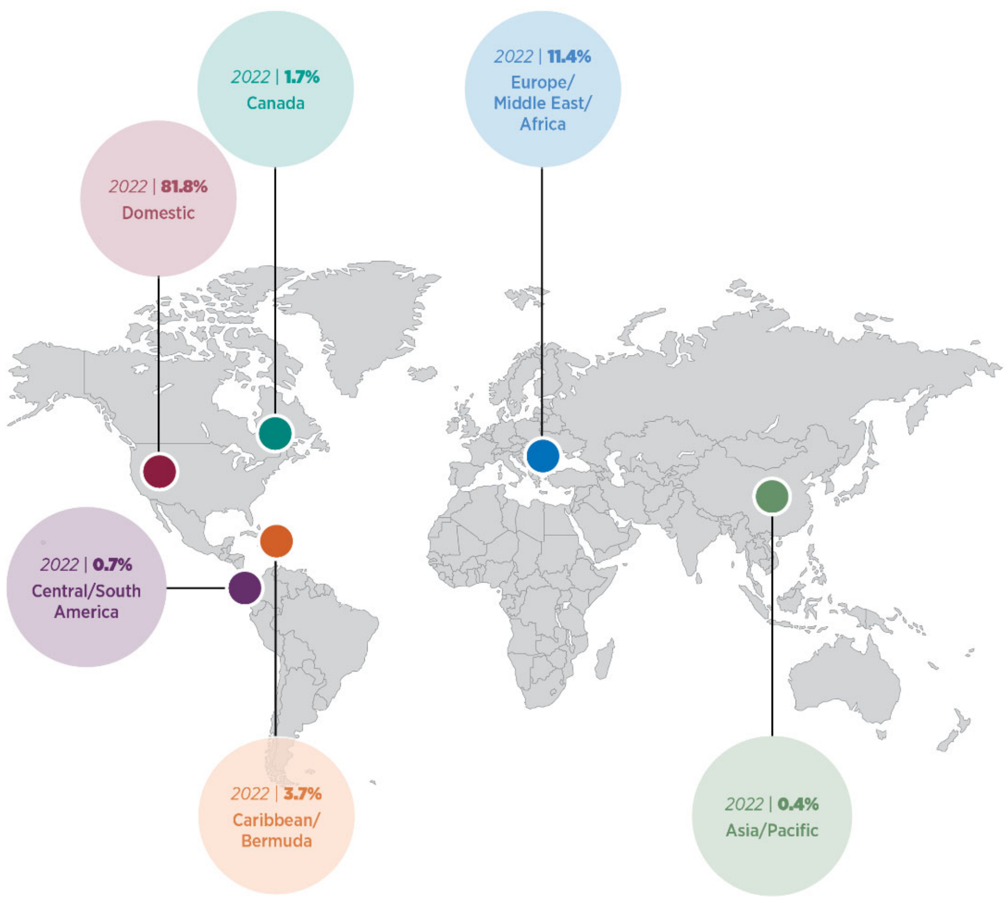
1 Royal Air Maroc (RAM), a Moroccan air carrier, commenced service to Casablanca, Morocco (North Africa) in June 2019. However, the carrier was not scheduled to return to service in 2022, although as of December 2021, online petitions had been circulating to "bring back" direct flights between Boston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

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

3 Between 1996 and 2001, Korean Air served Logan Airport with one-stop service via John F. Kennedy International Airport (JFK) in New York, NY or Washington Dulles International Airport (IAD) in Washington, DC. This service was discontinued in February 2001; however, starting in May 2019, Korean Air re-commenced service out of Boston with a direct connection to Seoul, Korea via Incheon International Airport (ICN), interchanging between their Boeing B787 Dreamliner and Boeing B777 aircraft.

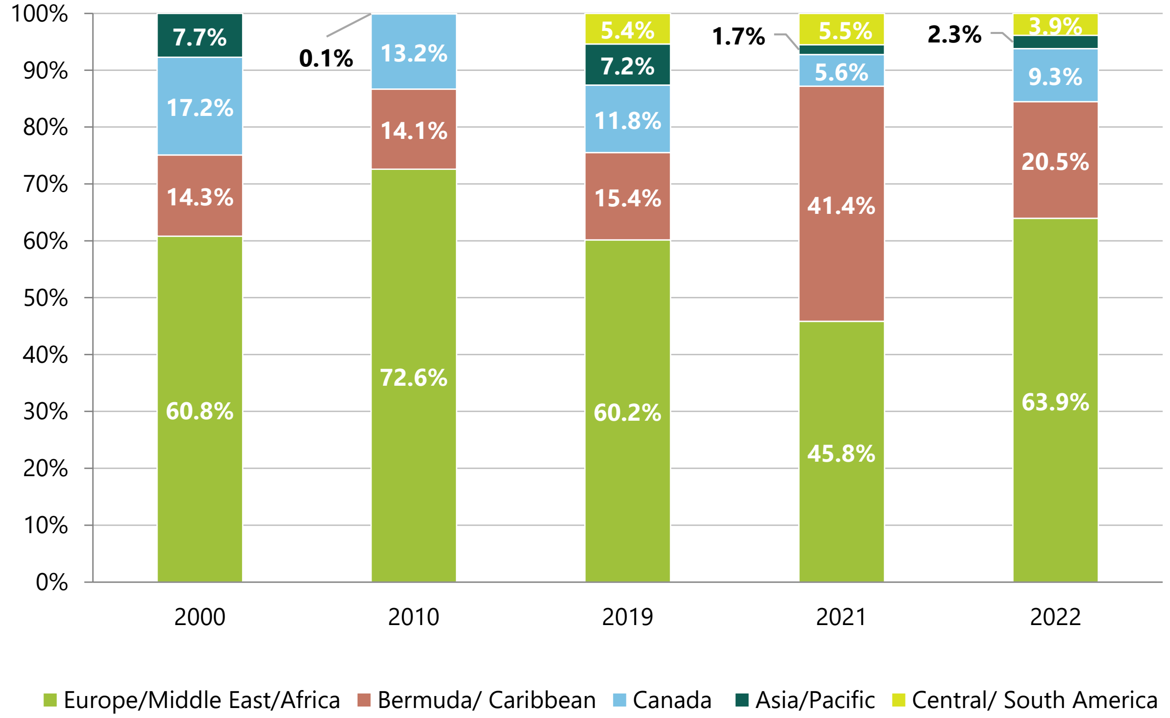
Figure 3-2 depicts the 2022 Logan Airport passenger distribution by market segment, and **Figure 3-3** illustrates the passenger destination distribution from 2000 to 2022. Between 2021 and 2022, the domestic passenger segment remained the largest share of total passengers, although the relative percentage declined 6.6 percent as international air travel volumes began to recover. The U.S. reopened its borders to fully vaccinated foreign visitors in November 2021, and by mid-June 2022, negative COVID-19 test results were no longer required for air arrivals to the U.S. In 2022, the transatlantic international segment, which includes flights to Europe, the Middle East, and Africa, remained the dominant market segment in terms of volume; accounting for 63.9 percent of total international air travel and 11.4 percent of total passenger traffic. The Bermuda and Caribbean market segment recorded the fastest return to previous passenger traffic levels among market segments between 2021 and 2022, as shown in **Table 3-1**. Bermuda and Caribbean market increased its share among total international air travel to 20.5 percent, compared to 15.4 percent in 2019.

Figure 3-2 Distribution of Logan Airport Passengers by Market Segment, 2022



Source: Massport
Note: General Aviation (GA) accounted for 0.3 percent of total Logan Airport passengers in 2022.

Figure 3-3 Logan Airport International Market Segment Passenger Distribution Over Time



3.1.1.2 2022 Passenger Service by Airline

Passenger commercial air service is provided by legacy carriers, such as American Airlines, Delta Airlines, and United Airways; **Low-Cost Carriers (LCCs)**, such as jetBlue Airways and Southwest Airlines; and **Ultra-Low-Cost Carriers (ULCCs)**, like Spirit Airlines. Each offers different levels of service and connectivity. Logan Airport is primarily an **Origin and Destination (O&D)** market, and as such is an important gateway for international air traffic.

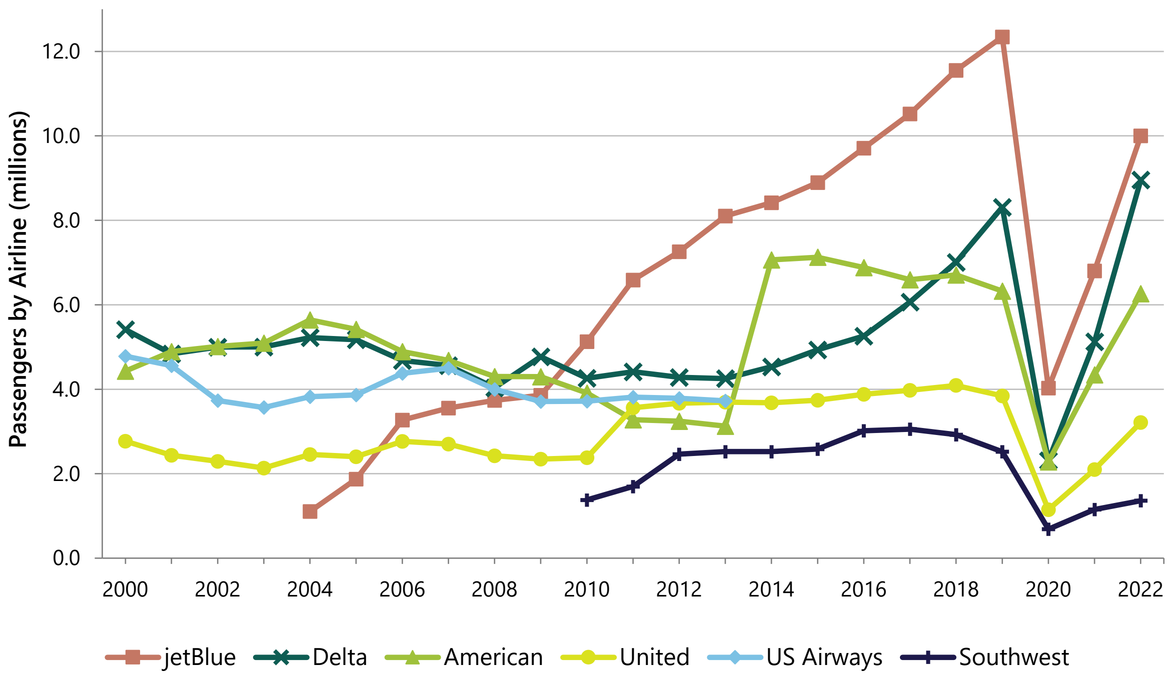
Figure 3-4 shows the annual passengers served by the six major airlines at Logan Airport. Overall, LCCs' passenger activity levels increased significantly at the Airport over the past decade, surpassing traffic volumes among legacy carriers at Logan Airport.[4] Since jetBlue Airways entered the market in 2004, the carrier has expanded and made Logan Airport one of its largest focus markets.

Logan Airport's strong air travel demand and market position, coupled with its emergence from the pandemic, makes it a strategic airport location for international expansion by jetBlue Airways, Delta Air Lines, and American Airlines, along with their partner airlines. New nonstop services introduced by

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

foreign airlines cater to O&D traffic and enable connecting opportunities through airline codeshares and interline agreements.[5,6] The Airport benefits from its O&D passenger market strengths, making Logan Airport an attractive entry point for foreign carriers. Particularly in transatlantic markets, foreign carriers' partnerships and codeshares with U.S. airlines can facilitate seamless connections to international flights. The adoption of newer aircraft technology also allows airlines to expand their fleets and utilize smaller and more fuel-efficient aircraft, like the Airbus A321LR and Boeing 737 MAX. This benefits mid-size O&D markets such as the City of Boston. The economic viability of using longer-range **widebody aircraft**, like the Airbus A350, Boeing 787, and upcoming Boeing 777X, also supports increased connectivity and seat capacity on fewer flights.

Figure 3-4 Annual Passengers Served by Logan Airport's Major Airlines, 2000–2022



Source: Massport

Notes: U.S. Airways totals in this chart include America West Airlines beginning in 2006 (following 2005 merger); Delta Air Lines totals include Northwest Airlines beginning in 2009 (following 2008 merger); United Airlines totals include Continental Airlines beginning in 2011 (following 2010 merger); and Southwest Airlines totals include AirTran Airways beginning 2012 (following 2011 merger).

5 An airline interline agreement is a commercial agreement between two or more airlines that allows passengers to travel on multiple flights operated by different airlines using a single ticket and checked-through baggage. It enables airlines to provide seamless travel experiences to passengers by facilitating the transfer of passengers and their baggage between connecting flights.

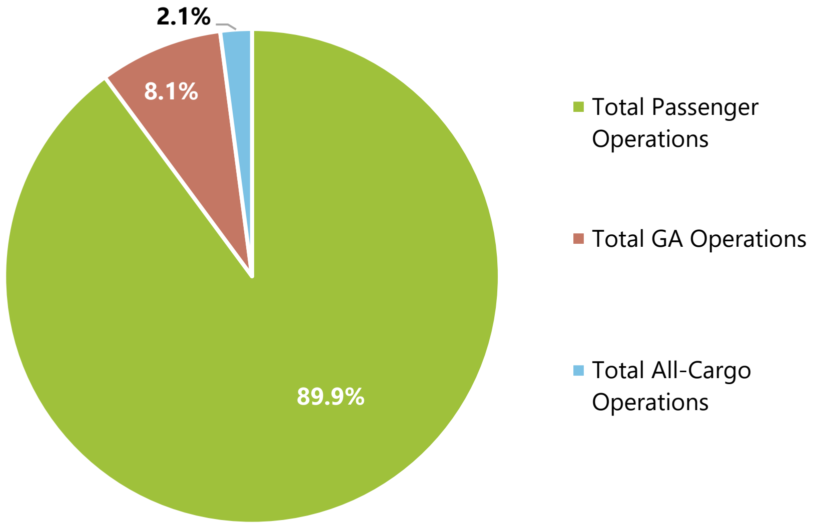
6 An airline codeshare agreement is a commercial agreement where two or more airlines sell seats on the same flight using their own respective flight numbers. This allows airlines to offer more flights to more destinations without as many associated costs, and provides similar benefits to passengers as interline agreements.

3.1.2 Aircraft Operation Levels in 2022

This section reports on aircraft operations levels for Logan Airport, including commercial passenger aircraft, **General Aviation (GA)** aircraft, and cargo aircraft operations as well as aircraft passenger **load factors** in 2022. The load factor is the percentage of actual passengers on a flight relative to the number of seats potentially available on the aircraft of the given flight.

As shown in **Figure 3-5**, passenger aircraft operations in 2022 accounted for 89.9 percent of total aircraft operations at Logan Airport, about 1.7 percent less than its 2019 share of 91.6 percent. GA and cargo operations exceeded 2019 levels by 1.3 and 0.5 percent, respectively. Passenger operations increases are attributed to positive economic activity, federal financial support, improved local and state **gross domestic product (GDP)**, lower unemployment rates, demand for previously deferred leisure or non-essential air travel due to COVID among New Englanders, and the return of business and corporate travel segments.

Figure 3-5 Logan Airport Passenger, GA, and Cargo Aircraft Operations in 2022



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

3.1.2.1 Logan Airport Aircraft Operations

The total number of aircraft operations at Logan Airport declined from its recent historic peak of 427,176 operations in 2019 to 378,613 operations in 2022. However, the number of aircraft operations increased between 2021 and 2022, as shown in **Table 3-3**. The Airport's total aircraft operations were less than 2019 levels, primarily due to fewer passenger flight operations as commercial airlines continued to adjust their scheduled network plans. Airlines focused on identifying nonstop service pairs, in addition to balancing labor supply and seat capacity, while responding to the return of passenger demand and desired market connections in post-pandemic economic and travel demand conditions.

Table 3-3 Logan Airport Aircraft Operations Over Time and Aircraft Operations by Type

	2000	2010	2019	2020	2021	2022	% Change (2021-2022)	2022 as a % Above / Below 2019 Levels
Total Aircraft Operations	487,996	352,643	427,176	206,702	266,034	378,613	28.7%	-11.4%
Passenger Jet	254,968	214,307	296,514	146,071	185,010	244,971	+50.1%	-17.4%
Passenger Regional Jet	37,600	66,498	49,417	10,484	15,778	60,891	+61.8%	+23.2%
Passenger Non-Jet	147,913	50,882	45,492	28,712	33,431	34,449	+3.0%	-24.3%
Total Passenger Operations	440,481	331,687	391,424	185,268	234,219	340,311	+45.3%	-13.1%
GA Jet Operations	20,595	11,430	19,328	10,110	18,123	24,078	+32.9%	+24.6%
GA Non-Jet Operations	14,638	3,252	9,594	3,748	5,919	6,426	+8.6%	-33.0%
Total GA Operations	35,233	14,682	28,922	13,858	24,042	30,504	+26.9%	+5.5%
Cargo Jet	11,788	5,332	6,402	7,208	7,655	7,390	-3.5%	+15.4%
Cargo Non-Jet	494	942	428	368	118	408	+245.8%	-4.7%
Total Cargo Operations	12,282	6,274	6,830	7,576	7,773	7,798	+0.3%	+14.2%

Source: Massport.

Notes: The Passenger Regional Jet category includes the Embraer E-190 aircraft, which is a regional jet configured with 88 to 100 seats, but is similar in size to some traditional narrowbody jets.

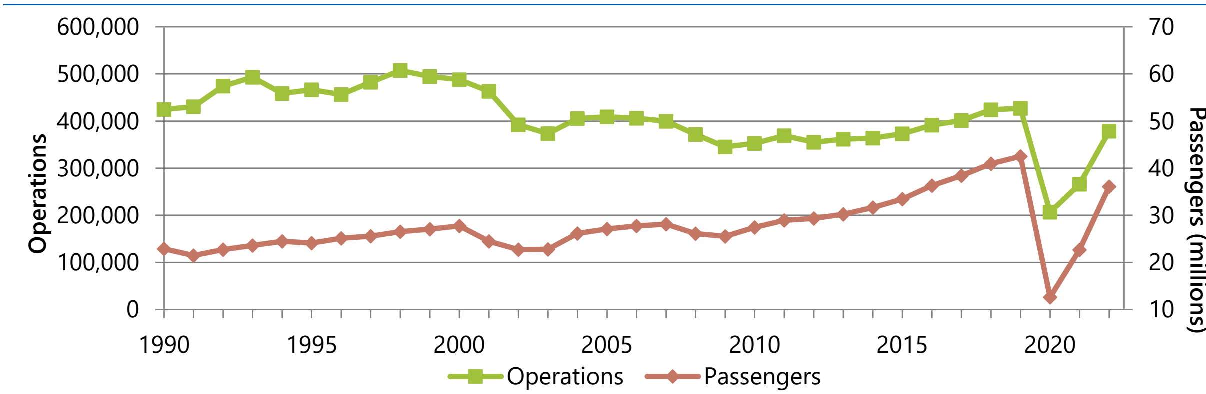
N/A indicates data was not available.

Throughout the year, several airlines increased service frequencies to existing markets from Logan Airport and introduced new point-to-point nonstop services to cater to travel demand trends.

- Total passenger aircraft operations in 2022 increased by 106,092 operations from 2021. Between 2021 and 2022, total passenger operations increased more than total GA operations and cargo operations. Among passenger aircraft operations, **Regional Jet (RJ) aircraft** operations had an additional 23,300 flights, specifically from domestic, short- and medium-haul routes served by regional airline operators affiliated with legacy network carriers, such as Delta Connection and American Eagle. There were more RJ operations in 2022 than in 2019, as carriers optimized their hub airport networks for connecting opportunities and continued to implement strategies to resume pre-pandemic services.
- Dedicated cargo operations, which do not carry commercial passengers in addition to cargo, experienced minimal growth in 2022 compared to the previous year, but still exceeded 2019 levels. The revival of passenger aircraft movements supports related growth in cargo operations because cargo is also often transported as **belly cargo** on passenger aircraft. This factor remains significant for foreign carriers operating widebody jets as international operation volumes recover.
- Although Logan Airport's 2022 GA operations surpassed 2019 levels, they were nearly 2.0 percent short of the 2017 peak. This trend is attributed to the on-going shift of GA operations towards smaller airports across New England, including Laurence G. Hanscom Field and Worcester Regional Airport.

Figure 3-6 depicts past and current passenger levels and aircraft operations. The data shows a historical trend of passenger levels increasing and operations decreasing, though not as rapidly as passenger activity levels are increasing. Between 2000 and 2019, there was a 53.4 percent increase in the annual passenger count at Logan Airport, accompanied by a 12.5 percent decrease in the annual number of aircraft operations. This indicates the growing trend among air carriers towards greater aircraft load factors, or more passengers per flight; greater efficiencies; and more seats per aircraft.

Figure 3-6 Logan Airport Annual Passenger Levels and Aircraft Operations, 1990-2022



Source: Massport

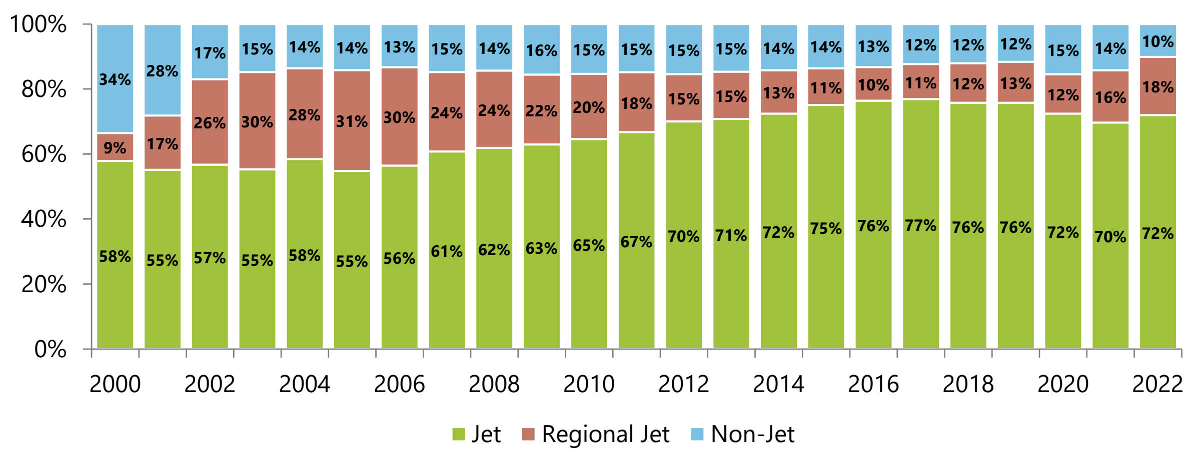
3.1.2.2 Passenger Aircraft Operations

Logan Airport had fewer passenger aircraft operations in 2022 than in 2019. Delta Air Lines, jetBlue Airways, American Airlines, Cape Air, United Airlines, and Southwest Airlines accounted for nearly 79 percent of total aircraft operations in 2022.[7]

While **Table 3-3** shows year-over-year changes in passenger jet, RJ,[8] and **non-jet aircraft** operations, the change in the mix of passenger aircraft operations since 2000 is shown in **Figure 3-7**.

- Since 2012, passenger jet aircraft operations have accounted for 70 percent or more of the total number of passenger aircraft operations at Logan Airport. Although jet aircraft operations were 72 percent of the total passenger aircraft operations in 2022, this was still less than jet aircraft operation levels in 2019.
- RJs accounted for 17.9 percent of total passenger operations in 2022, compared to 31.0 percent at the peak level in 2005, and 12.0 percent in 2019.
- Non-jet operations, including turboprop aircraft like the DHC-8, or Dash-8, aircraft, demonstrated the least recovery among the passenger segment of total aircraft operations, remaining 24.3 percent below 2019 levels.

Figure 3-7 Passenger Aircraft Operations at Logan Airport by Jet, Regional Jet, and Non-Jet, 2000-2022



Source: Massport.

Notes: Jet includes the Embraer E190, which is a regional jet configured with 88 to 100 seats but is similar in size to some traditional narrow-body jets.

Compared to the *2017 ESPR* and *2020/2021 EDR*, E-175 domestic passenger regional jet types were reclassified and therefore result in revised RJ share values for 2017, 2020 and 2021.

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

8 In this report, the term regional jet (RJ) refers to small jet aircraft with fewer than 90 seats, while large jet aircraft are considered those with 90 seats or more. The Embraer-190, operated by jetBlue Airways at Logan Airport, carries up to 100 passengers and is considered a jet.

Passenger Jet Aircraft Operations

In 2022, large passenger jet operations totaled 244,971 takeoffs and landings, less than 2019 levels. This is equivalent to 72.0 percent of the previously mentioned 340,311 passenger aircraft operations. Notably, Delta Air Lines exceeded its 2019 passenger jet operations by 11.0 percent. However, several major airlines at Logan Airport like Southwest and Spirit Airlines are still more than 30.0 percent below 2019 levels, as measured by 2019 operation counts. Meanwhile, jetBlue Airlines and American Airlines have been affected the average decline, operating between 18.0 to 20.0 percent below 2019 volumes. The differences between rates of recovery among passenger jet aircraft operations are further emphasized by the on-going recovery in the international long-haul segment, operated by non-U.S. based carriers such as Virgin Atlantic, British Airways, Copa Airlines, and Cathay Pacific, among others.

Passenger Regional Jets

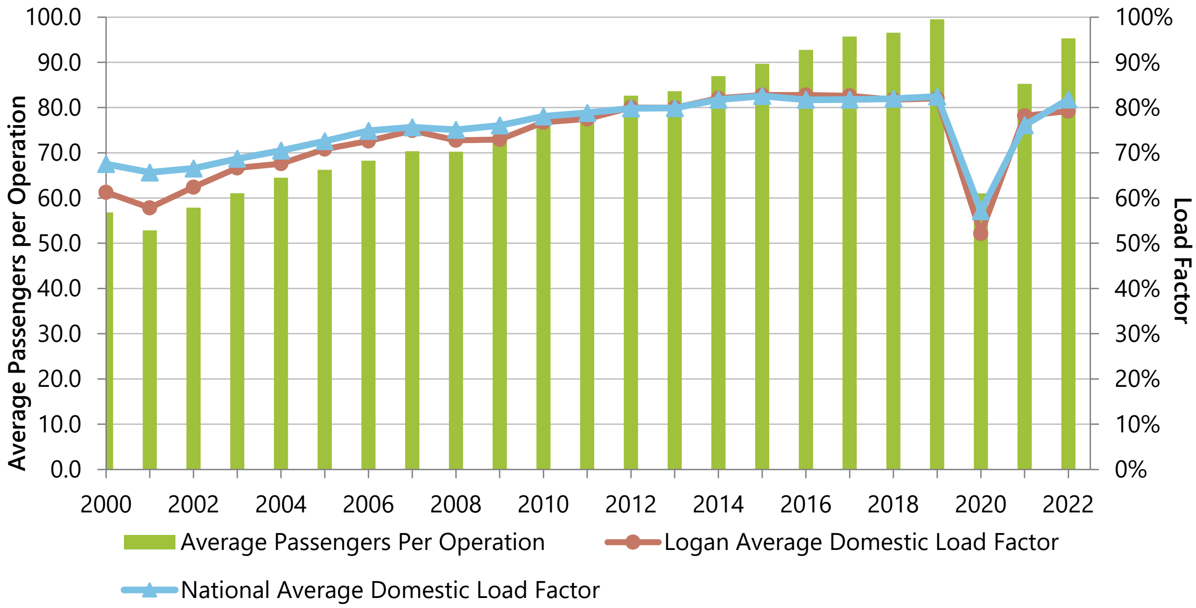
The number of RJ operations increased the most in 2022 with 45,113 more flights than in 2021, and 2022 RJ operations exceeded 2019 operations by 23.2 percent, or 11,474 flights. From 2006 to 2016, RJ operations steadily declined as airlines discontinued unprofitable services to smaller markets and consolidated operations following airline mergers. However, by 2019, passenger RJ operations surged once again by 35.0 percent over 2016 levels, which is attributed to lower fuel costs. This led mainline or legacy carriers' regional partners to increase RJ utilization. During the COVID-19 pandemic in 2020, RJ activity at Logan Airport declined at the same rate as jet operations. This was due to airlines suspending or reducing route frequencies to nonviable markets while simultaneously introducing new services to cities that experienced heightened demand. This strategy optimized smaller RJ aircraft redeployment to maximize onboard passenger load factors.

3.1.2.3 Passengers per Aircraft and Load Factors

After reaching a peak in 2019 with an average of 99.5 passengers per aircraft operation, in 2022, the average number of passengers per flight at Logan Airport was returning to pre-pandemic levels at 95.3 passengers per flight. International services, primarily operated by larger widebody aircraft with over 200 seats, resumed in 2022 as both U.S. and foreign carriers reinstated previously suspended nonstop flights and introduced new market connections. Legacy carriers have also utilized smaller RJ aircraft for short-haul domestic segments, connecting passengers from Logan Airport to their respective U.S. hub markets. Newer and larger aircraft, like the Airbus A350, Boeing 787, Boeing 777, and Airbus A380 superjumbo jets, were instrumental in boosting the average number of passengers per operation before the pandemic, particularly on high-demand transatlantic routes such as Boston to London. This trend is expected to continue in the post-pandemic era. **Figure 3-8** illustrates the changes in the number of passengers per operation and load factors at Logan Airport.

More people are flying year-over-year, while the number of flights are fewer year-over-year, indicating increased efficiency per flight operation, including greater **load factors**.

Figure 3-8 Passengers per Aircraft Operation and Aircraft Load Factors, 2000-2022



Source: Massport; U.S. Department of Transportation (U.S.DOT), T-100 Database via Airline Data, Inc., accessed June 2023.
Notes: Includes scheduled passenger service only.

The rise in the average number of passengers per aircraft operation at Logan Airport reflects an increase in aircraft seating capacity,[9] a larger load factor as a percentage of seats occupied by passengers, or a combination of both.

Table 3-4 presents the average number of passengers accommodated per flight over a time interval spanning from 2000 to 2022 as well as the percent change year-over-year. Despite increased demand and peak travel seasons, airlines in 2022 carried more passengers on fewer flights, focusing on load factor performance. This involved using smaller aircraft temporarily, minimizing empty seats, and utilizing older and higher operating cost aircraft on shorter routes. As international and transcontinental flights resumed, larger aircraft within the fleet that were impractical to fly during the height of the pandemic were returned to service. Airline network and fleet planning teams closely monitored increases in seat capacity utilization rates as more fuel-efficient aircraft were brought back into service. Logan Airport saw an improvement in its average domestic load factor to 79.2 percent in 2022, a 1.0 percent increase compared to the previous year. However, it remained 2.8 percent below the 2019 load factor. The national average domestic load factor in 2022 remained constant at 81.8 percent.[10]

9 The number of onboard passengers as a percentage of total available seats operated on a flight segment at the Airport.
10 U.S. DOT T-100 Database; includes scheduled passenger service only.

Table 3-4 Past and Current Air Passengers and Aircraft Operations and Load Factors

Year	Air Passengers	Percent Change from Previous Year	Aircraft Operations (Flights)	Percent Change from Previous Year	Average Number of Passengers per Operation	Net Change from Previous Year	Average Domestic Load Factor	Net Change from Previous Year
2000	27,726,833	+2.5%	487,996	-1.4%	56.8	+2.1	61.3%	+0.4%
2010	27,428,962	+7.5%	352,643	+2.1%	77.8	+3.9	76.8%	+3.8%
2015	33,449,580	+5.7%	372,930	+2.5%	89.7	+2.7	82.8%	+0.7%
2016	36,288,042	+8.5%	391,222	+4.9%	92.8	+3.1	82.8%	0.0%
2017	38,412,419	+5.9%	401,371	+2.6%	95.7	+2.9	82.6%	-0.2%
2018	40,941,925	+6.6%	424,024	+5.6%	96.6	+0.9	81.8%	-0.8%
2019	42,522,411	+3.9%	427,176	+0.7%	99.5	+3.0	82.0%	+0.3%
2020	12,618,128	-70.3%	206,702	-51.6%	61.0	-38.5	52.2%	-29.8%
2021	22,678,499	+79.7%	266,034	+28.7%	85.2	+24.2	78.3%	+26.1%
2022	36,090,716	+59.1%	378,613	+42.3%	95.3	+10.1	79.2%	-1.0%

Source: Massport; U.S. DOT, T-100 Database.
Notes: Includes scheduled passenger service only.
Refer to Appendix F, *Activity Levels Supporting Documentation*, Section F.1, for additional passenger and operations data dating back to 1980.

In 2022, airlines continued to adjust their schedules and operations post-pandemic to meet profitability goals, improve labor productivity, and mitigate rising fuel costs[11] and labor shortages. These efforts were necessary to reduce the adverse impacts to airline businesses from the COVID-19 pandemic and to avoid unnecessary operational disruptions. This came at a time when emergent demand for COVID-19 deferred travel added additional stress to key airline hub systems; particularly during traditional peak travel seasons, like holidays and over the summer months.

3.1.3 General Aviation Operations

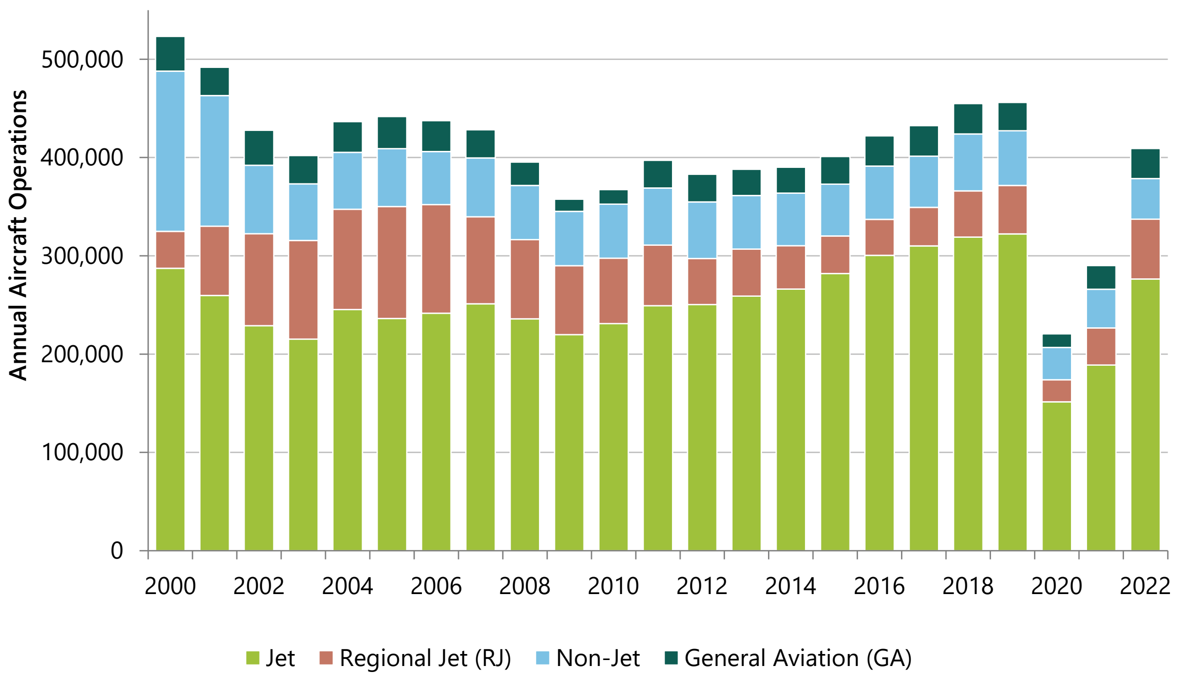
General aviation, or GA, is generally considered to encompass civilian, non-scheduled, and non-commercial aviation activities. GA usually refers to activities and aircraft like sport aviation and acrobatics; personal aviation with privately owned jets or piston aircraft; agricultural services like crop-dusting planes; or gliders and sailplanes, to name a few. Activities like scheduled commercial passenger or cargo airline services and military operations are excluded from the GA category. GA encompasses a variety of aviation activities at Logan Airport, including private corporate or business aviation, private business jet charters, law enforcement flights, and emergency medical flights or air

11 Fuel costs (Kerosene type jet fuel spot prices) increased 82 percent between 2021 and 2022, from $1.858 per gallon to $3.374 per gallon. Per the U.S. Energy Information Administration (EIA) (https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=EER_EPJK_PF4_RGC_DPG&f=A/)

ambulance services. Operations are conducted by a diverse group of private individuals and businesses, and aircraft range from single-engine piston-driven aircraft to high-performance, long-range jets.

GA operations in 2022 accounted for 30,504 operations out of the total aircraft operations at Logan Airport, but remained less than the Airport's recent decade record high of 31,120 flights in 2017. GA operations in 2022 exceeded 2019 operations by 5.5 percent. **Table 3-3** in Section 3.1.2.1 shows year-over-year changes in GA operations.[12] **Figure 3-9** depicts changes in the number of Logan Airport aircraft operations and relative distributions among total operations by category since 2000.

Figure 3-9 Aircraft Operations at Logan Airport by Aircraft Class, 2000-2022



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

12 Hanscom Field remains the primary GA airport for the Greater Boston region, accommodated over four times the number of GA operations than Logan Airport reported. Hanscom Field accommodated 119,961 GA operations in 2022, which represented 98.2 percent of Hanscom Field's total aircraft activity. See Chapter 5, Regional Transportation, for additional information on Hanscom Field.

3.1.4 Cargo Operations

Cargo carriers at Logan Airport include FedEx, United Postal Service (UPS), DHL, and a few other carriers that operate widebody freight aircraft. After reaching historic highs of greater than 2.5 percent of the total aircraft activity during the pandemic, the share of operations by aircraft dedicated to only transporting cargo declined to 2.1 percent of aircraft activity at Logan Airport in 2022. This signals a return to cargo operation levels experienced prior to the pandemic, which typically ranged between 1.6 and 2.0 percent. The marked increase in cargo operations relative to the total number of operations conducted at Logan Airport was primarily due to the concurrent decline in commercial passenger activity and operations in 2020 and 2021. **Table 3-3** in Section 3.1.2.1 shows the year-over-year changes in cargo operations.

3.2 2022 Service Developments at Logan Airport

Seat capacity is the total number of seats available, or the system's capacity.

Load factor is the number of those seats occupied per flight, or the system's efficiency.

Airlines can adjust service at an airport or on a specific route in two ways: by changing the number of flights operated or changing the size of the aircraft. Changes in flight frequency and changes in aircraft size both affect the number of seats available to passengers, or the seat capacity. Airline services are therefore typically discussed in terms of seat capacity as well as the number of flight departures.[13] Seat capacity differs from load factor as seat capacity is the total number of seats available, or the capacity of the system, while load factor is the number of those seats occupied per flight, or the efficiency of the system.

This section examines changes in airline departures and seat capacity at Logan Airport in 2022. It also presents an overview of routes that are new, suspended, or discontinued, all influenced by the pandemic's impact on passenger demand and airlines' reprioritizations of economically feasible routes. When relevant, forthcoming 2023 airline announcements are noted. For context, schedule analyses in this section are compared with figures from 2019 as well as prior years, where appropriate.

3.2.1 Airline Passenger Service

According to OAG Analyzer[14] schedules, in 2022, 40 airlines offered non-stop, scheduled passenger service from Logan Airport to 139 global destinations. This is compared to 2021, when 36 airlines offered scheduled passenger service to 125 global destinations.[15] The average non-stop stage length[16]

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

14 The OAG Analyzer is an online data platform published by OAG Aviation which provides in-depth information related to airline and airport operations, including schedules, passenger traffic, as well as data provided by the U.S. DOT.

15 Based on OAG Analyzer schedules.

16 Stage length refers to the average length of a non-stop flight.

in 2022 for scheduled domestic flights from Logan Airport were relatively unchanged at a distance of 1,095 miles, compared to 1,093 miles in 2019. The average non-stop stage length of scheduled international flights decreased slightly in 2022 compared to 2019, from 3,199 miles to about 3,091 miles. This was due to airlines resuming greater activity to closer international destinations less than 2,500 miles from Logan Airport, such as the Central America and Caribbean regions, as compared to long-haul flight routes to destinations across either the Atlantic or Pacific Oceans. Major changes in Logan Airport's scheduled passenger services in 2022 are described below.

3.2.2 Changes in Domestic Passenger Service

Table 3-5 shows year-over-year changes in domestic air passenger operations. The total number of scheduled domestic flights at Logan Airport in 2022 remained 11.8 percent less than 2019. For comparison, 2021 scheduled flights were 44.2 percent less than 2019. Overall, scheduled jet operations by legacy carriers and LCCs increased considerably in 2022 compared to 2021, while regional and commuter flights increased relatively less.

Table 3-5 Scheduled Domestic Air Passenger Operations by Airline Category, 2000, 2010, 2019-2022

Category	2000	2010	2019	2020	2021	2022	% Change (2021-2022)	2022 as % Above / Below 2019 Levels
Scheduled Jet Carriers	233,993	203,081	257,202	119,153	143,520	211,384	+47.3%	-27.8%
Legacy Carriers[1]	222,564	117,877	121,387	57,211	72,990	108,796	+49.1%	-10.4%
Low-Cost Carriers[2]	11,429	85,204	135,815	61,942	70,530	102,588	+45.5%	-24.5%
Regional / Commuter Jet	160,041	94,535	79,736	47,257	68,029	85,707	+26.0%	+7.5%
Total Scheduled Domestic	394,034	297,616	336,938	166,410	211,549	297,091	+40.4%	-11.8%

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

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

Trends observed after comparing scheduled domestic passenger flight activity in 2022 against 2019 levels are summarized below.

- **Legacy carrier service did not fully return to 2019 levels by the end of 2022.** Although legacy carrier jet operations increased in 2022 compared to the prior year, operations remained below 2019 levels.
- Among the top five legacy carriers, Delta Air Lines has recovered to pre-pandemic conditions, ending 2022 about 12.0 percent above its 2019 performance. This metric excluded Delta Air Line's regional carrier affiliate activity. Delta Air Lines was followed by American Airlines and United Airlines, which recovered approximately 80 percent of their respective 2019 operations.
  - By year-end 2022, Delta Air Lines commenced new operations to Nashville, TN; New Orleans, LA; Denver, CO; San Diego, CA; Kansas City, MO; and Jacksonville, FL. American Airlines did not launch substantial new mainline[17] services in 2022, but continued to operate nonstop flights to Austin, TX. Mainline connectivity to St. Louis, MO ended in late 2022 and was replaced with American Eagle service by Envoy Air and Republic Airways. United did not add mainline activity in 2022.
- **In 2022, LCC and ULCC services recovered to 24.5 percent below 2019 operations levels.** LCC and ULCC operations accounted for 34.5 percent of Logan Airport's total scheduled domestic operations in 2022.[18] Pre-pandemic shares ranged between 40 and 42 percent.
  - The largest carrier in this group, jetBlue Airways, conducted approximately 20 percent fewer operations in 2022 than in 2019. However, jetBlue concurrently introduced new nonstop routes to Milwaukee, WI; Kansas City, MO; and Asheville, NC.
  - By year-end 2022, 10 of jetBlue Airways' 48 metropolitan markets returned to at least 80 percent of their respective 2019 operations levels. These markets had more than once-daily departures in 2019. The greatest number of departures were to New York, NY, Washington DC, Orlando, FL, San Francisco, CA, Tampa, FL, Los Angeles, CA, San Diego, CA, and Nashville, TN.
  - By year-end 2022, Spirit Airlines returned to 40 percent below its 2019 operations levels and Southwest Airlines returned to 47 percent below its 2019 operations levels. Frontier Airlines, however, only returned to 5 percent of its 2019 operations levels. Sun Country continued to exceed its 2019 levels by about 44 percent, although it had the smallest network among the LCCs and ULCCs. It should be noted that Sun Country operated 60 percent fewer flights than its peak activity levels in 2018.
  - In 2022, Allegiant Air added Flint, MI, growing its Logan Airport network to 8 destinations less than 1,300 miles away.

17 Mainline refers to a flight operated by an airline's principal operating unit rather than a regional alliance airline, codeshare, or subsidiary.

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

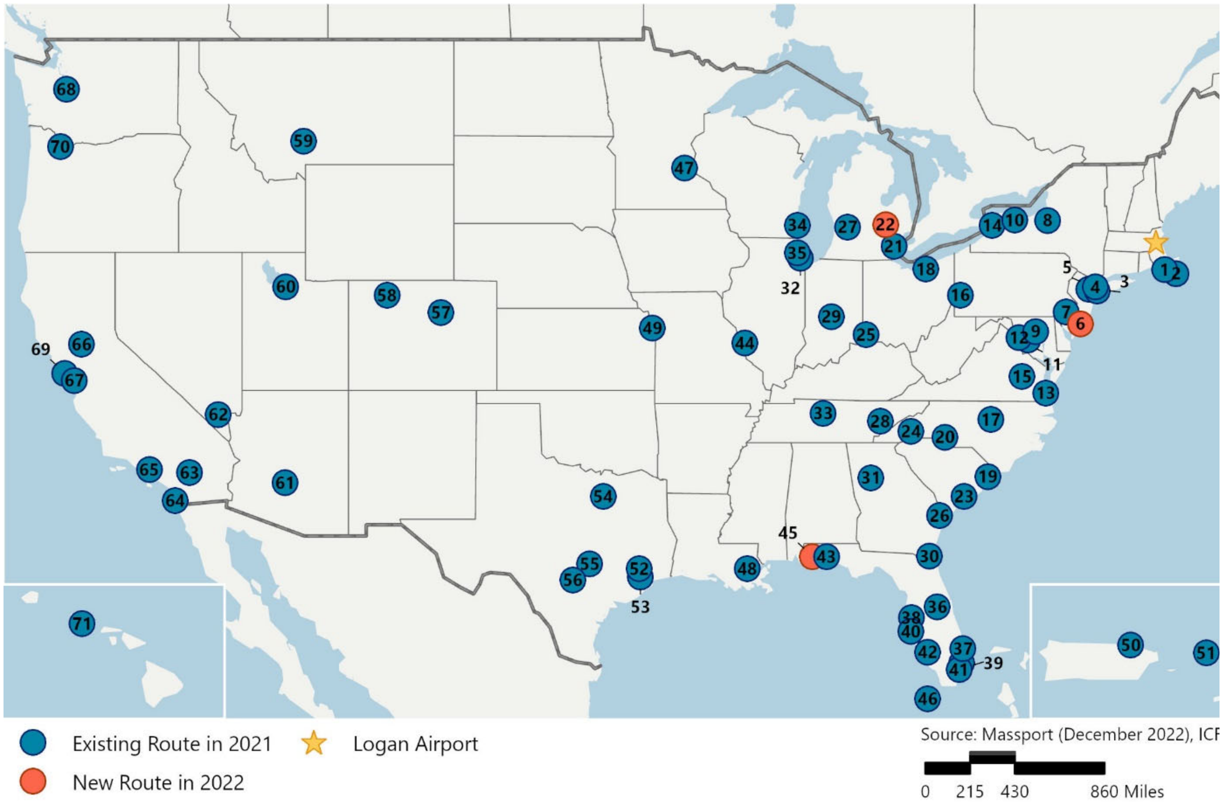
- **Regional and commuter service recovered the fastest in 2022, exceeding 2019 levels by 7.5 percent.** Republic Airlines'[19] 2022 operations recovered a remarkable 205 percent compared to its 2019 levels. This represented 52 percent of the airline's domestic regional and commuter operations.
  - Republic Airlines' aircraft operations count grew from 29,983 in 2021 to over 44,600. This was primarily because GoJet, a Delta Connection-branded carrier, exited Boston after Delta Air Lines terminated its operating agreements with GoJet and another Delta Connection-branded carrier, Compass Airlines. This led to reduced Delta Connection-branded operator flights operating at Logan going into 2020; resulting in Republic Airlines gaining market share in the regional segment.
  - The shift in regional segment market share discussed above coincided with RJ pilot shortages, which led SkyWest to drop regional routes systemwide throughout 2021 and 2022. By 2022, SkyWest operated less than 800 flights from Logan Airport, mainly as Delta Connection and United Express, but in 2019, SkyWest managed 4,800 flights out of Logan Airport.
  - Hyannis Air Service, operating as Cape Air, was the largest regional operator at Logan Airport prior to 2022, but dropped in rank to second. Cape Air accounted for 34 percent of domestic regional and commuter flights in 2022. Cape Air operated 6 percent fewer flights year-over-year but continues to operate services to the same destinations flown pre-pandemic, except for service to Albany, NY. Within Cape Air's network of flights from Logan Airport, four routes experienced reduced route frequencies since 2021. These reduced routes included Portland, OR with 84 percent fewer flights than in 2021; Hyannis, MA with 35 percent fewer flights than in 2021; Adirondack, NY with 28 percent fewer flights than in 2021; and Bar Harbor, ME with 11 percent fewer flights than in 2021. Altogether, six of Cape Air's Logan Airport destinations are eligible for classification as Essential Air Service (EAS) communities[20] in the New England and New York regions.

Logan Airport's scheduled domestic **Large Jet** and domestic regional services are illustrated in **Figure 3-10** and **Figure 3-11**. A complete listing of all changes in scheduled departures by domestic destination is in Appendix F, *Activity Levels Supporting Documentation*, Section F.1.2.

19 Republic Airlines is affiliated with American Airlines, Delta Air Lines and United Airlines.

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

Figure 3-10 Domestic Non-Stop Large Jet Markets Served from Logan Airport, 2022

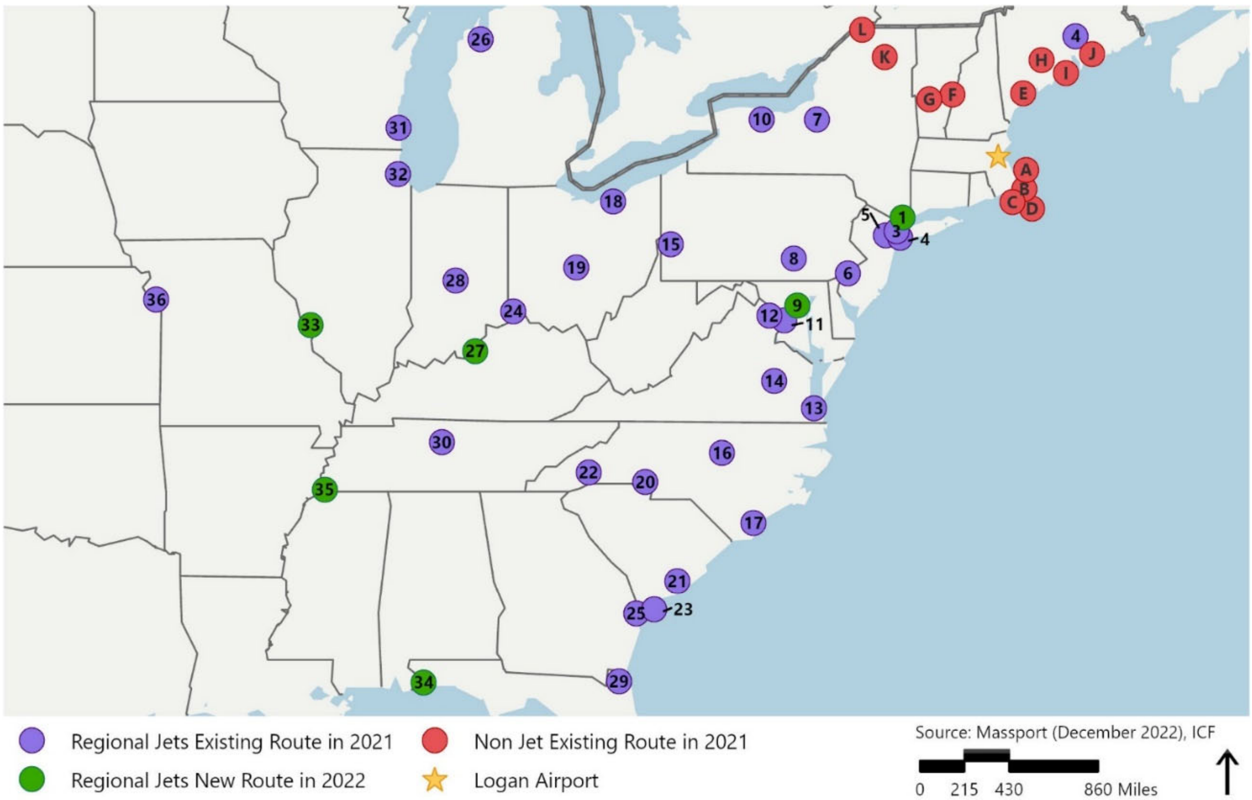


#	Location	#	Location	#	Location	#	Location
1	Martha's Vineyard, MA	19	Myrtle Beach, SC	37	West Palm Beach, FL	55	Austin, TX
2	Nantucket, MA	20	Charlotte-Douglas, NC	38	Tampa, FL	56	San Antonio, TX
3	New York, NY (JFK)	21	Detroit, MI	39	Fort Lauderdale, FL	57	Denver, CO
4	New York, NY (LaGuardia)	22	Flint, MI	40	Sarasota/Bradenton, FL	58	Steamboat Springs/Hayden,
5	New York, NY (Newark)	23	Charleston, SC	41	Miami, FL	59	Bozeman, MT
6	Atlantic City, NJ	24	Asheville/Hendersonville, NC	42	Fort Myers, FL	60	Salt Lake City, UT
7	Philadelphia, PA	25	Cincinnati, OH	43	Destin-Ft Walton Beach, FL	61	Phoenix, AZ
8	Syracuse, NY	26	Savannah, GA	44	St. Louis, MO	62	Las Vegas, NV
9	Baltimore, MD	27	Grand Rapids, MI	45	Pensacola, FL	63	Palm Springs, CA
10	Rochester, NY	28	Knoxville, TN	46	Key West, FL	64	San Diego, CA
11	Washington, D.C. (Reagan)	29	Indianapolis, IN	47	Minneapolis/St. Paul, MN	65	Los Angeles, CA
12	Washington, D.C. (Dulles)	30	Jacksonville, FL	48	New Orleans, LA	66	Sacramento, CA
13	Norfolk, VA	31	Atlanta, GA	49	Kansas City, KS	67	San Jose, CA
14	Buffalo, NY	32	Chicago, IL (Midway)	50	San Juan, PR	68	Seattle, WA
15	Richmond, VA	33	Nashville, TN	51	St. Thomas, USVI	69	San Francisco, CA
16	Pittsburgh, PA	34	Milwaukee, WI	52	Houston, TX (Bush)	70	Portland, OR
17	Raleigh/Durham, NC	35	Chicago, IL (O'Hare)	53	Houston, TX (Hobby)	71	Honolulu/Oahu, HI
18	Cleveland, OH	36	Orlando, FL	54	Dallas/Fort Worth, TX		

Source: OAG Analyzer.

Note: There were three new domestic, non-stop large jet routes in 2022 to Flint, MI, Pensacola, FL, and Atlantic City, NJ; all of which are seasonally served.

Figure 3-11 Domestic Non-Stop Regional Jet and Non-Jet Markets Served from Logan Airport, 2020 and 2022



Regional Jet

#	Location	#	Location	#	Location
1	White Plains, NY	13	Norfolk, VA	25	Savannah, GA
2	New York, NY (JFK)	14	Richmond, VA	26	Traverse City, MI
3	New York, NY (LaGuardia)	15	Pittsburgh, PA	27	Louisville, KY
4	Bangor, ME	16	Raleigh/Durham, NC	28	Indianapolis, IA
5	New York, NY (Newark)	17	Wilmington, NC	29	Jacksonville, FL
6	Philadelphia, PA	18	Cleveland, OH	30	Nashville, TN
7	Syracuse, NY	19	Columbus, OH	31	Milwaukee, WI
8	Harrisburg, PA	20	Charlotte-Douglas, SC	32	Chicago, IL
9	Baltimore, MD	21	Charleston, SC	33	St. Louis, MO
10	Rochester, NY	22	Asheville/Hendersonville, NC	34	Pensacola, FL
11	Washington, DC (Reagan)	23	Hilton Head Island, SC	35	Memphis, TN
12	Washington, DC (Dulles)	24	Cincinnati, OH	36	Kansas City, KS

Non Jet

ID	Location
A	Provincetown, MA
B	Hyannis, MA
C	Martha's Vineyard, MA
D	Nantucket, MA
E	Portland, ME
F	Lebanon/Hanover, NH
G	Rutland, VT
H	Augusta, ME
I	Rockland, ME
J	Bar Harbor, ME
K	Saranac Lake, NY
L	Massena, NY

Source: OAG Analyzer.

Note: There were six new domestic, non-stop regional jet routes in 2022, to Baltimore, MD, Louisville, KY, Memphis, TN, White Plains, NY, and St Louis, MO. There were no new routes added on non-jet aircraft.

3.2.3 2022 Changes in International Passenger Service

Total scheduled international passenger aircraft operations at Logan Airport increased to 43,172 operations in 2022. The number of operations was less than 2019 but represented a 90.6 percent annual increase compared to 2021 levels. Foreign governments eased international travel restrictions throughout 2022 and the U.S. lifted its international travel entry bans in November 2021 for fully vaccinated foreign nationals. By mid-June 2022, the U.S. Centers for Disease Control and Prevention (U.S.CDC) rescinded the order requiring negative COVID-19 tests prior to boarding U.S. flights. By this time, the pandemic had shifted to a new phase due to widespread immunization with highly effective COVID-19 vaccines and effective therapeutics had lowered the risk of both transmitting or contracting the disease. In May 2023, noncitizen, nonimmigrant visitors to the U.S. arriving by air, land, or sea no longer needed to show proof of being fully vaccinated against COVID-19.[21] These decisions and factors contributed favorably towards the U.S. international air travel segment's return to previous demand levels at Logan Airport.

Table 3-6 summarizes U.S. and foreign airlines increased scheduled international operations in 2022. For details on the changes in operations by carrier, see Appendix F, Section F.1.2.

Table 3-6 Scheduled International Passenger Operations by Market Segment, 2000, 2010, 2019-2022

Category	2000	2010	2019	2020	2021	2022	% Change (2021-2022)	2022 as % Above / Below 2019 Levels
Canada	26,067	16,399	17,074	3,808	3,060	10,406	+240.1%	-39.1%
Europe / Middle East / North Africa	13,345	12,750	21,590	7,385	9,180	21,122	+130.1%	-2.2%
Bermuda / Caribbean[1]	3,205	4,116	9,682	5,925	8,274	8,803	+6.4%	-9.1%
Asia	0	0	2,854	823	1,008	1,179	+17.0%	-58.7%
Central / South America	314	0	3,268	860	1,134	1,662	+46.6%	-49.1%
Total Scheduled International Passenger Operations	42,931	33,265	54,468	18,801	22,656	43,172	+90.6%	-20.7%

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

21 USA.gov "COVID-19 international travel advisories" https://www.usa.gov/covid-international-travel#:~:text=As%20of%20May%2012%2C%202023,a%20negative%20COVID%2D19%20test/.

In 2022, international aircraft operations showed varied rates of change across different segments. Flights to Asia returned at the slowest rate, recovering minimally between 2021 and 2022, and remaining significantly lower than 2019 levels. The sluggish operation count recovery for flights to Asia can be attributed to challenges stemming from border and tourism reopening in several Asian markets, particularly China. Additionally, U.S. carriers managed to leverage connecting opportunities through their Pacific coast hubs, while air service between the U.S. and China faced limitations due to evolving bilateral agreements that affected the combined roundtrips per week allowed between the two nations. Although Japan Airlines and Korean Air recovered their operational levels in 2022, Hong Kong-based Cathay Pacific operated at around 11 percent of its 2019 capacity. Notably, Hainan Airlines' flights from Logan to Shanghai and Beijing remained suspended, despite representing 36 percent of total jet flights to Asia in 2019.

Compared to its 2021 performance, Canadian operations experienced an uptick in activity, mainly due to the nation's decision to reopen its borders with the U.S. starting in August 2021. The Canadian segment rebounded to approximately 60.9 percent of 2019 levels in 2022.

Services connecting Europe and the Middle East, and the Caribbean surpassed 90 percent of pre-pandemic levels by year-end 2022. The Caribbean market's closer proximity as well as the mix of nonstop service offerings by jetBlue Airways, Delta Air Lines, and American Airlines supported a return to pre-pandemic operations levels. Spirit Airlines also played a role, initiating flights to the Caribbean in 2020, and increasing flight frequencies by 25 percent since 2021.

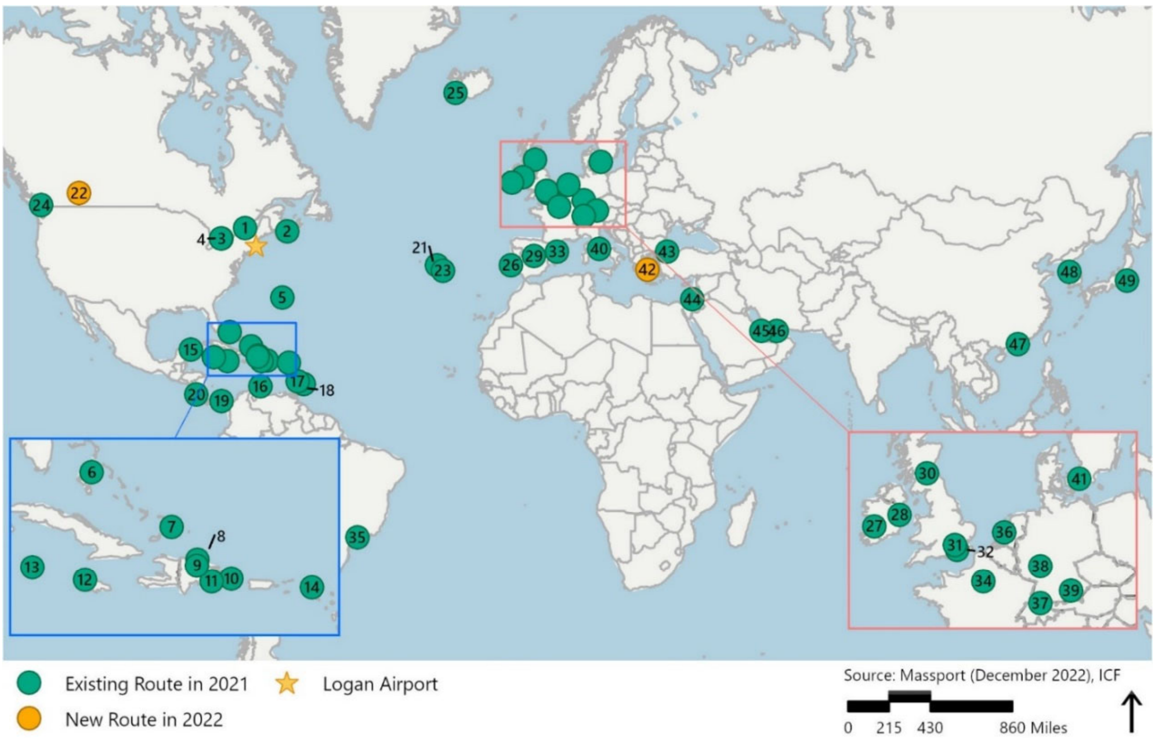
European transatlantic flights experienced improvements as airlines reinstated previously suspended services and capitalized on new opportunities to enhance their networks. In the prominent London market, American, United, and jetBlue launched new flights in 2022, amplifying the competition to a total of six airlines. Notably, Icelandair increased departures to Reykjavik in 2022 by more than 50 percent of its 2019 schedules. This was partially due to the entry of ULCC Fly Play (PLAY Airlines) into the market. Additionally, Delta Air Lines expanded its international presence at Logan Airport with flights to Athens and Rome.

By year-end 2022, traffic to Central and South American destinations remained well below 2019 operations levels. However, according to OAG Analyzer projected schedules, all the destinations served in these two regions prior to the pandemic will be reinstated in 2023.

Overall, the international passenger segment at Logan Airport lags in recovery compared to the domestic segment. This is largely a consequence of government travel restrictions as well as various geopolitical, global economic, and health-related issues. The recovery of international travel was unequally distributed across the regions served by the Airport. **Table 3-6** shows year-over-year changes in scheduled international passenger aircraft operations by market segment compared to 2019 levels, and the annual change since 2021.

Logan Airport served 50 nonstop international destinations in 2022, compared to 58 in 2019, and 28 in 2021.[22] In addition, the Airport has benefited from Delta Air Lines' and jetBlue Airways' commitment to expanding Logan Airport's international network in recent years. Logan Airport's scheduled international air service markets are shown in **Figure 3-12**.

Figure 3-12 International Non-Stop Markets Served from Logan Airport, 2022



# Location	# Location	# Location
1 Montreal, Canada	18 Bridgetown, Barbados	35 Sao Paulo, Brazil
2 Halifax, Canada	19 Panama City, Panama	36 Amsterdam, Netherlands
3 Toronto, Canada (Billy Bishop)	20 Liberia, Costa Rica	37 Zurich, Switzerland
4 Toronto, Canada (Pearson)	21 Terceira, Portugal	38 Frankfurt, Germany
5 Bermuda	22 Calgary, Canada	39 Munich, Germany
6 Nassau, Bahamas	23 Ponta Delgada, Portugal	40 Rome, Italy
7 Providenciales, Turks and Caicos	24 Vancouver, Canada	41 Copenhagen, Denmark
8 Puerto Plata, Dominican Republic	25 Reykjavik, Iceland	42 Athens, Greece
9 Santiago, Chile	26 Lisbon, Portugal	43 Istanbul, Turkey
10 Punta Cana, Dominican Republic	27 Shannon, Ireland	44 Tel Aviv, Israel
11 Santo Domingo, Dominican Republic	28 Dublin, Ireland	45 Doha, Qatar
12 Montego Bay, Jamaica	29 Madrid, Spain	46 Dubai, UAE
13 Grand Cayman, Cayman Islands	30 Edinburgh, Scotland	47 Hong Kong
14 St. Maarten	31 London, U.K. (Heathrow)	48 Seoul, South Korea
15 Cancun, Mexico	32 London, U.K. (Gatwick)	49 Tokyo, Japan
16 Aruba	33 Barcelona, Spain	
17 St. Lucia-Vieux Fort, Saint Lucia	34 Paris, France	

Source: OAG Analyzer.

Note: In 2022, Logan Airport welcomed ULCC, Fly Play and Condor, which offered non-stop services to Reykjavik, Iceland and Frankfurt, Germany, both of which began in May 2022. ITA Airways (rebranded from Alitalia) commenced service to Rome, Italy, while United Airlines launched nonstop service London, United Kingdom in April 2022.

22 OAG Analyzer Schedules.

3.3 Cargo Volume Activity Levels in 2022

In 2022, Logan Airport ranked 25th among U.S. airports in total air cargo volume.[23, 24] Cargo volume increased to nearly 674 million pounds, representing a 3.8 percent year-over-year change. Air cargo is carried either in the compartments of passenger aircraft as belly cargo or by dedicated **cargo airlines**, such as FedEx, UPS, and DHL, in cargo-only aircraft. The express and small package segment remained dominant, accounting for 56.8 percent of non-mail cargo volumes. The freight segment increased the most over 2022, reaching approximately 279 million pounds. This was slightly below 2019 levels.

Table 3-7 shows cargo aircraft operations and cargo volumes at Logan Airport. The number of dedicated cargo aircraft operations at Logan Airport in 2022 exceeded 2019 cargo activity levels, while total cargo volumes remained below 2019 volumes.

Cargo shipments at Logan Airport have experienced a decline over the past two decades following its peak of over 1.0 million pounds in 2000. Cargo carriers, especially integrators[25] offering door-to-door delivery, have increasingly relied on trucks for deliveries over shorter distances. Ground transportation modes can be more cost-effective than air transport options, especially when shipments originate from carriers' superhub distribution centers. Additionally, the globally widespread adoption of the internet and email has significantly reduced mail volumes.

- FedEx was the largest cargo air carrier by cargo volume carried through Logan Airport in 2022, transporting over 277 million pounds.[26] This represented 41.2 percent of Logan Airport's total cargo volume.
- FedEx was the 11th largest air carrier at the Airport based on total flights in 2022. Although it was ranked 10th in 2021, it moved up from its position of 16th in 2019.
- UPS followed as the next largest cargo operator and accounted for 11.1 percent of Logan Airport's cargo volume in 2022.
- **Passenger airlines** carried the greatest share of Logan Airport's cargo as belly cargo in 2022. That year, commercial passenger airlines' share of cargo was 44.3 percent, or 298 million pounds, compared to 375 million pounds flown on exclusively cargo carriers (see **Figure 3-13**). This was a result of international flights and their associated belly cargo capacity returning to the market.

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

24 Air cargo includes express and small packages, freight, and mail.

25 Integrators are logistics companies that have end-to-end control of packages or deliveries, managing them from pick-up to drop-off. They operate their own fleets of trucks, planes, and sorting centers to ensure complete control throughout the process. Some of the globally recognized integrators include FedEx, UPS, and DHL, all of which have extensive fleets.

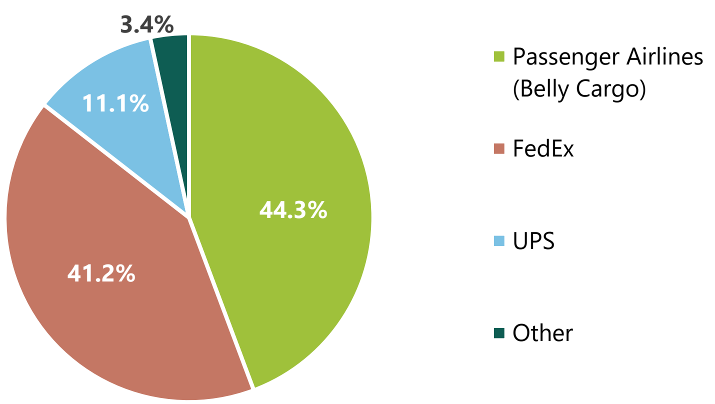
26 This includes express and small packages, freight, and mail.

Table 3-7 Cargo and Mail Operations and Volume, 2000, 2010, 2019–2022

Category	2000	2010	2019	2020	2021	2022	% Change (2021-2022)	2022 as % Above / Below 2019 Levels
Operations								
Cargo Aircraft Operations[1]	12,282	6,724	6,830	7,576	7,773	7,798	+0.3%	+14.2%
Volume (lbs.)								
Express / Small Packages	484,490,143	339,485,424	395,108,073	407,904,726	385,957,887	366,647,422	-5.0%	-7.2%
Freight	367,857,011	206,893,979	293,831,074	167,567,238	232,004,509	278,860,406	+20.2%	-5.1%
Mail	194,902,513	25,904,205	28,536,921	24,954,698	31,268,249	28,401,227	-9.2%	-0.5%
Total Cargo and Mail Volumes	1,047,249,667	572,283,608	717,476,068	600,426,662	649,230,645	673,909,055	+3.8%	-6.1%

Source: Massport.
Notes: Dedicated cargo operations only

Figure 3-13 Cargo Carriers – Share of Logan Airport Cargo Volume, 2022



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

3.3.1 Cargo Volume Trends in 2022

Despite the COVID-19 pandemic, in 2022 the global air cargo business had rebounded and operated close to pre-pandemic levels. The resumption of international passenger flights in 2022 increased cargo capacity and transport options, including both belly cargo and dedicated cargo freighter and integrator cargo activity. According to the International Air Transport Association (IATA), global air freight demand in 2022 slightly declined from 2021 levels but remained close to 2019 levels. After playing a crucial role in transporting medical supplies and other essentials like pharmaceuticals, life science products, perishable goods during 2020 and 2021, air cargo volumes declined due to geopolitical and economic uncertainties.

Despite the decline in freight volumes, e-commerce and express package markets became increasingly reliant on the speed of air shipping. Overall, DHL reported[27] economic indicators of high inflation that reduced purchasing power and resulted in lower demand for air freight. This was seen particularly in sectors that experienced lower sales and high inventory levels such as retail and manufacturing. However, logistics companies are diligently and actively addressing disruptions, working to overcome global and regional supply chain challenges, and striving to improve overall operations efficiency.

Air cargo volumes have shown more resilience to the pandemic than passenger traffic, although it is still too early to observe fully normalized trading patterns. According to the U.S. T-100 databases, the 10 largest U.S. cargo airports have experienced exceptional cargo growth rates, surpassing 2019 levels by approximately 3.0 percent in 2022.

Cargo volumes at Logan Airport showed a year-over-year increase of approximately 3.8 percent in 2022, returning to 93.9 percent of 2019 volumes. Although the domestic mail and express and small package markets remain an important share of cargo volumes, they declined in 2022. This was due to global supply chain challenges and inflation impacting demand within the online shopping and e-commerce sectors. Express and small package volumes at Logan Airport were less than 2019 levels at year-end 2022 and were 28.4 million pounds less than 2021 reported volumes. While mail volumes also decreased 9.2 percent in 2022 compared to 2021, they remained close to 2019 levels.

3.4 Future Aviation Activity Forecast Methodology

This section summarizes the methodology used to prepare the updated aviation activity forecasts presented in this *2022 ESPR*. The updated Logan Airport planning forecast incorporated considerations of both the near-term continued recovery from the COVID-19 downturn and the return to longer-term growth trends. The different considerations of near-term trends and longer-term trends are described in the following sections presenting the forecast results. These trends and assumptions, and the

27 DHL Insights. "Has COVID-19 Changed Asia's E-Commerce Landscape Forever?" https://lot.dhl.com/has-covid-19-changed-asias-e-commerce-landscape-forever/ and https://supplychaindigital.com/logistics/inflation-is-dampening-air-freight-demand-says-dhl.

forecasts derived from them, are important inputs into the analyses for noise, ground transportation, and air quality discussed in later chapters of the *2022 ESPR*. Massport's unique ESPR process allows and encourages development of frequent forecast updates. This facilitates use of the latest economic and aviation trends and the ability to adjust as conditions evolve.

The updated forecasts include a base year of 2022 to reflect the current status of the airline industry and emerging trends expected to influence future aviation activity levels at Logan Airport. Given the substantial changes over the past five years, and the uncertainty in predicting future aviation activity levels, a specific future forecast year is not used. Instead, Massport considers a **Future Planning Horizon** for a 10- to 15-year timeframe.

The future forecast was developed by applying standard industry forecasting techniques analyzing:

- Historical trends
- Recent developments, including the return to pre-COVID conditions
- Outlook for future demand drivers, such as the local and national economy

The forecast methodology was developed with reference to and consistent with industry best practices documented in the FAA's *Forecasting Aviation Activity by Airport*. This forecast guidance document identifies reliable data sources and accepted statistical analysis techniques, such as econometric analyses of the relationship between airport passengers and socioeconomic demand drivers. The FAA issues a **Terminal Area Forecast (TAF)** each year designed to assist the FAA in its regional planning, budgeting, and staffing requirements. The TAF forecasts are prepared at the individual airport level and are based on local and national trends, but are not reconciled directly to the national FAA Aviation Forecast. As a result, the TAF does not contain the local nuances and market-specific conditions that a site-specific forecast, such as developed for the ESPRs, can provide.

Additional, widely accepted aviation industry guidance that Massport follows for aviation demand forecasting includes:

- Annual editions of *FAA Aerospace Forecast*[28]
- Annual editions of *FAA Forecast Process for Terminal Area Forecast*[29]
- Annual editions of *Boeing - Commercial Market Outlook*[30]
- Quarterly editions of *Airports Council International (ACI) – Impact of COVID-19 on Airports and The Path to Recovery*[31]
- Semi-annual editions of *IATA – Global Outlook for Air Transport*[32]

28 FAA, 2023. FAA Aerospace Forecasts. Federal Aviation Administration, U.S. Department of Transportation. Website. Last updated May 8, 2023. https://www.faa.gov/data_research/aviation/aerospace_forecasts.

29 FAA, 2024. Terminal Area Forecast (TAF). Federal Aviation Administration, U.S. Department of Transportation. Website. Last updated January 22, 2024. https://www.faa.gov/data_research/aviation/taf.

30 https://www.boeing.com/commercial/market/commercial-market-outlook.

31 https://aci.aero/2023/02/22/the-impact-of-covid-19-on-airportsand-the-path-to-recovery-industry-outlook-for-2023/.

32 https://www.iata.org/en/publications/economics/.

- *Airport Cooperative Research Program (ACRP) Report 25 - Airport Passenger Terminal Planning and Design*[33]
- *ACRP Report 82 - Preparing Peak Period and Operational Profiles*[34]
- *IATA Airport Development Reference Manual (ADRM) 12th edition,* Chapter 2[35]
- *FAA's Office of Aviation Policy and Plans (APO) Advisory Circular (AC) 150/5070-6B Change 2, Airport Master Plans,* Chapter 7[36]
- *FAA APO Report - Forecasting Aviation Activity by Airport*
- *ACRP Synthesis 2 - Airport Aviation Activity Forecasting*[37]

This forecast, derived specifically for Logan Airport, serves as the basis for the planning and environmental evaluations and analyses in the later chapters of this *2022 ESPR*. The strategic planning forecasts include projections of both domestic and international air passengers; commercial passenger, cargo, and GA aircraft operations; and cargo volumes. **Figure 3-14** illustrates the forecast methodology for the *2022 ESPR*. The key elements of the methodology are detailed below:

- **Historical Aviation Data Review:** Review 20 years of data on summary trends in total passengers and aircraft operations at Logan Airport. Conduct a more detailed review of the most recent 5 years of passenger data since the previous *2017 ESPR* by activity categories, including domestic passengers, international passengers, passengers by airline, and passengers by world region.
- **Historical Socioeconomic Data Review:** Examine 20 years of data on regional population, employment, and **gross regional product (GRP)** for the Boston **Metropolitan Statistical Area (MSA)**, as well as growth trends for the nation as a whole.
- **Current and Planned Air Service Analysis:** Assess recent developments of airline air service at Logan Airport, both pre-pandemic and during the recovery.
- **Massport Consultations:** Knowledgeable staff provide input on airline service developments expected in the near future.
- **Economic Trends Forecast:** Review regional and national economic data and economic forecasts for use in an econometric analysis of the relationship between economic drivers and passenger levels.
- **Econometric Analysis:** Complete a statistical analysis of the relationship between underlying economic drivers and annual passengers at Logan Airport and the development of forecast long-term growth rates.

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33 https://crp.trb.org/acrpwebresource2/acrp-report-25-airport-passenger-terminal-planning-and-design-volume-1-guidebook/.

34 https://crp.trb.org/acrpwebresource2/acrp-report-82-preparing-peak-period-and-operational-profiles-guidebook/.

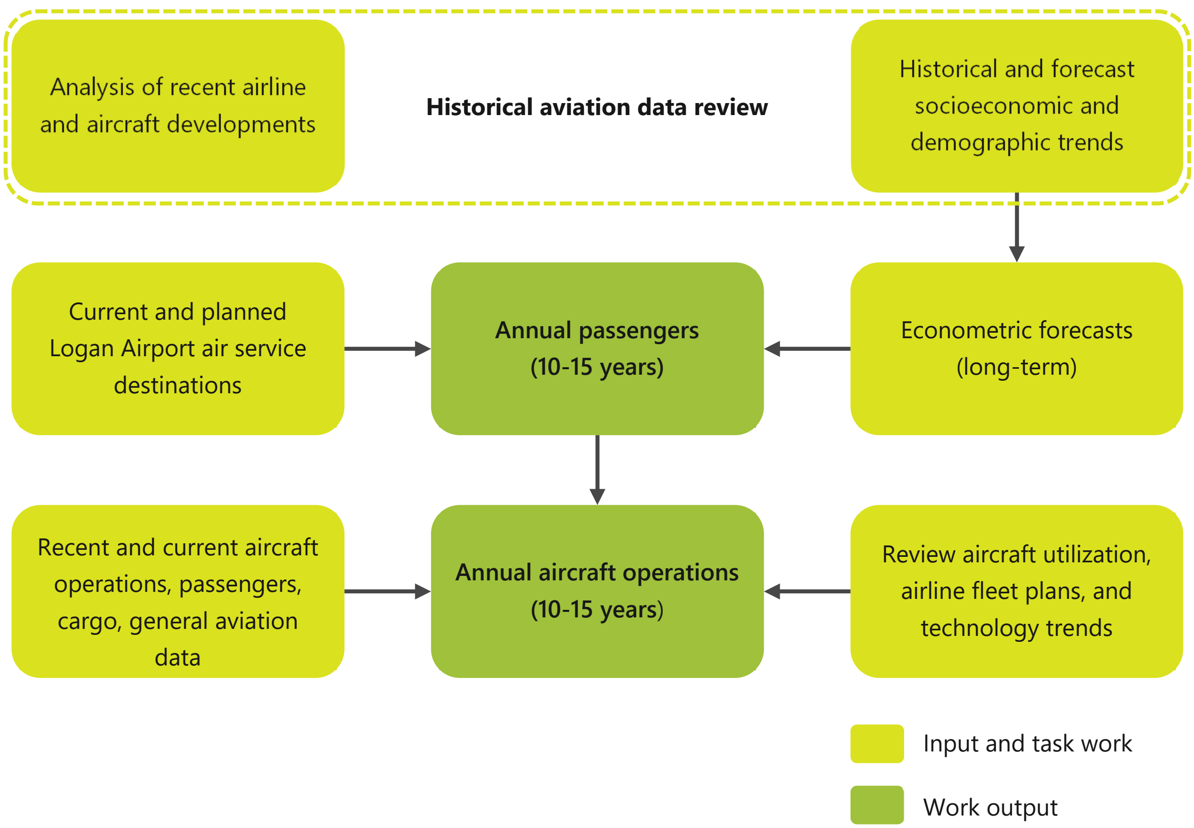
35 https://www.iata.org/en/publications/store/airport-development-reference-manual/.

36 https://www.faa.gov/airports/resources/advisory_circulars/index.cfm/go/document.current/documentnumber/150_5070-6.

37 https://nap.nationalacademies.org/catalog/23192/airport-aviation-activity-forecasting.

- **Annual Passengers Forecast:** Using the various analyses, derive the forecast of near-term passengers, based on pandemic recovery trends, and long-term forecast, based on econometric analysis and long-term historical trends.
- **Historical Aircraft Operations Analysis:** Assess historical aircraft operations at Logan Airport in the primary categories of passenger airline aircraft operations, cargo airline aircraft operations, and GA aircraft operations. Review aircraft operations data by aircraft type, in the main categories of large jet, RJ, and non-jet aircraft, as well as data on individual aircraft types.
- **Airline Fleets Analysis:** Assess airline aircraft fleets serving Logan Airport and aircraft orders for the future fleet. Review industry data on expected changes in future airline aircraft fleets; and
- **Annual Aircraft Operations Forecast:** Based on the relationship between annual passengers and annual aircraft operations, develop the forecast of annual aircraft operations by category.

Figure 3-14 Forecast Methodology



Source: InterVISTAS

Key Trends

Key factors used to inform the updated long-range planning forecast, including important trends in the regional economy and the national airline industry, are presented in Section 3.5. These trends are integral to the forecast methodology and analysis, and include:

- Regional economic trends – Historical and forecast economic growth in the Boston MSA, and comparison to national growth trends.
- Airline industry trends – Consideration of airline industry trends that could influence future aviation activity at Logan Airport, including:
  - COVID-19 recovery – Recent trends in recovery from the COVID-related downturn in aviation activity.
  - Airline competition – Analysis of airline competition, including the growth of LCCs.
  - Airline finances – Review of airline financial performance, and recovery of profitability since the COVID downturn; and
  - Aircraft fleets – Review of airline aircraft fleet changes in recent years, including aircraft retirements and transition to newer-generation aircraft.

3.4.1 Passenger Forecast Methodology

The passenger forecasts were prepared using accepted industry standard forecasting techniques analyzing historical patterns of passenger traffic at Logan Airport; recent trends at Logan Airport and in the airline industry; and the outlook for future aviation demand based on economic factors. The updated Logan Airport planning forecast incorporated considerations of both the near-term continued progress toward rebounding from the COVID-19 downturn; and the return to longer-term growth trends.

Analysis of recent airline service developments and passenger recovery trends were used to develop the near-term forecast of passengers. The COVID-19 downturn in passenger activity was unprecedented for Logan Airport and airports nationwide. This fact, combined with the significant renewal of activity over the past few years, makes it difficult to consider typical or traditional references to annual growth rates in the near-term, or to fully understand the relationship of annual passengers to underlying economic factors. Instead, the methodology for analysis of passenger traffic levels in the near-term is based on the assessment of absolute traffic levels, and particularly the return to pre-pandemic activity levels. Factors considered include:

- COVID-19 factors and the gradual reopening of travel markets;
- The revival of market segment demand for domestic and international air travel;
- Potential changes in passenger behavior, such as increased use of virtual communication during the pandemic; and
- Airline service responses to the patterns in returning demand.

Econometric analysis is used to examine statistical correlations between underlying drivers, also referred to as explanatory variables, and the ability to predict annual changes and levels in the dependent variable, in this case, Logan Airport passengers. Over the longer term, the forecast methodology assumed there would be a return to more typical passenger growth patterns exhibiting a more traditional relationship to underlying economic drivers, based on the econometric analysis of historical and pre-pandemic data trends.

The **econometric analysis** objective was not to develop a single "best" statistical equation to predict future conditions.

Rather, the analysis results inform assumptions regarding potential and **reasonable growth** of Logan Airport **over the Future Planning Horizon**.

The underlying economic drivers were used in different combinations and for different historical time periods to assess the statistical relationships between these drivers and annual growth in Logan Airport passenger levels, and to produce ranges of statistical coefficients for forecasting future passenger levels. Various reasonable arguments typically arise in support of using different underlying drivers or combinations of variables, as well as how different historical time periods are represented. Considering the unprecedented conditions and resulting limitations previously discussed, the objective of the econometric analysis was not to develop a single "best" statistical equation to predict future conditions, but instead to use the results of analysis to inform opinions and assumptions regarding potential and reasonable long-term growth of Logan Airport passenger levels.

3.4.2 Aircraft Operations Forecast Methodology

The aircraft operations forecast for Logan Airport was developed based on the forecast of annual passenger levels, expected trends in aircraft fleet composition, and key metrics such as average seats per aircraft and load factors. For example, an increase in the average number of passengers per operation, and the associated decrease in aircraft operations relative to passenger levels, would indicate an increase in the average number of seats per aircraft per operation as well as an increase in the average load factor value, or the percentage of seats occupied by passengers.

Data analysis methodology included inputs for annual aircraft operations by airline and aircraft type. This methodology also considers aircraft utilization by aircraft type, both before the pandemic and during the subsequent return to pre-COVID conditions. For the methodology, these historical trends were considered when developing the assumptions regarding future aircraft operations. Other information used in this methodology included industry forecasts of airline aircraft fleets, and aircraft orders by airlines serving Logan Airport. Section 3.5.3 presents the results of the forecast analysis.

3.4.3 Derivative Forecast Methodology

Using the top-level passenger and aircraft operations numbers, a series of **derivative forecasts** are derived to provide details for the detailed noise, air quality, and transportation forecast analyses. These derivative forecasts based on the Future Planning Horizon are important for supporting the technical analyses presented in the following chapters as shown in **Table 3-8**. The derivative forecasts include:

- Annual aircraft operations by aircraft type, which support air quality modeling.
- Average daily arriving and departing operations by aircraft type and stage length used to support noise modeling; and
- Peak month, average day arriving and departing O&D passengers by time of day, which supports **vehicle miles traveled (VMT)**[38] modeling.

The methodology to prepare derivative forecasts of activity at Logan Airport is based on industry standard practices. Detailed analysis of historical data is used to develop assumptions regarding the relationship of annual activity data to the more detailed derivative activity such as daily and hourly activity. These data sources include Massport airline activity reports; U.S. Department of Transportation (U.S.DOT) airline activity data reports; FAA aircraft operations reports; and airline schedule filings. Additional sources include analysis of activity metrics such as aircraft fleet share annual and daily, airline service domestic and international by season and airline use of terminals.

Based on these data inputs, assumptions were developed regarding future ratios of derivative activity in relation to annual activity, as reflected in the results presented in Appendix F, Section F.2. One key assumption includes the industry standard practice of peak demand flattening.[39] Additionally, the airlines are anticipated to use terminal facilities in the Future Planning Horizon similarly to today, so as international demand increases and new airlines initiate service, the utilization of Terminal E, Logan's international arrivals and departures terminal, is expected to increase relative to the other terminals. This aligns with the addition of four gates at Terminal E between 2022 and the **Future Planning Activity Level (PAL)**.

38 Vehicle miles traveled (VMT) measures the amount of travel for all vehicles in a specific geographic area over a specific period of time, typically a one-year period.

39 Peak demand flattening refers to when airlines plan operations so that demand growth occurs during less busy times of the day. This allows for increased service to markets as well as better utilization of terminal and airside facilities. As such, passenger demand over the course of the peak month average day planning period grows faster than the peak period.

Table 3-8 Forecasting Inputs, Assumptions, Models, and Outputs

	Ground Transportation	Noise	Air Quality and Emissions Reductions
Historical Inputs	• Passenger levels • Mode choice • Terminal usage • Automated traffic monitoring system (ATMS) • Roadway configuration and mileage • Parking garage and lot usage • Curb Dwell time	• Total aircraft operations • Aircraft fleet mix • Runway use • Radar flight lengths • Stage length • Night / Day operation	• Aircraft operations by aircraft and engine type • Aircraft taxi and delay • Ground service equipment (GSE) • Motor vehicle volumes, vehicle miles traveled (VMT), and curb usage • Energy usage • Stationary and other sources
Inputs from Forecast	• Average day of peak month (ADPM) – arriving and departing local passengers by terminal and time of day	• Annual average day (AAD) • Aircraft type • Origin and destination • Day / Night schedule	• AAD • Moter vehicle volumes, VMT and curb usage (from ground)
Future Assumptions	• Future mode choice • Future traffic volumes (based on MAP) • Future roadway configuration and mileage • Future parking garage and lot usage	• Runway use	• Future GSE use • Energy usage • Stationary sources
Model	• VISSIM Model	• FAA Aviation Environmental Design Tool (AEDT)	• AEDT • Motor Vehicle Emissions Simulator (MOVES)
Outputs	• Total traffic circulation by mode • On-Airport vehicle miles traveled (VMT)	• Current Day-night noise contours • Future Day-night noise contours • Population impact assessment for current and future conditions • Comparison of measured and modeled noise levels • Supplemental metrics	• Emissions Inventory

3.5 Future Aviation Activity Forecast Background

This section presents Massport's updated long-range planning forecasts for passenger activity levels and aircraft operations for Logan Airport, as required by the Certificate of the Massachusetts Secretary of the Executive Office of Energy and Environmental Affairs (EEA) issued January 30, 2023, which is provided in Appendix A, *MEPA Certificates and Responses to Comments*). The methodology is summarized in this section for the forecast results presented in this chapter with additional detail provided in Appendix F, Section F.2.

The updated forecasts include a base year of 2022 to reflect the status of the airline industry and emerging trends expected to influence future aviation activity levels, with a review of pre-pandemic conditions in 2019. The forecasts also consider both the near-term continued rebound from the COVID-19 downturn and the anticipated return to long-term growth trends. Given the dramatic changes in the past five years and the uncertainty in predicting future aviation activity levels, like previous ESPRs, Massport is using a Future Planning Horizon of a 10- to 15-year timeframe. The strategic planning forecasts include projections of passengers (domestic and international), aircraft operations (passenger, cargo, and GA), and cargo. To support the technical noise, ground transportation, and air quality analyses, derivative forecasts were developed that break down the overall forecast into greater detail to derive assumed aircraft fleet mix, flight schedules and destinations, and terminal usage. The forecast is presented below and serves as the basis for the planning and noise, ground access, and air quality analyses in this *2022 ESPR*.

3.5.1 Regional Economic Trends

To set the stage for this long-range planning forecast, important trends in the regional economy and the national airline industry are presented in the following sections. Logan Airport users are primarily O&D passengers, rather than passengers connecting through Logan Airport to reach their final destinations. The high percentage of O&D passengers at Logan Airport relative to other major airports used primarily as connecting hubs means that overall activity levels at Logan Airport are less vulnerable to fluctuations in connecting traffic resulting from airline-specific factors such as airline route restructuring.

Historically, activity levels at Logan Airport tend to reflect national economic conditions, regional economic and demographic trends, and the economics of the airline industry. Once the nation and the Boston region have fully recovered from the COVID-19 pandemic downturn, economics will largely determine long-term aviation market growth at Logan Airport as has been the case over time.

The Boston MSA is defined by the U.S. government to include the five Massachusetts counties of Essex, Middlesex, Norfolk, Plymouth, and Suffolk and the two New Hampshire counties of Rockingham and Strafford. According to census data, the Boston MSA is the tenth largest in the U.S. by population. The Boston MSA is among the nation's leaders in the areas of finance, technology, bioscience, healthcare, and education--economic sectors that contribute to above-average income levels and travel demand. The average income level in the Boston MSA was about 45.0 percent higher than the national average as of 2022.

Table 3-9 shows historical and projected growth in economic product and personal income for the Boston MSA and the nation. As shown, the Boston MSA has historically experienced economic growth exceeding national averages as measured between 2002 and 2022. This trend is projected to continue, from 2022 to 2042.

The projected continued economic growth in the Boston MSA, and in particular the participation in leading industry sectors that contribute to income growth and travel demand, is expected to continue to drive activity at Logan Airport.

Table 3-9 Historical and Projected Growth in Economic Product and Personal Income

	2002-2022	2022-2042
GDP/GRP		
U.S.	2.0%	2.0%
Boston MSA	2.3%	2.1%
Per Capita Income		
U.S.	1.5%	1.5%
Boston MSA	1.9%	1.6%

Source: Woods & Poole

3.5.2 Airline Industry Trends

This section provides information on the airline industry trends affecting future aviation growth nationally and at Logan Airport. This includes airline industry advancements since the COVID-19 downturn, and comparison of the post-pandemic upward trends at Logan Airport with national trends as well as more general indicators of historical and future aviation activity, including airline competition, airline profitability, aircraft fleet composition changes, and regional airports. Airline industry trends include, as noted, data reported airport and airline trade organizations including the ACI and IATA, and the U.S.DOT.

3.5.2.1 COVID-19 Recovery and Industry Outlook

The U.S. airline industry has exhibited a strong rebound from the COVID-19 economic downturn that began in March 2020. According to ACI, total U.S. passengers reached 98 percent of pre-pandemic 2019 levels as of March 2023, with domestic passengers at 100 percent of 2019 levels and international passengers at 91 percent of 2019 levels. ACI has projected that North American passenger traffic will exceed pre-pandemic 2019 levels in 2024. IATA forecasts that global passenger levels are also expected to return to pre-pandemic levels in 2024.

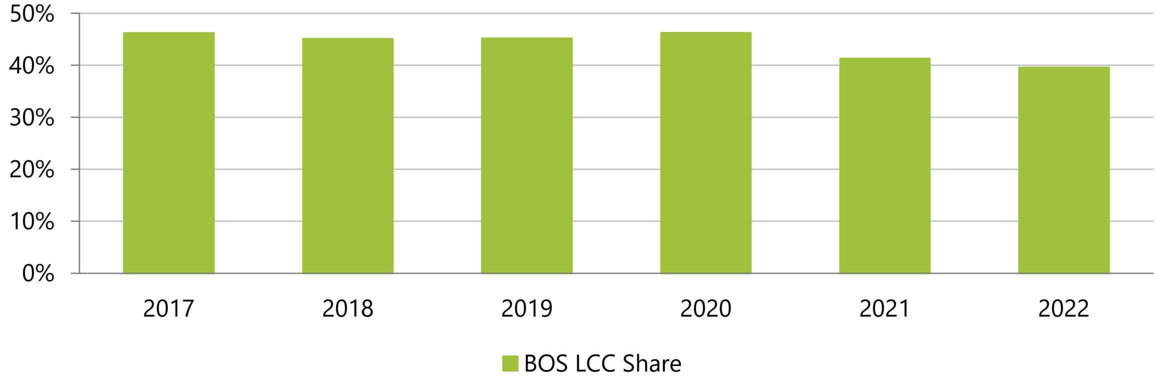
The actual number of passengers at Logan Airport in 2022 represented 85 percent of pre-pandemic 2019 passenger numbers. Airline service filings through September 2023 indicated passenger activity at Logan Airport was approximately 95.0 percent of 2019 passenger activity levels by the end of 2023. Thus, passenger activity at Logan Airport is expected to meet or exceed pre-pandemic levels in 2024 or 2025. Beyond 2025, aviation activity at Logan Airport is anticipated to resume the long-term growth trends driven primarily by underlying economic growth.

3.5.2.2 Airline Competition and Industry Structure

The U.S. airline industry is extremely competitive, and over time there are developments which affect industry dynamics. These include new entrant airlines, airline cooperation and mergers, airline failures, and general competitive adjustments and strategic decisions around each airline's share of service at airports. These factors impact the industry's structure and the market shares of individual airlines nationwide and at each airport. Over the long-term, strong O&D airports such as Logan Airport tend to continue to attract and retain airline service providers based on underlying economic factors, although the mix of individual airlines may fluctuate.

Legacy carriers and their affiliated regional airlines continue to account for the majority of total domestic air travel activity, which was about 64.0 percent in 2022. The remaining 36.0 percent was accounted for by LCCs. The growth of LCCs has contributed to competition and traffic growth in the U.S. airline market. Examples of LCCs operating at Logan Airport include Allegiant Air, Frontier Airlines, jetBlue Airways, Southwest Airlines, and Spirit Airlines. **Figure 3-15** shows the share of domestic passengers at Logan Airport who fly with LCCs for the period between 2017 and 2022.

Figure 3-15 Low-Cost Carrier Shares of Domestic Passengers at Logan Airport, 2017-2022



Source: U.S. DOT, T-100 database.

At Logan Airport, the share of domestic passengers represented by LCCs increased significantly from 22.0 percent in 2007 to 46.0 percent in 2017. This increase was driven primarily by jetBlue Airways service development and the airline's focus on the Boston market during this period. After 2017, the LCC share at Logan Airport remained around 45.0 percent until the COVID-19 pandemic. In 2021 and 2022, the LCC share at Logan Airport was somewhat lower at around 40.0 percent, due to uneven recoveries among individual airlines. However, this still represented a significant share of the Airport total domestic passenger levels. It is anticipated that LCCs will continue to account for a significant share of domestic passengers at Logan Airport, consistent with the range of domestic passenger shares exhibited in the past five years.

Other recent developments affecting competition at Logan Airport include the "Northeast Alliance" codeshare arrangement between American Airlines and jetBlue Airways at airports in Boston and New York, and the proposed merger of jetBlue Airways and Spirit Airlines. In May 2023, the U.S. Department of Justice ordered termination of the Northeast Alliance, citing concerns over limits on competition, and jetBlue Airways has indicated its intent to comply with the ruling.

Overall, while there is likely to be additional airline competition in the future, it is expected that these will primarily affect the shares of individual airline passengers at Logan, and not overall demand for air travel, which is responsive to underlying drivers such as socioeconomic conditions. This is because of the Airport's role serving primarily O&D passengers.

3.5.2.3 Airline Finances and Profitability

After a sustained period of profitability from 2010 to 2019, the U.S. airline industry experienced major financial losses in 2020 and 2021 due to the COVID-19-related travel downturn beginning in 2020, which can be seen in **Figure 3-16**.

In 2022, the U.S. airline industry reported a modest operating profit due to continued traffic demand recovery and airline structural adjustments. ACI reported an optimistic outlook for U.S. airlines' financial results by year-end 2023, reflecting a return to pre-pandemic passenger activity levels nationwide, or possibly exceeding them. IATA forecasts that profits for airlines globally should be positive by 2024. Although the recovery from COVID-19 is uneven when considering the global aviation industry, North America reported to be in the lead. It is assumed that, while subject to cyclical changes, the airline industry will generate sufficient financial results to serve market demand over the next 10 to 15 years.

3.5.2.4 Regional Airport Competition

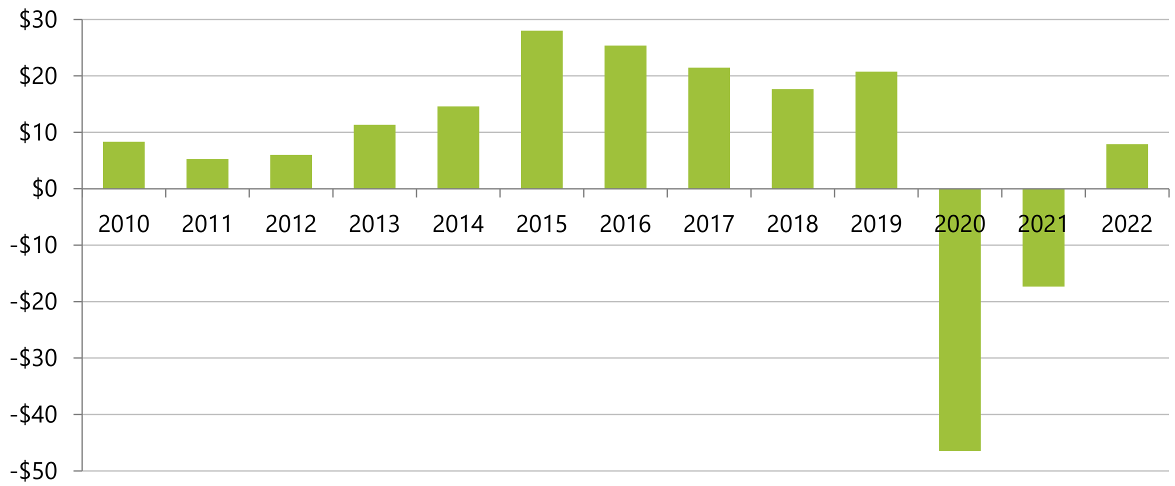
Large metropolitan areas in the U.S. frequently have multiple commercial airports that can compete for regional passenger demand. In the Boston area, the closest regional airports to Logan Airport are T.F. Green Airport in Rhode Island and Manchester-Boston Regional Airport in New Hampshire. From 2012 to 2022, the share of regional passengers at Logan Airport increased from 83.0 percent to 88.0 percent, attributed significantly to the development of LCC service offerings at Logan Airport by jetBlue Airways and others, and the relatively greater number and geographical diversity of airline services at Logan Airport.

3.5.2.5 Aircraft Fleet Changes and Average Seats per Aircraft

The COVID-19 downturn led to airlines grounding and retiring significant portions of the U.S. airline fleet beginning in 2020, as well as defer or extend orders scheduled for future delivery. This accelerated the transition to cheaper and more modern, efficient aircraft as demand recovered and airlines resumed ordering and taking delivery of new aircraft.

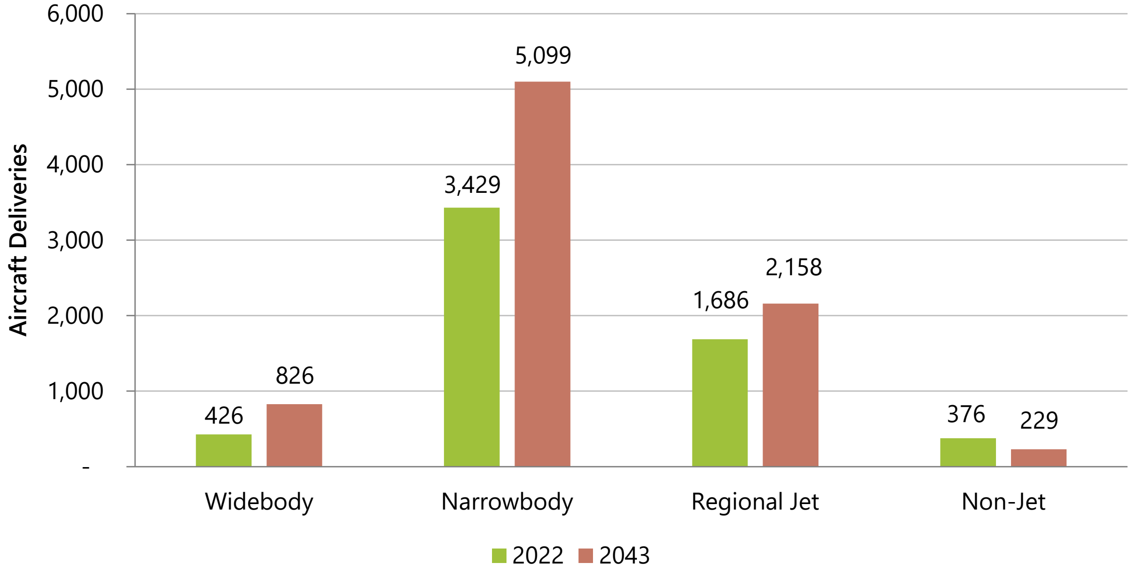
The long-term trend in aircraft fleet development in the U.S. airline industry is focused substantially on **narrowbody aircraft**. As of 2022, narrowbody aircraft represented about 60.0 percent of U.S. airline aircraft operations, and about 65 percent of Logan Airport aircraft operations. Within the narrowbody aircraft category, airlines can gradually increase average seating capacity per aircraft, particularly with transition to newer generation narrowbody aircraft. These aircraft provide greater average seating capacity than the aircraft they replace. These newer generation narrowbody aircraft include the Airbus A321neo and the Boeing 737 MAX.

Figure 3-16 Annual U.S. Airline Operating Profits in Millions of U.S. Dollars, 2010-2022



Source: U.S. DOT, Bureau of Transportation Statistics.

Figure 3-17 Forecast Change in U.S. Airline Fleet, 2022-2043



Source: FAA Aerospace Forecast, Fiscal Years 2023-2043

Airlines are also using newer-generation narrowbody aircraft to replace older, smaller, and less popular RJ aircraft. For example, large **network airlines** are phasing out 50-seat RJs, and jetBlue is taking delivery of new Airbus A220 aircraft to replace its smaller Embraer 190 aircraft.

According to FAA and as shown in **Figure 3-17**, U.S. passenger airlines will add about 1,600 narrowbody aircraft between 2022 and 2043, compared to about 400 widebody aircraft. This forecast is based on the combination of new aircraft deliveries and retirements. U.S. regional carriers are projected to add about 400 regional aircraft, primarily larger RJs.

The number of average seats per aircraft operation at Logan Airport has historically increased over time. Between 2010 and 2019, the number of average seats available to convey passengers per aircraft operation increased from 108 to 130. With the pandemic-related decline in international flights, the average number of seats decreased slightly to 126 in 2021 as larger aircraft with more seats are generally associated with international or long-haul flights. The absence of these aircraft from the service fleet shifted the average to a lower number. With resumed activity, the average number of seats increased back to 132 in 2022 as larger aircraft came back into service. The trend of increasing average seats per aircraft operation has led to airlines utilizing the Logan Airport airfield more efficiently with more passengers per flight operation and generally fewer environmental impacts.

The average number of seats per aircraft operation at Logan Airport is expected to increase in future years, based on the fleet evolution trends described above. Specific assumptions regarding future average seats per departure are presented in Section 3.5.5.

3.5.3 Updated Logan Airport Future Planning Activity Level Forecast

Massport periodically assesses and updates planning forecasts due to global and local economic and market conditions that have an impact on aviation activity levels. As shown in **Table 3-3** in Section 3.1.2.1, Logan Airport's passenger traffic increased from 27.7 million air passengers in 2010 to 45.2 million in 2019. The long-term growth was attributable to underlying regional and national economic growth and airline service development at Logan Airport. With the onset of the COVID-19 pandemic, passenger activity levels at Logan Airport declined to 12.6 million passengers by the end of 2020. Since then, passenger activity levels have increased to 36.1 million air passengers in 2022.

Since the publication of the *2017 ESPR*, the following developments that have affected aviation activity at Logan Airport include:

- Continued strong growth through 2019, reflecting the primary O&D base of Logan Airport passenger traffic and the strength of the regional economy.
- The unprecedented downturn during the COVID-19 pandemic began in 2020, at Logan Airport, nationally, and globally.
- Relatively strong recovery from the pandemic downturn as of 2022 and continued positive outlook.
- Continued service from the largest airlines at Logan Airport, supporting the on-going recovery from the COVID-19 downturn and the anticipated resumption of long-term growth; and
- Aircraft fleet retirements and transition to new-generation aircraft.

The updated Logan Airport planning forecast incorporated considerations of both: the near-term continued return to pre-pandemic conditions; and the return to longer-term growth trends. The different considerations of near-term trends and longer-term trends are described in the following sections presenting the forecast results.

3.5.4 Passenger Activity Level Forecast

The Boston metropolitan area has significant activity in leading economic sectors that produce above-average incomes and a high propensity for air travel. Logan Airport is principally an O&D airport, and future passenger activity is primarily determined by underlying market demand and not dependent on airlines **connecting passengers** that transfer from one flight to another. The price of air travel can also affect passenger demand, as shown by the growth associated with the development of LCC service at Logan Airport.

The Boston Metropolitan Area's economic growth is the primary driver of current and future air passenger growth at Logan Airport, which serves the **10th largest metropolitan area** in the nation.

Advances in technology also have the potential to impact passenger demand and growth. For example, aircraft manufacturers are developing electric and hypersonic aircraft, which may have increased efficiencies or could improve the travel experience. However, the long-term impacts of new technologies are still uncertain, so the Logan Airport passenger forecast is based on proven, traditional metrics and forecasting techniques. The passenger forecasts were prepared using standard industry forecasting techniques analyzing:

- Historical patterns of passenger traffic at Logan Airport;
- Recent trends at Logan Airport and in the airline industry; and
- The outlook for future aviation demand based on economic factors.

The updated Logan Airport planning forecast incorporated considerations of both the near-term continued recovery from the COVID-19 downturn and the return to longer-term growth trends.

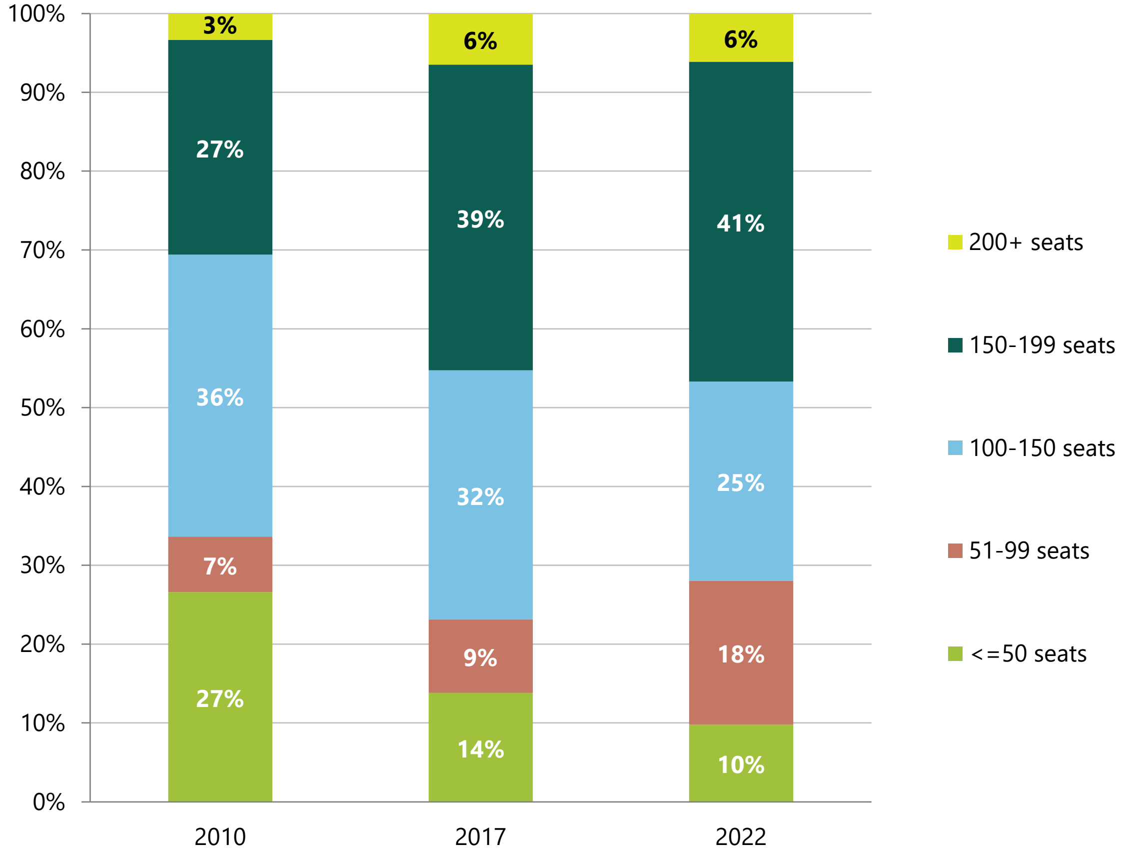
The COVID-19 downturn in passengers was unprecedented at Logan Airport and airports nationwide. Combined with the subsequent recovery of activity over the past few years, it is difficult to consider typical references to annual growth rates in the near-term. At Logan Airport, passenger levels declined by 70 percent in 2020 before recovering by 80 percent in 2021, albeit from a much smaller 2020 base level. Passenger levels increased again by 59 percent between 2021 and 2022. These are not percentage growth changes that can be related to average historical trends or underlying economic factors. Rather, the analysis of traffic levels in the near-term is based on the assessment of absolute traffic levels, and in particular the return to pre-pandemic activity levels and beyond. Most near-term airport traffic forecasts prepared since 2019 focus on the return to pre-pandemic levels first and then consider the recovery to anticipated long-term growth patterns. Forecast considerations included COVID-19 factors and the gradual reopening of travel markets; market segment demand recovery, for example, domestic and international travel demand; and airline service responses to the demand recovery patterns.

Figure 3-18 shows the significant annual passenger activity level increases from 2020 to 2022, reaching 85 percent of the 2019 levels in 2022, where 2019 is equal to 100 percent. This trend is forecast to continue through 2026, with annual percentage growth exceeding long-term average growth rates, but at the same time returning to at or slightly above 2019 levels. This pattern of near-term passenger growth is typical of large U.S. airports, although there are variations around the average.

In the longer-term, after COVID-19 recovery and assuming no other shocks to the industry, it is forecast that more typical and traditional passenger growth patterns and their relationship to underlying economic drivers will return. This is based on econometric analysis of historical, pre-pandemic data trends.[40] **Table 3-10** shows key input variables used in the econometric analysis of Logan Airport passengers.

40 Econometric analysis was used to examine statistical correlations between underlying drivers or factors, also referred to as "explanatory variables," and the ability to predict annual changes and levels in the dependent variable, in this case Logan Airport passengers.

Figure 3-18 Fleet Mix at Logan Airport, 2010, 2017, and 2022



Source: Inter*VISTAS*, from U.S. DOT T-100 data. Aircraft of 200+ seats are widebody, 100-199 seats are narrowbody, and less than 100 seats are regional jets and turboprops.

Table 3-10 Passenger Forecast Assumptions

Econometric Factor	Average Annual Growth
U.S. Gross Domestic Product	2.0%
Gross Regional Product	2.1%
U.S Per Capita Income	1.5%
Regional Per Capita Income	1.6%
Airfares	-1.0%

Source: InterVISTAS, Woods & Poole.
Notes: Regional is defined as the Boston MSA.

The underlying economic drivers were considered in different combinations and for different historical time periods to assess the statistical relationship to annual growth in Logan Airport passengers. They were also used to produce ranges of statistical coefficients for forecasting future passengers. There are typically various reasonable arguments in support of different underlying drivers or combinations of variables, as well as how different historical time periods are represented. The objective of the econometric analysis was not to develop a single "best" statistical equation, for reasons stated above, but to use the results of analysis to inform opinions and assumptions regarding potential and reasonable long-term growth of Logan Airport passengers.

Table 3-11 shows the forecast of Logan Airport passengers to a Future Planning Horizon of 10 to 15 years, based on the combination of the near-term and long-term trends described above. In this *2022 ESPR*, the Future PAL serves as the basis for assessing potential future environmental impacts of Logan Airport. Additionally, **Table 3-11** shows percentage change comparisons from both the most recent actual result in 2022, and the pre-pandemic peak in 2019.

Table 3-11 Actual and Forecast Logan Passengers, 1990, 2019, 2022, and Future Planning Horizon

Passengers	1990	2019	2022	Future Planning Horizon	% Change 2019-Future	% Change 2022-Future
Scheduled/Charter						
Domestic	19,519,247	34,098,788	29,527,910	41,826,300	+23%	+42%
International	3,358,944	8,317,993	6,450,000	11,556,000	+39%	+79%
Europe / Middle East / Africa	N/A	5,003,881	4,124,245	6,586,920	+32%	+60%
Canada	N/A	985,051	602,835	1,617,840	+64%	+168%
Latin America / Caribbean	N/A	1,727,057	1,573,468	2,311,200	+34%	+47%
Asia	N/A	602,004	149,452	1,040,040	+73%	+596%
Total Scheduled / Charter	22,878,191	42,416,781	35,977,910	53,382,300	+26%	+48%
General Aviation	N/A	105,630	112,806	117,700	+11%	+4%
Total Passengers	22,878,191	42,522,411	36,090,716	53,500,000	+26%	+48%

Source: Massport and InterVISTAS Logan Airport Forecast.

Domestic air passengers are forecast to increase from 29.5 million in 2022 to 41.8 million in the next 10 to 15 years. This is a significant increase from 2022, although a smaller increase compared to 2019 levels. The domestic share of total passengers was 80.0 percent in 2019 and 82.0 percent in 2022. This is contrary to the long-term trend of a somewhat decreasing share of domestic air travel as international routes and markets continue to develop. The change from 2019 to 2022 reflects the fact that domestic activity recovered more quickly than international activity from the pandemic downturn. In the Future Planning Horizon, it is forecast there will be a return to the trend of gradually reducing domestic share to 78.0 percent as international markets grow somewhat faster than domestic.

Total Logan Airport air passengers are forecast to increase from 36.1 million in 2022 to **53.5 million** over the course of the 10- to 15-year **Future Planning Horizon.**

International air passenger activity levels are forecast to increase from 6.45 million in 2022 to 11.6 million in the 10- to 15-year Future Planning Horizon. The share of international passengers decreased from 20 percent in 2019 to 18 percent in 2022, as international air travel was slower to recover from COVID-19 compared to domestic air travel. In the future, it is forecast that the share of international passengers will increase to about 22 percent. The forecast growth in the different international regions is based on the assessment of the near-term COVID-19 recovery, which has been uneven across regions, and assumptions regarding prospects for growth in relation to current market size. Europe is forecast to continue to account for more than half of all international activity. Asia is expected to exhibit strong growth from a delayed recovery base in 2022, particularly as newer routes are further developed.

GA passengers represent less than one percent of the total, and there is only a small amount of growth forecast in this category.

The recent COVID-19 downturn and resumption of passenger activity at Logan Airport, while much different in magnitude and severity, is consistent with the general experience and data presented earlier. These data show that historically Logan Airport is resilient to external shocks and periods of weak demand, and ultimately the long-term trend is positive despite interruptions. The strong regional economy, local O&D market, and diversified mix of airlines have made Logan Airport resilient to past external shocks and contributed to the on-going recovery from COVID-19.

3.5.5 Aircraft Operations and Fleet Mix Forecast

The total number of passengers at Logan Airport increased 53.0 percent from 2000 to 2019, while aircraft operations decreased 12 percent because of more efficient operations. The number of passengers per aircraft operation increased from 57 passengers per operation in 2000 to 100 passengers in 2019. After 2019, the number of passengers per operation decreased due to lower demand levels before increasing to 95 passengers per operation in 2022.

The historical increase in the average number of passengers per operation, and the associated decrease in aircraft operations relative to passengers, is due to increases in the average number of seats available per aircraft operation and average load factor, or percentage of seats occupied by passengers.

Total Logan Airport aircraft operations are forecast to increase from 389,000 in 2022 to **495,000** over the course of the 10- to 15-year **Future Planning Horizon**.

Between 2010 and 2017, the number of seats per operation increased from 108 to 127, as smaller RJs and turboprops were replaced with larger narrowbody aircraft of 100-200 seats. From 2017 to 2022, the number of seats per operation further increased from 127 to 132, due to a combination of factors (see **Figure 3-18**). These factors included: continued declines in small RJs; an increase in the use of large RJs such as Embraer 175; and continued growth of narrowbody aircraft numbers compared to the Airport's total aircraft fleet. Average load factors increased from 77.0 percent in 2010 to 82.0 percent in 2019, then decreased somewhat after 2019 due to the COVID-related downturn.

Average load factors are forecast to increase somewhat through the 10- to 15-year Future Planning Horizon but remain similar to 2019 levels as shown in **Table 3-12**. More significant in terms of future passengers per operation is the forecast increase in average seats per aircraft from 123 in 2022 to 129 in the Future Planning Horizon for domestic operations; from 196 to 204 for international operations; and from 132 to 141 for total Passenger Airline operations.

Table 3-13 shows the forecast of Logan Airport aircraft operations. Within the Future Planning Horizon, passenger aircraft operations are forecast to increase significantly above 2022 levels while increasing slight above 2019 levels. Passenger aircraft operations are forecast to account for over 90.0 percent of total Airport operations. Passenger jet aircraft continue to account for the largest share of operations. RJ aircraft will further increase, but within this category larger RJs will replace smaller RJ. Non-jet aircraft levels will increase from 2022 but remain below 2019 levels. These aircraft are assumed to continue to be used by airlines such as Cape Air to serve nearby markets.

Table 3-12 Average Load Factors and Seats, 2019, 2022 and Future Planning Horizon

	Average Load Factors			Average Seats per Operation		
	2019	2022	Future Planning Horizon	2019	2022	Future Planning Horizon
Domestic	82%	79%	84%	121	123	129
International	82%	77%	83%	188	196	204
Total	82%	79%	84%	130	132	141

Source: Inter*VISTAS*, from U.S. DOT T-100 database.

Table 3-13 Actual and Forecast Operations, 1990, 2019, 2022, and Future Planning Horizon

Category	1990	2019	2022	Future Planning Horizon	% Change 2019-Future	% Change 2022-Future
Passenger						
Jet	N/A	296,514	244,971	344,223	+16%	+41%
Regional Jet	N/A	49,417	60,891	67,939	+37%	+12%
Non-jet	N/A	45,492	34,449	40,763	-10%	+18%
Subtotal	N/A	391,423	340,311	452,925	+16%	+33%
Cargo	N/A	6,830	7,798	9,900	+45%	+27%
General Aviation	24,976	28,922	30,504	32,175	+11%	+5%
Total Operations	424,568	427,175	378,613	495,000	+16%	+31%

Source: Massport and Inter*VISTAS*.

Cargo aircraft operations are forecast to increase moderately above 2022 levels and continue to represent a relatively small share of total Airport operations. GA aircraft operations are forecast to increase only moderately, consistent with historical trends. while the total number of Logan Airport passengers are forecast to exceed the historical highs in the next 10 to 15 years, the forecast number of aircraft operations is still somewhat below the historical high of 507,000 in 1998. This is because of the continued increase in average passengers per operation, due to the increases in average seats per operation and load factor, as discussed earlier.

3.5.6 Future Cargo Forecast

Cargo activity is historically related to underlying economic growth but is also subject to different key factors when compared to passenger activity. Dedicated cargo airlines such as FedEx and UPS seek to optimize air express package delivery efficiency, with consideration of door-to-door customer preferences, while also factoring in the use of trucking networks with related tradeoffs of cost and speed. Belly cargo contributes to passenger aircraft flight revenue, but the aircraft routing priorities are determined by passenger demand.

At Logan Airport and nationwide, cargo activity did not decline during the COVID-19 pandemic to the same extent as passenger activity. While passengers largely "stayed home," economic activity continued. E-commerce increased in importance, producing continued demand for air cargo services. From 2019 to 2022, the level of air cargo at Logan Airport declined by only 6 percent.

Table 3-14 shows the forecast of cargo volumes at Logan Airport. Total cargo volume is forecast to increase moderately above 2022 levels to the Future Planning Horizon, and slightly above 2019 levels. The share of cargo carried by cargo airlines is forecast to remain around 55 percent of the total, with the remaining 45 percent carried as belly cargo.

Table 3-14 Actual and Forecast Logan Airport Cargo (in pounds), 1990, 2019, 2022, and Future Planning Horizon

Category	1990	2019	2022	Future Planning Horizon	% Change 2019-Future	% Change 2022-Future
Cargo	N/A	397,676,068	375,509,055	466,697,050	+17%	+24%
Belly Cargo	N/A	319,800,000	298,400,000	381,843,040	+19%	+28%
Total	**753,253,075**	**717,476,068**	**673,909,055**	**848,540,090**	**+18%**	**+26%**

Source: Massport and Inter*VISTAS*.

3.5.7 Comparison of Previous and Current ESPR Forecasts

Prior to this *2022 ESPR* forecast, the previous *2017 ESPR* presented a long-range planning forecast. Conditions and trends changed from 2017 to 2022, most notably the COVID-19 downturn and subsequent recovery. **Table 3-15** below compares the *2017 ESPR* planning forecast to the updated *2022 ESPR* planning forecast. The current *2022 ESPR* forecast of 53.5 million passengers is higher by about 3.4 million, or 7.0 percent, than the previous *2017 ESPR* forecast of 50.1 million passengers. The current *2022 ESPR* forecast of 495,000 aircraft operations is higher by about 8,600, or 2.0 percent, than the previous *2017 ESPR* forecast of 486,400 aircraft operations.

Forecast aircraft operations within the 10- to 15-year Future Planning Horizon is projected to remain below the historical peak for operations in 1998.

The *2022 ESPR* planning forecast has an average of 108 passengers per aircraft operation compared to 103 passengers per aircraft operation in the *2017 ESPR* forecast. The increase in passengers per operation is related to the anticipated continued increase in average aircraft size, based on the fleet mix trends discussed earlier. The 10- to 15-year Future Planning Horizon of the *2022 ESPR* is further into the future than the 10- to 15-year Future Planning Horizon of the *2017 ESPR*, and therefore reflects further evolution of the airline aircraft fleet, with generally the same broad themes.

Updates to the Future Planning Horizon forecasts will continue to be based on the most current trends and data available during the next ESPR cycle, approximately five years after this *2022 ESPR*, as necessary.

Table 3-15 Comparison of *2017 ESPR* and *2022 ESPR* Logan Airport Planning Forecasts

Activity	*2017 ESPR* Forecast	*2022 ESPR* Forecast	Absolute Difference	Percent Difference
Passengers	50,113,905	53,500,000	+3,386,095	+7%
Operations				
Jet (>100 Seats)	339,365	344,223	+4,858	+1%
Regional Jet (<100 seats)	62,857	67,939	+5,082	+8%
Non-Jet	45,079	40,763	+4,316	-10%
Cargo	7,377	9,900	+2,523	+34%
GA	31,685	32,175	+490	+2%
Total	486,364	495,000	+8,636	+2%
Percent of Total Operations				
Jet (>100 Seats)	69.8%	69.5%	-0.3	
Regional Jet (<100 seats)	12.9%	13.7%	0.8	
Non-Jet	9.3%	8.2%	-1.0	
Cargo	1.5%	2.0%	+0.5	
GA	6.5%	6.5%	0.0	
Total	100.0%	100.0%		
Passengers Per Operation	103	108	+5	

Source: Massport, Inter*VISTAS*.

3.5.7.1 Comparison to FAA Terminal Area Forecast

FAA prepares an annual TAF for commercial service airports in the U.S., including Logan Airport. The TAF forecasts are based in part on the FAA's national aviation forecast. The methodologies used to develop the Logan Airport 2022 passenger forecast and the FAA TAF differ slightly. The Logan Airport forecast incorporates short-term service assumptions incorporating discussions with airlines serving the Airport while also relying on traditional econometric modeling over the longer term. The FAA TAF methodology uses a general structure based on economic conditions and national aviation industry factors. The FAA considers a local airport forecast "reasonable" or "consistent" if it is within 10 percent of the FAA TAF in the 5-year forecast period and within 15 percent in the 10-year forecast period. The *2022 ESPR* forecast presented for Logan Airport is within 5 percent of the most recent FAA TAF for Logan Airport through the 10- to 15-year Future Planning Horizon.

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4. Airport Planning

Logan Airport is constantly evolving and adjusting to changing aviation business needs, updating and upgrading aging buildings and infrastructure, enhancing safety, improving operating efficiencies, and reducing operational and environmental impacts. This chapter of the *2022 ESPR* provides an opportunity for Massport to discuss the status of recently completed or ongoing projects and present Airport-wide planning concepts.

These projects and initiatives are grouped by Airport location, including the terminal areas, landside service areas which support the aviation activities, parking areas, and the airfield. The Chapter also discusses planning to improve ground access and measures to reduce vehicle trips by enhancing high-occupancy vehicle (HOV) options. Additional details on the Airport's transportation-related projects and planning concepts can be found in Chapter 6, *Ground Access*. Airport projects related to energy, sustainability, and resiliency, as well as Airport buffers and open space, are discussed in Chapter 2, *Sustainability, Outreach, and Environmental Justice*. Where relevant, a discussion of Airport-wide initiatives is also included.

For the *2022 ESPR*, projects in the planning phases are discussed as short-term (expected by 2028) or long-term (expected by 2035). Several projects discussed in previous **Environmental Data Reports (EDRs)** and ESPRs were deferred due to the pandemic. Special focus is placed on the status of these deferred projects, particularly those that incorporated measures to reduce operating or environmental impacts. This chapter updates the status of Logan Airport planning and development projects as of the end of 2022. **Table 4-1** presents the status of planning initiatives and ongoing projects on the Logan Airport campus, as well as planned projects. All Massport and tenant projects that trigger review thresholds under the **Massachusetts Environmental Policy Act (MEPA)** or the **National Environmental Policy Act (NEPA)** must undergo the appropriate, project-specific state review, federal review, or both.

This chapter reviews current and planned projects including:

- Ground Transportation and Parking Planning
- Terminal Area Planning
- Airside Area Planning
- Service Areas Planning

Logan Airport short- and long-term planning concepts are summarized in **Table 4-1**, and the associated project locations are illustrated in **Figure 4-1** with color-coded numerical identifiers for easy cross-referencing between the two. Appendix A, *MEPA Certificates and Responses to Comments* contains copies of the Secretary's Certificate for applicable projects mentioned in this chapter.

2022 Airport Planning Key Findings

The following details key findings of Airport Planning in 2022:

- Phase 1 of the Terminal E Modernization project was under construction in 2022.
- In 2022, Massport efforts to enhance roadway operations and safety included relocating **RideApp** services, such as Uber™ and Lyft™, to the Terminal B Garage. This provided 60 additional commercial parking spaces in the Central Garage, including four **electric vehicle (EV)** parking spaces and three Americans with Disability Act (ADA) compliant spaces.
- Massport continued to implement a robust parking management strategy to encourage HOV transit and shared-ride options to minimize environmentally impactful transportation modes.
- A roadway construction project to reduce on-Airport roadway congestion was in progress through 2022 and included on-Airport roadway improvements, Terminal C curb enhancements, construction of separate exit lanes for Terminal B, installation of a tunnel for the Terminal B garage, and improvements to the roadways connecting Terminals B and C. The project was substantially complete as of summer 2023.
- In 2022, Massport completed post-security connections between Terminals B and C, initiated feasibility studies for connections between Terminal A and Terminals B and E, and expanded passenger amenities following the completion of the Terminal B Modernization Project.
- Massport is exploring options to improve the layout of the North Service Area (NSA) by reorganizing critical airfield support equipment and storage facilities, replacing antiquated buildings, and optimizing **airside** circulation and ramps, including a new **fixed-base operator (FBO)** replacement building. Construction of an additional jet fuel storage tank and associated infrastructure in the NSA began in 2022 and is expected to be completed in 2024.
- Construction of the MEPA and Federal Aviation Administration (FAA) approved Logan Airport Parking Project in front of Terminal E, which was deferred during the pandemic, has begun preliminary design. The updated project program includes approximately 4,300 commercial revenue spaces in the terminal, which will help to reduce drop-off and pick-up trips. The proposed garage would be a nine-story structure, located strategically in the Airport's central terminal area for improved connectivity to both the existing parking complex and Airport roadways. The ground floor will serve as a space for limousines and private vehicle staging, and a new RideApp pick-up and drop-off area adjacent to Terminal E will help to further minimize on-Airport **vehicle miles traveled (VMT)**. The project will continue to comply with the **Logan Airport Parking Freeze**.

Table 4-1 Logan Airport Short- and Long-Term Planning Initiatives

ID	Project	Status as of December 31, 2022	Construction	
			Short-Term By End of 2028	Long-Term By End of 2035
Airport Ground Transportation/Parking Projects and Planning Concepts				
1	Logan Airport Parking Project in front of Terminal E (approximately 4,300 spaces)	Permitted	✈	
2[1]	Logan Airport Parking Project: Parking Freeze Studies (Airport-wide)	Complete (2019)		
3	Airport-wide RideApp Infrastructure Improvements and Policy	Complete (2022)		
4[1]	Logan Express Route and Facility Expansions (off-Airport)	Feasibility / Planning	✈	✈
Terminal Area Projects and Planning Concepts				
1	Terminal E Modernization (Phase 1 – 4 gates / Phase 2 – 3 gates)	Phase 1 – Complete (2023) Phase 2 – Permitted		✈
2	Terminal B Optimization	Complete (2022)		
3	Terminal C Canopy, Connector, and Roadway Projects	Complete (2023)		
4	Terminal A to B Airside Connector	Feasibility / Planning		✈
5	Central Heating Plant Conversion	Feasibility		✈
Airside Projects and Planning Concepts				
1	Runway Incursion Mitigation (RIM) Study and Comprehensive Airfield Geometry Analysis and Mitigation	Feasibility / Planning	✈	✈
2	Runway 9-27 Runway Safety Area (RSA) Improvement Project	Planning / Permitting	✈	
3	Runway 15-33 Rehabilitation Project	Complete (2023)		
4	Taxiway B North Rehabilitation	Construction (2024)	✈	
Service Area Projects and Planning Concepts				
1	Logan Airport, Equipment Storage and Maintenance North Service Area (NSA)	Planning / Permitting	✈	
2	Jet Fuel Storage Addition (NSA)	Under construction	✈	
3	Green Bus Depot Relocation – Southwest Service Area (SWSA) Redevelopment	Feasibility		✈
4	Governors Island Equipment Storage	Feasibility		✈
5[1]	Relocated Compressed Natural Gas (CNG) Station – North Cargo Area (NCA)	Planning	✈	
6[1]	Cargo Through-put Facility	Feasibility / Planning		✈
7[1]	Replacement Cargo Facilities (NCA)	Feasibility		✈
8[1]	Joint Operations Center (JOC)	Feasibility / Planning		✈

Notes: Anticipated completion dates and status as of December 31, 2022, as denoted by ✈.
Short-term projects are anticipated to be constructed by 2028 and long-term projects are anticipated to be constructed by 2035. Details of each project or planning concept are provided in the sections that follow.

1 Not applicable; project and initiative is either Airport-wide or a location has yet to be identified.

Figure 4-1 Location of Airport Projects and Planning Concepts

2022 Environmental Status and Planning Report

Location of Project/Planning Concept. Color and ID match to Table 4-1.

Service Areas

Parking Facilities

Terminal Buildings

0 1,200 2,400 Feet

4.1 Ground Transportation and Parking Planning

Ground access and parking remain priority planning interests, with a focus on improving on-Airport roadway operations, safety, and congestion management, managing parking supply, managing RideApp services such as Uber™ and Lyft™, and promoting an increase in HOV services offerings and ridership

Several projects aimed at providing on-Airport **roadway congestion relief** were under construction or substantially completed by the summer of 2023, namely:

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

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

Massport's long-standing **Parking Management Strategy** focuses on parking supply, pricing, and operations to promote HOV, transit, and shared-ride use, thereby reducing environmental impacts.

Construction of the MEPA and FAA joint-approved Parking Garage Project in front of Terminal E was deferred during the pandemic, but as passenger demand has rebounded, the demand for commercial parking has again increased. In late 2023, Massport moved into the preliminary design process for the garage, taking current conditions into account. Through this process, Massport has reconfirmed the need for additional parking spaces to encourage long-term parking at the Airport. By utilizing long-term parking, passengers would make one trip to the Airport and one trip to leave, rather than two trips for drop-off and two trips for pick-up. The updated program for the project now calls for approximately 4,300 commercial revenue spaces, which would be built in a new garage in front of Terminal E; however, no parking spaces will be constructed atop the Economy Garage, as illustrated in **Figure 4-2**.

Figure 4-2 Proposed Footprint of Logan Airport Parking Project

Terminal Buildings
Proposed Garage
Proposed Roadway Improvements

Notes: See Table 4-2 for a description of project.
Status as of 12/2022.
Source: Nearmap (November 2022)

Located in the central terminal area of the Airport, the new Garage will be built away from the Airport perimeter and will improve connectivity to the existing parking complex and Airport roadways. The updated Garage in front of Terminal E will continue to comply with the Logan Airport Parking Freeze and will allow Massport to recover 2,000 spaces that were formerly located in Central Garage and in Terminal B Garage, but were lost due to HOV and RideApp initiatives at Terminals C and B.

As of this filing, Logan Airport accommodates 7,000 commercial spaces below the Logan Airport Parking Freeze. With the new garage, the Airport will remain approximately 3,000 commercial spaces below the Logan Airport parking freeze limit.

In 2022, more than a quarter of on-Airport traffic was from activities related to **RideApp operations,** which contributed to congestion on Airport roadways. In 2022, Terminal B RideApp pick-up and drop-off operations from the ground floor of the Central Garage were moved to the second floor of the Terminal B Garage. The shift provided approximately 60 more parking spaces, including three ADA accessible and four EV spaces in the Central Garage. Since 2017, Massport has tracked RideApp services, like Uber™ and Lyft™, which increase Airport traffic congestion and impact other modes of transportation. To manage increasing RideApp use, Massport has and will continue to develop strategies to facilitate efficient operation of all modes of ground transportation. This includes a RideApp **rematch** and shared ride program; fee structure changes to encourage shared rides and competition between modes; and the optimization of RideApp operations to manage operations and reduce empty or **deadhead trips**. Additional details on these initiatives can be found in Chapter 6, *Ground Access*.

Massport has a robust strategy to **promote HOV ridership**, which includes ongoing operational and capital commitments to the Logan Express bus services, the **Massachusetts Bay Transportation Authority (MBTA)** Silver Line 1 (SL1) service, and MBTA Blue Line station shuttles, as well as continued partnerships with private bus carriers. In 2021 and 2022, following the COVID-19 pandemic-related shutdowns, Logan Express services were restored as Airport activity levels and ridership recovered to pre-pandemic levels.

As passenger activity recovers from COVID-19, Massport restored service and restarted select postponed projects, and projects prioritized based on passenger needs and user demand as follows:

- **Suspended Logan Express service** from Peabody, Woburn, and Back Bay: Services restored in 2022.
- **Logan Express headways** reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and New Quincy lot is helping to increase passenger capacity at Braintree as well as a parking expansion at Framingham, which is also helping to improve passenger use.
- Postponed construction of additional parking at **Framingham Logan Express**: Project resumed and is in the design phase with construction currently estimated to begin in 2024.
- **New Logan Express suburban location**: Peabody Logan Express at new North Shore location opened in 2022. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing Back Bay Logan Express. Danvers Logan Express is expected to open towards the end of 2024.
- **Dedicated High Occupancy Vehicle (HOV) bus lanes**: HOV prioritization initiatives, including HOV bus lanes, are underway throughout Logan Airport campus.

The MBTA recently procured and began operating a new fleet of Silver Line buses, and Massport purchased ten buses for the SL1 route between South Station and the Logan Airport terminals. Massport will purchase ten new Silver Line buses as part of a forthcoming (Spring 2023) MBTA procurement. **Table 4-2** describes plans for ground access projects and commercial parking projects at Logan Airport.

Table 4-2 Description and Status of Airport Ground Access Projects and Planning Concepts, as of December 31, 2022

Description	Status
1. Logan Airport Parking Project	
In 2018, MassDEP and the U.S. EPA approved an amendment to the Logan Parking Freeze to add an additional 5,000 parking spaces at Logan Airport. Following the amendment to the Parking Freeze, Massport filed with the MEPA Office and FAA for new parking in two Airport campus locations in a new Garage across from Terminal E (2,000 spaces), and additional floors at the Economy Garage (3,000 spaces). The Project was put on pause during the pandemic, and planning is now progressing due to a rebound in passenger demand. The revised Parking Garage Project will now accommodate approximately 4,300 spaces in a nine-story facility in front of Terminal E, with commercial parking beginning on the second floor.	• MassDEP approved a parking increase on June 30, 2017. The U.S.EPA proposed a rule to approve the *Massachusetts State Implementation Plan* (SIP) revision on December 5, 2017. The final rule was issued on March 6, 2018, and became effective on April 5, 2018. • Massport filed an Environmental Notification Form (ENF) with Massachusetts Executive Office of Energy and Environmental Affairs (EEA) for new parking facilities on March 31, 2017. The Secretary's Certificate on the ENF was issued on May 5, 2017. • The Draft Environmental Impact Report (DEIR) and Environmental Assessment (EA) was published in May 2019. The Final EIR (FEIR) and EA was filed in November 2019. Massport submitted a joint FEIR-EA for NEPA and MEPA review in 2019. • The FAA issued a Finding of No Significant Impact (FONSI) in December 2019. The Secretary's Certificate was issued on January 30, 2020.

Table 4-2 Description and Status of Airport Ground Access Projects and Planning Concepts, as of December 31, 2022

Description	Status
1. Logan Airport Parking Project (*continued*)	
The new Garage will be connected to existing facilities: • New pedestrian bridges will connect from the garage to Terminal C Pier A and from the garage to the west side of Terminal E. • The existing pedestrian bridge between the West Garage and Terminal E will be dismantled for the portion within the footprint of the new garage and the walkway will be integrated into the Garage floor plan to allow for better vehicular and pedestrian circulation. • A vehicular bridge will connect the fourth level of the West Garage to the new garage. Several roadway enhancements will facilitate this project and also benefit the campus-wide roadway system. The proposed roadway and curbside reconfiguration will also achieve improved vehicle access, particularly for high-occupancy vehicles (HOV), at the curb, minimize dwell and idling time and reduce overall emissions: • The departures curbside will provide a second curb and three new lanes. • A new departures roadway dedicated for HOV use will connect Terminal C to Terminal E segregating HOV from other Airport traffic in this area • Other modifications to existing roadways will keep garage-related traffic off the Airport roadways, remove traffic waving in the Terminal B, C and E roadway area reducing congestion and emissions • Crosswalks will be reduced to two locations to enhance pedestrian safety and minimize the start/stop motion of vehicles under the current condition The Garage will include several sustainability features and will strive for ParkSmart™ certification, a sustainability rating system specifically for parking garages, including: • Photovoltaic Façade and Roof Panels • EV Charging Stations • Light emitting diode (LED) Lighting System including occupancy and daylight sensors • Energy management system • Automated parking guidance system	• Design efforts for these parking facilities were paused during COVID-19, but Massport has now resumed the design process. • Construction of the MEPA and FAA joint-approved Garage in front of Terminal E was deferred during the pandemic. As passenger demand has rebounded, the demand for commercial parking has again increased. • In late 2023, Massport moved into the preliminary design process for the garage, taking current conditions into account, and has reconfirmed the need for additional parking spaces to encourage long-term parking at the Airport, rather than two trips for drop-off and pick-up. As a result, the project was restarted and is proceeding through the early stages of the design process as of this *2022 ESPR* publication. • The updated program for the project now calls for approximately 4,300 commercial revenue spaces, which would be built in a new garage in front of Terminal E; no parking spaces will be constructed atop the Economy Garage. • Prior to filling the *2022 ESPR*, EEA notified Massport that the Secretary's Certificate on the FEIR would still be considered valid for the project as currently planned.

Table 4-2 Description and Status of Airport Ground Access Projects and Planning Concepts, as of December 31, 2022

Description	Status
1. Logan Airport Parking Project (*continued*)	
The updated Garage in front of Terminal E will continue to comply with the Logan Airport Parking Freeze and allow Massport to recover 2,000 lost spaces formerly located in Central Garage and in Terminal B Garage lost due to HOV and RideApp initiatives at Terminal B and Terminal C. As of this filing, Logan Airport accommodates 7,000 commercial spaces below the Logan Airport Parking Freeze limit. With the new garage, the Airport will remain approximately 3,000 commercial spaces below the Logan Airport parking freeze limit. The proposed Garage is in the preliminary design phase with construction expected to begin late in 2024 and be complete by the end of 2028. The footprint of the proposed Garage and extent of proposed roadway improvements is illustrated in Figure 4-2.	
2. Logan Airport Parking Project: Parking Freeze Studies (Airport-wide)	
In accordance with the June 2017 MassDEP approval and the April 2018 U.S.EPA approval to modify the Logan Airport Parking Freeze, Massport has advanced three key ground access studies. These include analyzing the feasibility and effectiveness of the following: • Potential services and improvements to HOV access; • Possible pricing strategies for different modes; and • Potential operational measures to further reduce drop-off and pick-up modes.	• The study findings were published in the Logan Airport Parking Project FEIR and Environmental Assessment (EA) in December 2019, which is available at Massport's website: https://www.massport.com/sites/default/files/2023-10/lapp_feirea_final_12132019.pdf. • These studies can also be accessed using links under the Boston Logan Active Projects heading on Massport's Environment website: https://www.massport.com/environment/project-environmental-filings/boston-logan.
3. Airport-wide RideApp Infrastructure Improvements and Policy	
Massport's plan to efficiently manage increasing RideApp service use includes a rematch and shared ride program, RideApp fee structure changes to encourage shared rides and competition between modes, and optimization of RideApp operations on-Airport to manage RideApp operations and reduce deadhead activity. Additional details can be found in Chapter 6, *Ground Access.*	• In 2019, Massport implemented reduced ride fees for shared rides and in 2020 a rematch program was introduced. • In 2022, Terminal B RideApp operations were moved from the Central Garage to the second floor of the Terminal B Garage. This provided 60 as commercial spaces in Central Garage, including three Americans with Disabilities Act (ADA) accessible and four EV spaces.

Table 4-2 Description and Status of Airport Ground Access Projects and Planning Concepts, as of December 31, 2022

Description	Status
4. Logan Express off-Airport Route and Facility Expansions	
Massport is investing in Logan Express to increase ridership and reduce VMT, congestion, and emissions at the Airport. These investments include improving Back Bay Logan Express service, improving existing suburban locations, expanding to new suburban locations, and increasing Braintree service frequency.	• Initiatives to expand Logan Express routes and facilities began in 2018 and 2019, including studies to improve ridership and service expansion. • In March 2020, service reductions were implemented due to the COVID-19 pandemic. • In 2021, several Logan Express services were restored, including the reopening of Woburn service and increased Braintree and Framingham service. • In February 2022, Peabody service reopened at a new location at the Northshore Mall. • Back Bay service was restarted in October 2022. • Danvers Logan Express is expected to open towards the end of 2024. Massport is considering other expansions to existing services and assessing feasibility of additional Logan Express locations.

Source: Massport.

4.2 Terminal Area Planning

The terminal area accommodates most of the passenger functions at Logan Airport, including the passenger terminals, terminal-area roadways, central parking facilities, and the Hilton™ Hotel. **Table 4-3** presents information on the status of ongoing terminal area project and planning concepts.

Enhanced post-security connections between Terminals B and C were completed in 2022 to optimize passenger movements and security. Other enhancements include expanded passenger amenities for current and future passenger needs. Feasibility studies of post-security connections between Terminal A and Terminal B, and Terminal A and Terminal E were also initiated. Other improvements included optimizing **Terminal B, Pier B facilities**, and continued construction on the **Terminal C Canopy, Connector, and Roadways Project**. These initiatives are shown as 2 and 3 in **Figure 4-3**.

Construction of the first phase of the Terminal E Modernization Project which added four gates[1] to the international terminal was completed in October 2023. Phase 2 will ultimately add three additional gates, for a total of seven gates. Phase 1 of the **Terminal E Modernization Program** incorporated key

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

sustainability elements, employing advanced building systems and renewable energy protocols resilient to changing environmental conditions.

In 2022, Massport completed upgrades to the **Terminal B, Pier B Optimization**, similar to the recent improvements at Terminal B, Pier A in 2022. The project responded to changing airline operations and improved the passenger traveling experience. These improvements included an enlarged ticketing hall, an enhanced outbound bag area, expanded baggage claim hall, larger concession areas, and increased holdroom capacity. The project consolidated American Airlines operations into one pier of Terminal B. The project also streamlined checkpoint operations for better passenger throughput and an improved passenger experience.

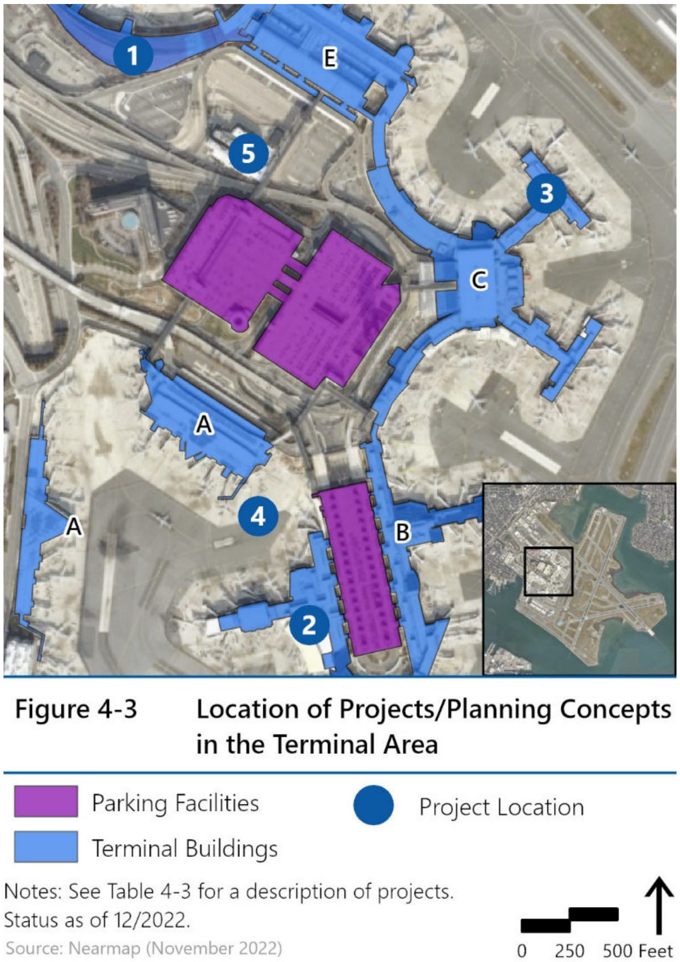


Figure 4-3 Location of Projects/Planning Concepts in the Terminal Area

Notes: See Table 4-3 for a description of projects.
Status as of 12/2022.
Source: Nearmap (November 2022)

In 2022, work continued on the **Terminal C Canopy, Connector, and Roadways Project**. The project included a post-security connector between Terminals B and C, replacing aging terminal roadways, improving Terminal C curb operations, and replacing the existing departures level canopy. The projects enhanced the Airport's ability to efficiently accommodate current and future passenger volumes by bringing the terminal facilities up-to-date and improving access, egress, and drop-off and pick-up operations. As a part of the projects, the "Old Tower" was removed to accommodate the roadway and curb enhancements.

As part of the ***Roadmap to Net Zero by 2031*** **(*Net Zero by 2031*)**, Massport is studying the feasibility of converting Logan Airport's Central Heating Plant (CHP) from fossil fuel to electricity or another alternative source of energy. The study will consider not only the CHP, but also the connections and equipment serving the terminals and other Airport buildings.

Massport is currently considering a post-security connector between Terminals A and B as a part of an ongoing Airport-wide effort to enhance post-security terminal connectivity.

Table 4-3 Description and Status of Terminal Area Projects and Planning Concepts, as of December 31, 2022

Description	Status
1. Terminal E Modernization	
The Terminal E Modernization Project adds the three gates originally approved in 1996, but never constructed, and an additional four gates. The building is aligned to function as a noise barrier and includes new passenger areas and holdrooms. Phase 1 of the modernization project was completed in Fall 2023 and includes four gates. The project includes sustainability features and is anticipated to achieve a minimum of Leadership in Energy and Environmental Design (LEED®) Gold status from the U.S. Green Building Council (U.S.GBC). The project includes integrated photovoltaics, and optimal harvesting of daylight all year round, well-insulated building envelope, recycled materials incorporated throughout, renewable energy sources that are used along with advanced building systems, including a solar-ready roof, which support net zero goals to minimize greenhouse gas (GHG) emissions. Construction of the Phase I led to the relocation of the on-Airport gas station from within the Project area to the intersection of Tomahawk Drive and Jeffries Street in the Southwest Service Area (SWSA). With input from the community-based Logan Impact Advisory Group, (LIAG), the design of the relocated station included a convenience store and landscaping. During the design phase, Massport also evaluated transportation and land-uses in the SWSA to reduce RideApp-related congestion along Tomahawk Drive. The RideApp Pool Lot was relocated to the existing Taxi Pool Lot at Porter Street, and the taxi pool lot was relocated to the Blue Lot between the Logan Office Center and the Hyatt™ Hotel. The RideApp pool lot's relocation provides more operational flexibility and additional routing options, allowing Massport to reduce RideApp service impacts along Tomahawk Drive.	• An Environmental Notification Form (ENF) was filed in October 2015 • A joint draft federal EA and state FEIR was filed in July 2016 in accordance with the NEPA and MEPA. • The FEIR and EA was filed on September 30, 2016. • The FAA issued a FONSI on November 10, 2016, and a Record of Decision (ROD) on November 14, 2016, stating that Massport can update the Airport Layout Plan (ALP) with the Terminal E Modernization Project. Copies of the Secretary's Certificates on the ENF, DEIRs and FEIRs, and EAs are included in Appendix A, *MEPA Certificates and Responses to Comments*. • Initial construction began in 2019 and the first four gates were opened in October 2023. A schedule to complete the remaining three gates and direct pedestrian connection to the Blue Line Airport Station has not yet been developed, and currently, Phase 2 of the project remains deferred. • The relocated gas station was approved as part of the Terminal E Modernization Project's MEPA and NEPA review process described above. • Construction was completed in 2019. • Massport relocated the RideApp Lot and Taxi Pool Lot in the fall of 2018. The project included traffic signal modifications along Harborside Drive.

Table 4-3 Description and Status of Terminal Area Projects and Planning Concepts, as of December 31, 2022

Description	Status
2. Terminal B Optimization	
Massport upgraded the Terminal B, Pier B facilities to meet changing airline operations and enhance passengers' traveling experience. Improvements include an enlarged ticketing hall, improved outbound bag area, expanded baggage claim hall, larger concession areas, and increased holdroom capacity at the gates. The project consolidated American Airlines operations to one pier, connecting all Pier B gates post-security.	• Massport prepared a Draft EA in May 2017 and a Final EA in June 2017. • The FAA issued a FONSI on June 29, 2017. • Project construction was substantially completed in 2022. • LEED® Gold was achieved in 2022.
3. Terminal C Canopy, Connector, and Roadway Projects	
Massport improved Terminal C facilities by providing a post-security connector between Terminals B and C, replacing aging roadways, improving Terminal C curb operations, and replacing the departures level canopy. As a part of the project, the "Old Tower" was removed to accommodate the roadway and curb enhancements. The project will separate passenger cars from buses at the roadway curbsides on the arrivals level at Terminal B. The modification includes moving the limousine pool from inside garage to the Level 2 horseshoe curbside, and relocating taxi and shuttle stands to the Piers A and B curbs on Level 1. The project will reallocate space for buses and shuttle buses at the Piers A and B curbs for optimization, improved passenger safety, and will provides ADA and accessibility improvements. The project includes new pavement markings, wayfinding signage modifications, lighting upgrades, and comprehensive structural repairs.	• The FAA issued a FONSI in November 2018. • Construction of the building enhancements and reconfigured roadway began in fall of 2019. • The "Old Tower" removal was completed in October 2020. • The replacement canopy construction was completed in 2021 with a slightly reduced program than originally planned. • The Terminal C to B Connector was completed in 2022. • The roadways were completed in 2023. • LEED® Gold was achieved in 2023.
4. Terminal A to B Airside Connector	
Massport is considering a post-security connector between Terminals A and B as a part of an Airport-wide effort to enhance post-security terminal connectivity.	• The airside connector between Terminals A and B is still being considered. The Project is currently in the feasibility/planning stage • The Project is not currently in the five-year Capital Program.
5. Central Heating Plant Conversion	
Massport is examining the feasibility of converting the Central Heating Plant (CHP) to non-fossil fuel sources of power.	• The study will consider not only the CHP, but also the connections and equipment serving the terminals and other Airport buildings.

Source: Massport.

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

Figure 4-4 Location of Projects/Planning Concepts on the Airside

Parking Facilities
Project Location
Terminal Buildings

Notes: See Table 4-4 for a description of projects.
Status as of 12/2022.
Source: Nearmap (November 2022)

0 675 1,350 Feet

4.3 Airside Planning

The airside area includes all Logan Airport land from the edge of the terminal buildings to the Airport harbor boundary (**Figure 4-4**). This area incorporates the Airport's apron, runways, gates, and other airfield operating facilities. Airside improvements include upgrades and improvements to the airfield, and enhancing operational efficiency and safety.

Nationally, the FAA continues working to enhance airfield infrastructure. A current focus is reducing runway incursions, which occur when an aircraft, vehicle, or person enters an airport's designated area for aircraft landings and take-offs. In 2019, Massport completed a comprehensive multi-year **Runway Incursion Mitigation Study (RIM**, or **RIM Study)** and Comprehensive Airfield Geometry Analysis in coordination with the FAA, to identify, prioritize, and develop strategies to help Massport mitigate incursion risk factors.[2] These factors include unclear taxiway markings and airport signage as well as runway or taxiway layout issues. The RIM Study analyzed the **Runway Safety Areas (RSAs)** at Logan Airport to confirm compliance with FAA standards, which require RSAs to accommodate aircraft overruns, undershoots, and veer-offs in emergency situations. Massport identified and prioritized airfield locations for safety improvement projects over the next 15 to 20 years, including taxiway relocations, runway rehabilitations, and RSA improvements.

Consistent with FAA requirements, Massport is continuously looking for opportunities to increase the margin of safety for runways and, where practicable, provide the FAA standard for RSAs at all locations. The standard RSA is typically 500-feet-wide by 1,000-feet-long at each runway end. Where this space is not available, FAA has approved the use of an **Engineered Materials Arresting System (EMAS)** for aircraft overrun and undershoot protection. An EMAS uses a system of collapsible concrete blocks that can stop an aircraft by exerting predictable forces on the landing gear while minimizing aircraft damage. Massport is working on final design and permitting for enhancement of the **RSA of Runway 27**.

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

The RSA improvements will include a pile-supported deck over Boston Harbor at the approach-end of Runway 27. Construction of the RSA improvements will be advanced once environmental permitting approvals are secured and design is complete. Initial environmental review and permitting commenced in late 2021. An **Environmental Notification Form (ENF)** was filed with the MEPA Office in August 2021 and the **Draft Environmental Impact Report (DEIR)** was filed in June 2022. The **Final Environmental Impact Report (FEIR)** and the **Environmental Assessment (EA)** filing under NEPA were filed in December 2022. Construction is currently projected for 2025 and 2026.

A recently completed runway improvement project was the **Runway 15R-33L Rehabilitation Project**. Pavement inspections and sampling indicated that the runway, last rehabilitated in 2021, required further rehabilitation. Project work included repaving the intersections with Runway 4L-22R and Runway 4R-22L and intersecting taxiways as well as modifying the taxiway pavement geometry at or near Runway 15R-33L. This work was completed in accordance with the latest FAA standards as well as the RIM Study and Comprehensive Airfield Geometry Analysis. The project also upgraded associated runway and taxiway lighting with energy efficient LED technology, pavement markings, and pavement sensors.

Massport is also exploring options to improve the layout and efficiency of the NSA by reorganizing the area's existing aviation uses. **Table 4-4** describes the status of these and other projects, as shown in **Figure 4-4**, and planning concepts under consideration for Logan Airport's airside area as of the end of December 2022.

Table 4-4 Description and Status of Airside Area Projects and Planning Concepts, as of December 31, 2022

Description	Status
1. RIM Study and Comprehensive Airfield Geometry Analysis	
The FAA undertook a nationwide comprehensive multi-year RIM program to identify, prioritize, and develop strategies to help airport sponsors mitigate risk.[1]	• Massport worked with FAA to identify areas that need to be enhanced and plan for the implementation of safety measures as identified in the RIM Study. • The study commenced in December 2016 and was completed in June 2019. • Recommendations from the study will continue to be implemented by Massport in the coming years.

Table 4-4 Description and Status of Airside Area Projects and Planning Concepts, as of December 31, 2022

Description	Status
2. Runway 9-27 RSA Improvement Project	
The RIM Study evaluated multiple alternatives for Runway 9-27 RSA enhancements and recommended construction of a deck, with an EMAS to meet the FAA safety requirements. The RSA improvements will include a pile-supported deck over Boston Harbor at the approach-end of Runway 27.	• The FAA approved the recommended alternative, which met safety requirements while minimizing environmental impacts. • An ENF was filed in August 2021. • The DEIR was filed in June 2022. • The MEPA FEIR and NEPA EA were filed in early 2023. A MEPA Certificate was issued for the FEIR and FAA issued a FONSI. • Following completion of the MEPA and NEPA processes, the Project is proceeding to federal, state and local environmental permitting. • A Request for Information (RFI) solicitation was issued in January 2024 and a Request for Proposals (RFP) for design build services will likely be issued late in 2024. • Construction is currently projected for 2025 and 2026.
3. Runway 15-33 Rehabilitation Project	
Last rehabilitated in 2021, Runway 15R-33L was further improved per FAA standards and the RIM Study. Improvements included repaving intersections with Runways 4L-22R and 4R-22L, runways, and taxiways; taxiway pavement geometry modifications at or near Runway 15R-33L, and upgrades to runway and taxiway lighting, pavement markings, and pavement sensors.	• Massport began design for the Runway 15R-33L rehabilitation and associated improvements in 2022. • Massport prepared NEPA documentation for the proposed project in accordance with FAA requirements. • Massport coordinated with applicable federal, state, and local agencies as part of NEPA review and the appropriate permitting processes. • Construction was completed in November 2023.
4. Taxiway B North Rehabilitation	
Massport is rehabilitating Taxiway B north to continue to comply with FAA standards. Improvements include: the northern portion of Taxiway B that travels parallel to (south of) Runway 15R-33L from Taxiway L to Taxiway N; the Bravo Taxilane, which extends northwest of Taxiway B from Taxiway L to the General Aviation ramp; and the North Cargo Taxilane adjacent to Terminal E Gates 10, 11, and 12.	• Massport prepared a Categorical Exclusion (CATEX) for FAA review under NEPA and is coordinating on the appropriate permitting processes. • Construction is expected to take place in Fall 2024.

Source: Massport.
Notes: See Figure 4-4 for the location of airside projects and planning concepts.
1 Information on FAA's RIM program can be found at https://www.faa.gov/airports/special_programs/rim/.

4.4 Service Area Planning

Logan Airport's service areas contain airline support operations and businesses. Land use in these service areas continues to evolve in response to changing airline business, customer, and tenant needs, as well as public works projects. Massport continues to explore ways to efficiently use the limited land resources in these service areas. Among several planned improvements, Massport is considering options to improve the layout of the NSA by reorganizing critical airfield support equipment and storage facilities, and enhance safety and efficiency of activities located within the runway protection zone (RPZ). In addition, construction of an additional jet fuel storage tank and associated infrastructure in the NSA commenced in 2022 and is expected to be completed in 2024.

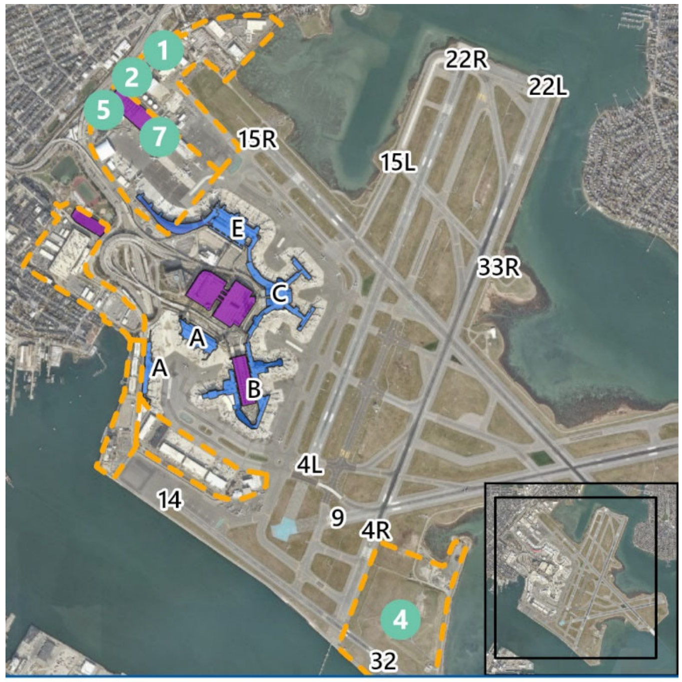


Figure 4-5 Location of Projects/Planning Concepts in Service Areas

Notes: See Table 4-5 for a description of projects.
Status as of 12/2022.
Source: Nearmap (November 2022)

The six service areas at Logan Airport are shown in **Figure 4-5** and are described below. Massport and Logan Airport tenants are proposing projects or exploring planning concepts to modernize and carry out future improvements to these areas. **Table 4-5** presents information on the status of each ongoing project and planning concept in the service areas.

- **North Cargo Area (NCA)** is in Logan Airport's northwest corner, adjacent to the airfield. It is bounded by the main Logan Airport outbound roadway to the south, Route 1A to the west, Prescott Street to the north, and Terminal E to the east. The NCA is the Airport's primary airline support area, and accommodates essential airline support businesses. These include hangars, **ground service equipment (GSE)**, maintenance facilities, air cargo, and aircraft parking.

  Portions of the NCA will continue to be used for economy parking, as described in Section 4.2.2. Massport continues to consider replacement cargo facilities in the area to compensate for cargo facilities lost due to the Central Artery and Tunnel (CAT) Project and to accommodate projected growth in cargo demand associated with Terminal E. In November 2023, Massport issued a Request for Quote (RFQ) solicitation to study the feasibility of and planning for a Cargo Throughput Facility to be constructed in the general vicinity of the State Police and the Facilities Maintenance Building 93, and the study would include considerations for the relocation of the State Police K -9 Facility. Construction phasing of the project is as yet undetermined.

- **North Service Area (NSA)** is north of Prescott Street and extends to the Green Bus Depot Site, the MBTA Wood Island Station, and Runway 15R End. The NSA includes two flight kitchens; weather and navigation equipment; the Green Bus Depot; Massport Facilities 2 and 3; the Large Vehicle Storage Facility; Hangar 5; the BOSFuel Fuel Farm; water tanks; Signature Flight Support, an FBO;[3] and the Logan Airport Greenway. The Greenway Connector and Narrow-Gauge Connector both run parallel to the MBTA Blue Line corridor in this section of the Airport.

  Massport is exploring options to improve the layout and efficiency of the NSA by optimizing the existing uses. These include enhancing Remain Over Night (RON) aircraft parking and repurposing the Green Bus Depot. Massport issued a Request for Information (RFI) solicitation for the replacement of the current Signature Flight Support FBO facility. These projects are expected to require environmental review. Massport is also constructing an additional jet fuel storage facility to enhance the reliability and distribution of the current system and associated infrastructure. The site is located on Prescott Street adjacent to the Economy Garage on the site of an abandoned Massport water pumping station. The functions, facilities, and land use in the Project area will remain generally consistent. Construction is underway and expected to be complete in 2024.

- **Southwest Service Area (SWSA)** is south of Logan Airport's main access roadway and is bounded by Harborside Drive to the east. Because of its proximity to the terminals and the regional highway system, the SWSA functions as Logan Airport's primary ground transportation hub. It includes the Rental Car Center (RCC) as well as taxi, RideApp, and bus and limousine pool lots. The RCC project reduced on-Airport VMT and improved roadway and intersection operations by consolidating the rental car and shuttle bus fleets, and some Massport shuttle buses, within a unified shuttle route system. This unified system provides several benefits, including the elimination of eight rental car shuttle bus fleets, equivalent to a net total of 66 buses. Other upgrades included intersection and roadway infrastructure improvements, including signal coordination and dedicated ramp connections; and the Ground Transportation Operations Center (GTOC), enabling efficient planning and operation of Airport-wide transit activities.

  Massport is studying the relocation of the functions of the green bus depot from NSA to the SWSA to support the transition to an electric fleet, as part of Massport's *Net Zero by 2031* plan. The depot building would be reused. As part of this effort, Massport will assess the existing ground transportation uses in the SWSA as well as future needs such as net zero requirements of other alternative-fueled ground transportation modes.

- **Bird Island Flats (BIF)** is located south of the SWSA. BIF has landside access via Harborside Drive and water access through the water taxi system which shuttles passengers to Logan Airport from downtown Boston, and the South Shore. BIF facilities include the Hyatt™ Hotel and Conference

3 A fixed-base operator (FBO) is a commercial entity granted the right by an airport authority (e.g., Massport) to operate at an airport and provide services such as fueling, aircraft maintenance, aircraft tie-down and parking, and hanger management.

Center; the Logan Office Center and adjoining garage; Lot B employee parking; the Logan Taxi Pool Lot; the Water Shuttle Dock; the Logan Airport Rescue and Fire Fighting (ARFF) Facility Marine Dock; and the Harborwalk, a publicly accessible promenade along the harbor's edge.

- **South Cargo Area (SCA)** is located southeast of the SWSA and is generally bounded by Harborside Drive to the south and by Logan Airport's airside area to the east and north. The SCA provides landside access and secured airside access for Logan Airport. It is the primary cargo area for domestic and international cargo operations.
- **Governors Island** is at Logan Airport's southern tip and is bounded by Runway 14-32 to the south, Boston Harbor on the East, Runway 4R to the west, and Runway 9 to the north. Governors Island has functioned as a storage site for the CAT/Ted Williams Tunnel dredged material and for Airport construction stockpiles. The area also contains an ARFF Facility training area, snow removal equipment parking, a biocell remediation area, and FAA aircraft navigation equipment. Massport is currently evaluating future uses in the area, including RON aircraft parking and cold storage.

In addition to the above area-specific projects and planning concepts, Massport is also currently studying the feasibility of a Joint Operations Center (JOC). The project would consolidate the State Police Dispatch Center; Maritime Monitoring, with future Hanscom Field and Worcester Regional Airport monitoring; and the Transportation Security Administration (TSA) facilities into a more centrally located JOC facility. The JOC would be a state-of-the-art operations and situational awareness center with the objective to realize the security and response benefits afforded through integrated incident dispatch and mobile response for public safety and security services.

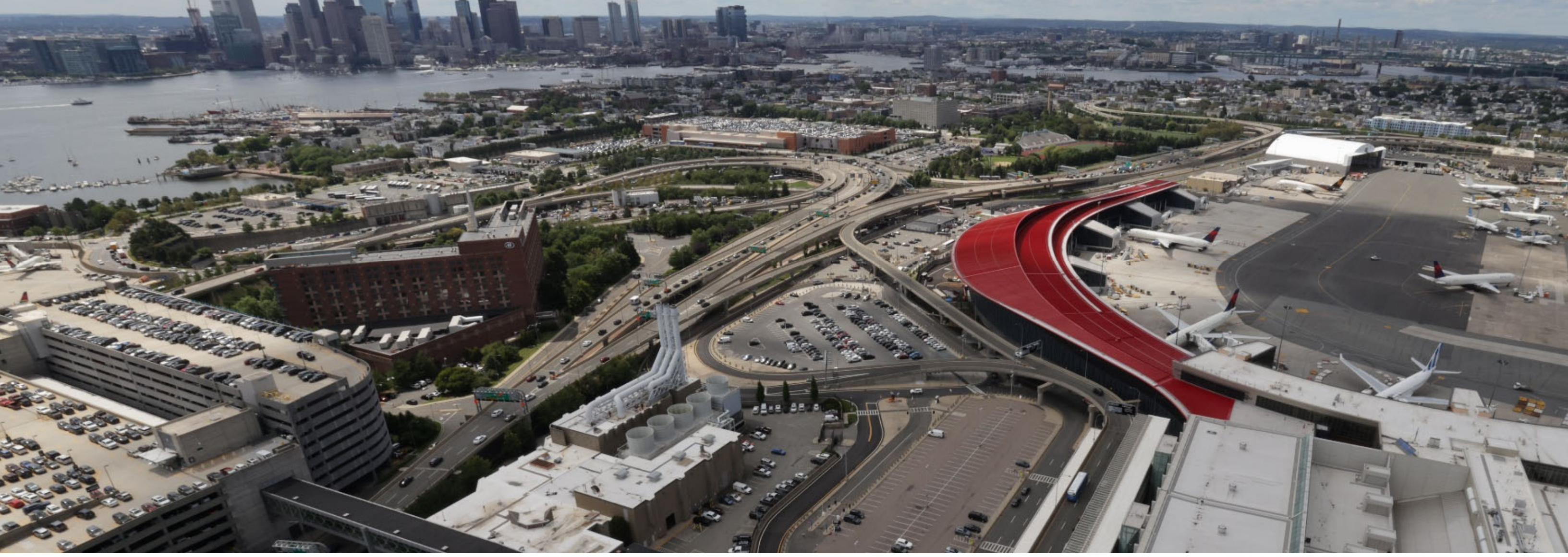
Table 4-5 Description and Status of Service Areas Projects and Planning Concepts, as of December 31, 2022

Description	Status
1. Logan Airport Equipment Storage and Maintenance Facility (ESMF) Relocation (NSA)	
Massport is evaluating optimizing the North Service Area, which include hangars, aircraft parking, the North Gate, aircraft fueling facilities, and antiquated maintenance support facilities.	• Massport is evaluating decommissioning old buildings and reorganizing and consolidating new and repurposed buildings. This includes enhancing the existing aircraft parking ramp. A feasibility study for is currently underway.
2. Jet Fuel Storage Addition – North Service Area (NSA)	
Massport is enhancing the existing jet fuel storage and distribution system by installing an additional jet fuel storage facility. The functions, facilities, and land use in the project area will remain generally consistent.	• Construction of a fifth jet fuel storage tank immediately adjacent to the existing tanks and fuel distribution facilities began in 2022. • Construction is expected to be complete in 2024.

Table 4-5 Description and Status of Service Areas Projects and Planning Concepts, as of December 31, 2022

Description	Status
3. Green Bus Depot Operations Repurposing – Southwest Service Area (SWSA)	
Massport is studying the relocation of its existing green bus depot operations from NSA to the SWSA to support the transition to electric fleet, as part of Massport's *Net Zero by 2031* plan.	• Massport is exploring alternatives for the Green Bus Depot's current operations and reuse of the existing building.
4. Governors Island Equipment Storage	
Governors Island is being considered as a future Remain Overnight (RON) aircraft parking location, and other uses, including cold storage.	• Massport continues to evaluate concepts for Governors Island.
5. Compressed Natural Gas (CNG) Station Relocation	
Massport is considering relocating the existing CNG Station from the NCA to the SWSA to accommodate increased NCA airside operations.	• Massport is currently moving forward with designing and building the CNG Station in the SWSA. Construction of the station is anticipated to be completed by the end of 2024. Once operational, the existing CNG station would be demolished.
6. Cargo Through-put Facility	
Massport is considering the construction a cargo through-put facility to improve cargo processing and reduce airside traffic, by facilitating transfer of goods from aircraft to transfer points for future distribution.	• The project is currently in the feasibility and planning stage.
7. Replacement NCA Cargo Facilities (location to be determined)	
Massport continues to consider replacement cargo facilities in the NCA to compensate for cargo facilities lost due to the Central Artery Tunnel Project and meet projected growth in cargo demand.	• This project is currently in the feasibility and planning stage.
8. Joint Operations Center	
A Joint Operations Center (JOC) would be a state-of-the-art operations and situational awareness center, combining four current Airport operations within one facility and would allow for additional operations as needed.	• Development of the JOC is in the feasibility phase.

Source: Massport.
Note: See Figure 4-5 for the location of service area projects and planning concepts.



5. Regional Transportation

Logan Airport is a key component of New England's intermodal transportation system that is served by a network of airports, roadways, and rail. This chapter looks at Logan Airport's role in regional transportation and describes the range of options for air travel for the region. Logan Airport is the largest of the three airports owned and operated by Massport and is the primary international and domestic gateway for New England. Massport also owns and operates Worcester Regional Airport (ORH) and Hanscom Field (BED); both of which play important roles in New England's regional transportation system.

This chapter updates 2022 activity at each of the other commercial passenger airports in New England, including passenger and flight activity, ongoing projects to upgrade those facilities, and their long-range plans. Over the past decade, rail connections between Boston, New York City, and Washington D.C. have continued to capture more passengers and in the case of New York City, more passengers now use rail than aircraft to travel between Boston and the New York metropolitan area. This chapter focuses on 2022 **passenger counts** and aircraft operations at New England regional airports[1] and compares them to 2021 and 2019 figures, including:

- Changes in passenger counts, aircraft operations, and other factors affecting regional airport activity during the pandemic;
- The status of current capital improvement plans and projects;
- Massport's initiatives and joint efforts with other transportation agencies to improve the efficiency of the regional transportation system; and
- Regional long-range transportation planning efforts.

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1 A review of passenger activity levels and aircraft operations at Logan Airport is provided in Chapter 3, *Activity Levels and Forecasting*.

Regional Transportation Key Findings

The following details key findings of regional transportation:

- Logan Airport is the largest airport in New England and is the primary international and domestic gateway for the region.[2] Worcester Regional Airport offers commercial service and provides facilities for **general aviation (GA)** and Hanscom Field is the region's premium GA facility. Other airports in the New England region include Bradley International Airport and Tweed-New Haven Airport (CT); T.F. Green International Airport (RI); Manchester-Boston Regional Airport and Portsmouth International Airport (NH); Portland International Jetport and Bangor International Airport (ME); and Burlington International Airport (VT).
- Excluding Logan Airport, the ten regional airports served approximately 15 million air passengers in 2022, approximately 14 percent below 2019 levels. The ten airports accounted for 622,461 aircraft operations, which was roughly 2 percent higher than 2021 and 2019 aircraft operations.
- The ten regional airports accommodated nearly 30 percent of the total air passengers in New England, while the remaining 70 percent were accommodated at Logan Airport.
- In 2022, ORH served 160,656 passengers, which was 17 percent below its 2019 **passenger count**, and welcomed its one-millionth passenger in 2022. jetBlue Airways, American Airlines, and Delta Air Lines resumed commercial service after a pause during the pandemic.
- Driven by GA demand, BED remained the second busiest airport in New England in 2022 after Logan Airport in terms of aircraft operations.
- New England regional airports continued to welcome new **low-cost carriers** and **ultra-low-cost carriers (ULCC)** in 2022, including Allegiant Air, Avelo Airlines, Breeze Airways, Frontier Airlines, Spirit Airlines, and Sun Country Airlines.
- In fiscal year (FY) 2022, Amtrak's Northeast Corridor (NEC) carried approximately 9.3 million rail passengers, almost doubling FY 2021 ridership, though 15 percent lower than the FY 2019 ridership.

5.1 New England Regional Airports

The New England region, which is anchored by Logan Airport, a primary hub, has a system of 10 secondary commercial service, **reliever**, and GA regional airports. **Figure 5-1** shows together, these 11 airports accommodated 51.3 million passengers in 2022, a 51.2 percent increase from 33.9 million passengers in 2021, though 14 percent below 2019's 59.7 million-passenger peak. Collectively, these airports represented more than 98 percent[3] of New England's air passenger demand.

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

3 Federal Aviation Administration. Final Calendar Year (CY) 2022 Passenger Boarding Data.

The remaining passenger activity demand is accommodated by smaller commercial service airports and GA airports across the region. For this *2022 ESPR*, passenger – not air cargo – traffic is the primary measure of aviation recovery since the pandemic.

New England Regional Airports consist of the following 11 airports:

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

Logan Airport serves a major domestic **origin and destination (O&D)** market.[4] Logan Airport is the primary international gateway for New England. The regional airports range in role and activity levels. BDL served over 5.7 million commercial passengers in 2022, while BED currently does not handle regularly scheduled commercial flights but serves as New England's largest GA facility. As commercial passenger air service rebounds and expands to meet regional passenger demand, the network of regional airports enhances airlines' ability to cater to New England's diverse local populations.

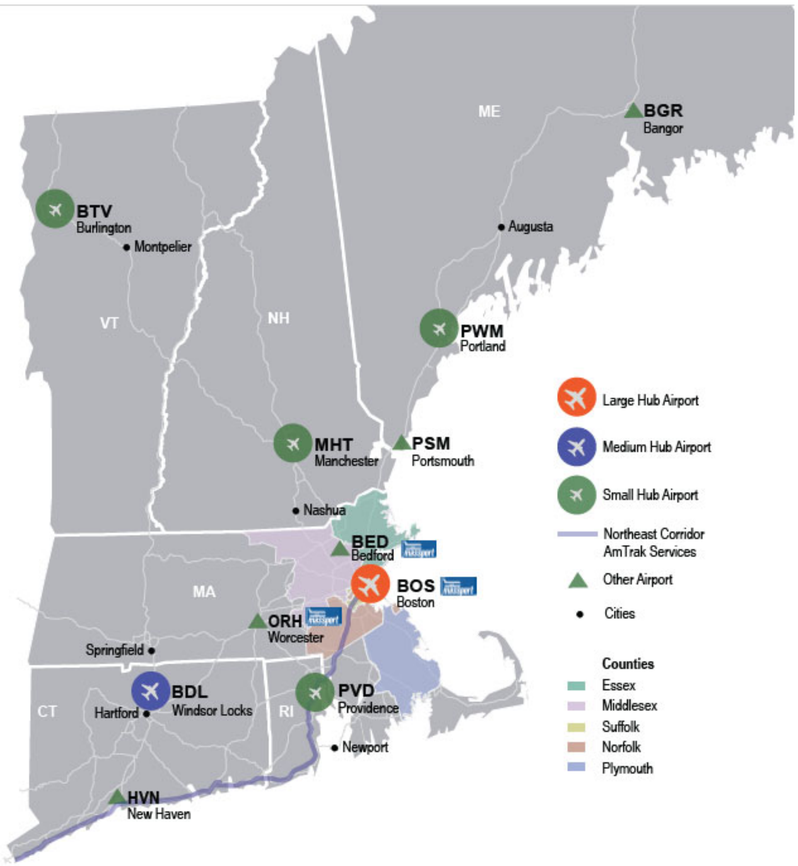
In addition to airports shown in **Figure 5-1**, tertiary airports in New England serve isolated communities where air operators offer **air taxi**, seasonal, or niche commercial air services. These airports, however, are primarily for GA purposes, and are listed below:

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

These tertiary airports support frequent commercial flights to Logan Airport and PVD, including popular Cape Cod and island service during the summer. Most of these tertiary airports are either geographically isolated, sufficiently distant from Logan Airport, or both. Therefore, these airports are unlikely to reduce passenger usage of Logan Airport; rather, many of these airports depend on Logan Airport for connecting services.

4 A strong O&D market like Boston generates significant local passenger demand, with many passengers starting their journey and ending their journey in that market.

Figure 5-1 New England Regional Transportation System – 2022 Commercial Service Airport Passenger Counts and Aircraft Operations



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

Source: Federal Aviation Administration (FAA). 2022 preliminary. *Passenger Boarding Data*. Massport and individual airport data reports. https://www.faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/.

Note: Airport sizes are based on the FAA definition, described in Key Terminology. BOS, ORH, and BED are Massport-owned.

5.2 Strong Regional Economy Contributes to Rebounding Growth at Logan Airport

New England demonstrated strong economic growth through early 2020. This growth was the primary driver of air travel growth at Logan Airport, demonstrating the close relationship between the regional economy and Logan Airport activity. The Massachusetts Department of Transportation (MassDOT) *2019 Statewide Airport Economic Impact Study* reported a 22 percent increase in economic output at Logan Airport from 2014 to 2019.[5] This reflected increased contributions from visitor spending, airline and GA passenger traffic, and new on-airport businesses. The robust regional economy drove Logan Airport's inbound and outbound passenger demand by fostering global and domestic trade and tourism. While the region's economy rebounded to pre-pandemic levels in 2022, Logan Airport's passenger counts are rebounding slower than those at other domestic **large hub** airports. Travel restrictions among Logan Airport's non-stop destinations and airline route development planning decisions have contributed to Logan Airport's slower return to pre-pandemic passenger counts as discussed in Chapter 3, *Activity Levels and Forecasting*.

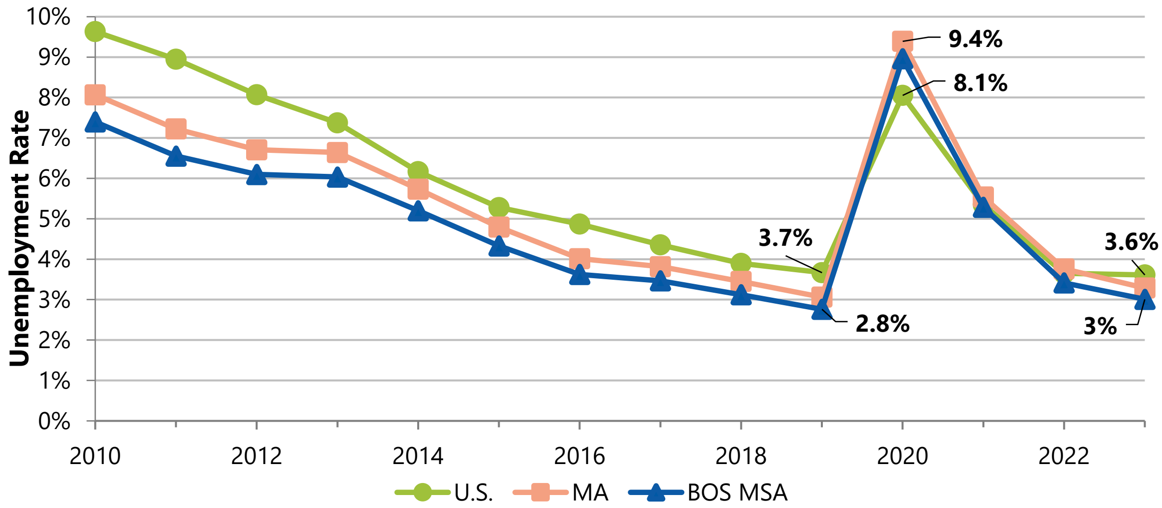
In 2022, the population of the six New England states was approximately 15.1 million, with Massachusetts accounting for approximately 46 percent. Logan Airport, the region's predominant international airport, caters to passengers from across New England, with a primary catchment area of five Massachusetts counties: Essex, Middlesex, Norfolk, Plymouth, and Suffolk, which includes the City of Boston. The catchment area currently has about 4.4 million people (see **Figure 5-1**) and has grown around 0.6 percent annually since 2010, increasing by approximately 400,000 people. Further information on population trends in the catchment area is in Appendix G, *Regional Transportation Supporting Documentation*.

5.2.1 Factors Influencing Massachusetts' Economy

In 2022, Massachusetts' economy maintained robust growth, supported by a strong labor market, low unemployment, and declining inflation. Although the national economy occasionally outpaced the State's quarterly economic growth, both economies grew in tandem. As of the time of this report, there are several indications of slower growth in 2024, corresponding with trends seen in 2023, which will be assessed in future Environmental Data Report (EDR) and ESPR reports.

5 Mass DOT. Massachusetts Statewide Airport Economic Impact Study Update. 2019. https://www.mass.gov/doc/aeronautics-economic-impact-study-2019/download.

Figure 5-2 **Unemployment Rate Comparison: U.S., Massachusetts, and Boston Metropolitan Statistical Area (MSA), 2010–2023 (Annual-basis, except 2023 year-to-date)**



Source: U.S. Bureau of Labor Statistics (BLS). 2023 (latest available month. is June 2023, preliminary; May 2023 for the BOS MSA).
Note: BOS MSA is represented as the Boston-Cambridge-Nashua, MA-NH Metropolitan New England City and Town Area, as defined by the U.S. BLS. Not seasonally adjusted.

In 2019, Greater Boston consistently maintained a lower unemployment rate compared to the State and the nation (see **Figure 5-2**). Massachusetts experienced peak unemployment in April 2020, which was greater than the national unemployment rate in the same month.[6] The State's unemployment rate fell steadily in 2021, and by June 2023, unemployment was at its lowest measure since 2000.[7]

Logan Airport not only serves a growing population but a high-earning one as well. Personal income per capita in 2022 within the Airport's catchment area was 11.6 percent higher than the State average and 46 percent higher than the national average.[8] Massachusetts' major employers are in technology, healthcare and social assistance, and educational services. The State's technology sector, especially the biotechnology industry in Boston, has experienced significant growth in recent years.[9] Massachusetts ranks third nationwide for education and healthcare, emphasizing its strengths in these areas.[10] Economic growth estimates underscore the contributions of innovation, business start-ups, educational services, and the healthcare and biotechnology industries. This advantage attracts higher venture capital

Boston leads the nation in technology jobs per capita as well as share of residents over the age of 25 with advanced degrees.

6 U.S. Bureau of Labor Statistics.
7 UMass Donahue Institute MassBenchmarks. Published July 2023.
8 Woods & Poole Economics, Inc. 2023. Complete Economic and Demographic Data Source. Measured in current U.S. dollars.
9 U.S. Census Bureau via DataUSA. 2019. Boston-Cambridge, Newton, MA-NH Metro Area Profile. www.datausa.io.
10 U.S. News & World Report 2023. Massachusetts.

investment per capita compared to other states. Jones Lange LaSalle's Innovation Geographies report[11] placed Boston at #4 for innovation, alongside top global markets like Tokyo and Silicon Valley. Massachusetts has the world's second-highest technology talent concentration, remains a global leader in life sciences, and is home to the most life sciences headquarters worldwide, with over 250 companies that have each secured $100+ million in funding.[12]

As the world continues to adapt to many societal and economic impacts of COVID-19, the aviation industry's future depends on factors beyond its control. These factors include the potential return and spread of COVID-19 or other infections leading to new quarantine requirements and travel restrictions, economic instability, and the varied impacts of global hostilities.

5.3 New England Regional Trends

In 2022, New England airports, including Logan Airport, generated slightly over one million aircraft takeoffs and landings, marking a 14 percent rise from 2021, but 3.4 percent fewer aircraft operations than in 2019. This section focuses on overall passenger and aircraft operation trends at Logan Airport and the ten regional airports. Industry-wide, airlines are operating larger aircraft fleets, which contributes to **upgauging**. This added **seat capacity** per flight reduces the number of aircraft operations flown per day, especially on leisure-oriented routes. Airline network optimization has also led to higher **load factors**. These factors reduce the total number of aircraft operations, so it is important to note that declining aircraft operations do not always indicate a weakening airport market.

> Higher load factors mean the average flight is fuller today than it would have been 20 years ago, which indicates higher efficiency in operations.

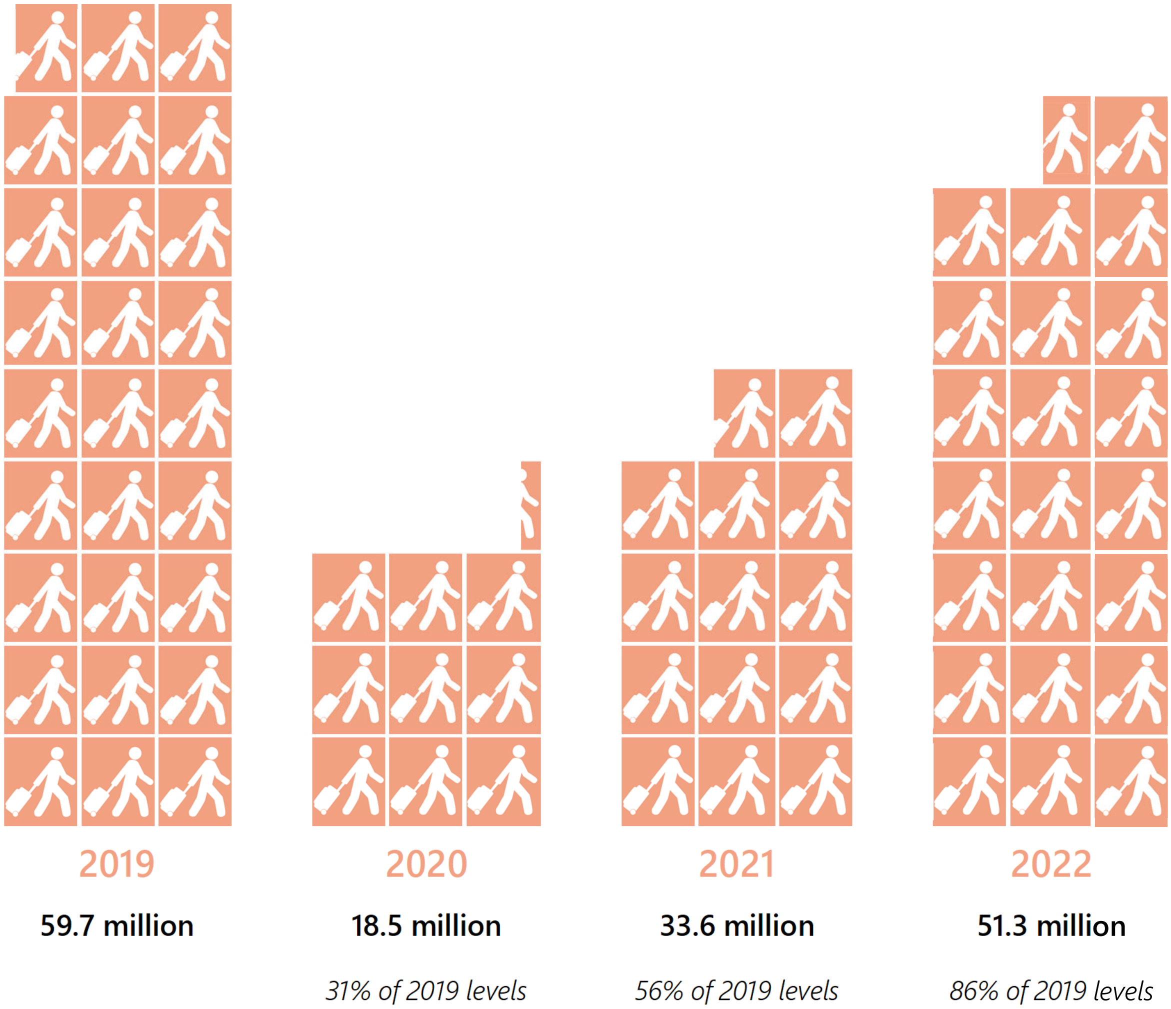
5.3.1 Regional Air Passenger Activity Trends

New England passenger counts rebounded significantly in 2021 and 2022 as travel resurged post-COVID-19 levels as shown in **Figure 5-3**. In 2021, regional airports saw higher annual passenger growth than in 2022 due to a limited reliance on international traffic and a sharper rebound from travel reductions in the early 2000s. The proportion of Logan Airport's total traffic influenced by international market segments is discussed in Chapter 3.

11 JLL's Innovation Geographies, "Innovation-oriented industries and talent concentration to drive urban and real estate recovery," January 25, 2022.

12 Boston Business Journal, "Resilience and recovery: What is driving Boston's economy forward?" March 21, 2022.

Figure 5-3 Passenger Activity at Logan Airport and New England Regional Airports in 2019-2022



Notes:

 equal two million passengers

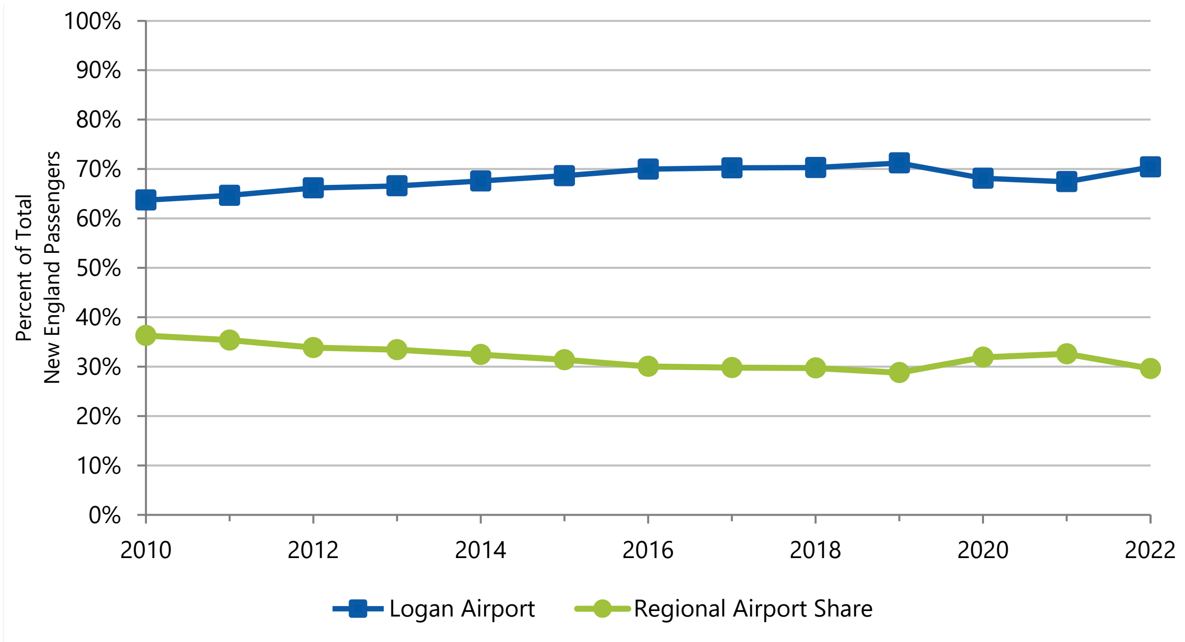
Table 5-1 summarizes passenger activity across each of the regional airports. 2022 passenger recovery towards pre-pandemic figures varied across New England's airports. Region-wide passenger activity was down 12 percent from 2019, but up 35 percent from 2021. Logan Airport remained the region's dominant gateway, handling 70 percent of all New England air passengers. In 2022, Logan handled more than twice as many passengers as the 10 other regional airports combined (see **Figure 5-4**).

Key performance metrics in 2022 for regional airports are listed below:

- New England's 10 regional airports, excluding Logan Airport, accounted for 15.2 million passengers in 2022, or 35 percent annual growth, compared to 17.2 million passengers in 2018 and 2019. These airports represented almost 30 percent of all New England passengers in 2022, compared to 28.8 percent in 2019 (see **Figure 5-4**).
- In 2022, Logan Airport passenger counts increased **year-over-year (YoY)** to 36.1 million passengers.
- Overall, New England airports' passenger counts grew by 51 percent in 2022.

Logan Airport's traffic growth has benefited from increased service by ULCC, plus increased presence from Delta Air Lines' and jetBlue Airways' hub operations. ULCCs such as Allegiant Air, Avelo Airlines, Breeze Airways, Spirit Airlines, and Sun Country Airlines have commenced operations at several New England secondary airports to capture pandemic-induced leisure demand, providing new non-stop connections for the region. Between 2010 and 2019, passenger traffic at New England's secondary airports grew 1.1 percent annually, slower than Logan Airport, where passenger traffic grew 5.0 percent annually. Facing service cuts, regional airport passenger share decreased from 2014 to 2019 while Logan Airport's route network, including new ULCC and low-cost carriers (LCC) services, expanded. These regional secondary commercial airports are returning to pre-pandemic passenger counts, bolstered by new ULCC service to popular leisure markets since the pandemic's onset.

Figure 5-4 Share of New England Passengers, 2010-2022



Source: Massport and individual airport data reports.

In 2022, PVD, MHT, and ORH collectively served 11.4 percent of total passengers using Greater Boston Area airports (BOS, PVD, MHT, ORH) as compared to 12.2 in 2019.

Figure 5-5 illustrates the historical air passenger distribution among BOS, PVD, MHT, and ORH; the latter recommencing scheduled commercial service in 2013.

Table 5-1 Passenger Activity at New England Regional Airports and Logan Airport (2010, 2019, 2021, 2022)

Airport	Passenger Levels (millions)[1]					Percent change from 2019 to 2022
	2000	2010	2019[2]	2021[2]	2022[2]	
Bradley International (BDL), CT	7.34	5.34	6.75	4.62	5.80	-14.2%
Rhode Island T.F. Green International (PVD), RI	5.43	3.94	3.99	2.33	3.17	-20.5%
Portland International Jetport (PWM), NH	1.34	1.71	2.18	1.71	1.99	-8.9%
Manchester-Boston Regional (MHT), NH	3.17	2.81	1.70	0.96	1.29	-23.8%
Burlington International (BTV), VT	0.90	1.30	1.41	0.78	1.20	-14.5%
Tweed-New Haven Regional (HVN), CT	0.08	0.07	0.10	0.06	0.70	+631.4%
Bangor International (BGR), ME	0.38	0.39	0.61	0.57	0.68	+11.1%
Portsmouth International (PSM), NH	0.07	0.00	0.23	0.15	0.16	-30.8%
Worcester Regional (ORH), MA	0.11	0.07	0.19	0.03	0.16	-17.4%
Hanscom Field (BED), MA3 4	0.16	0.00	0.02	0.02	0.02	+36.5%
Regional Subtotal	**18.98**	**15.63**	**17.17**	**11.22**	**15.17**	**-11.7%**
Logan Airport	27.73	27.43	42.52	22.68	36.09	-15.1%
Total	**46.71**	**43.06**	**59.70**	**33.90**	**51.26**	**-14.1%**

Source: Massport and individual airport data reports. Non-Massport airports may be based on U.S. Department of Transportation (U.S. DOT), T-100 Database for scheduled and non-scheduled services, if direct airport records are unavailable.

Notes: Data for Logan Airport includes domestic, international, and GA passengers.

Numbers in parentheses ( ) indicate negative numbers. All calculations may not properly sum due to rounding.

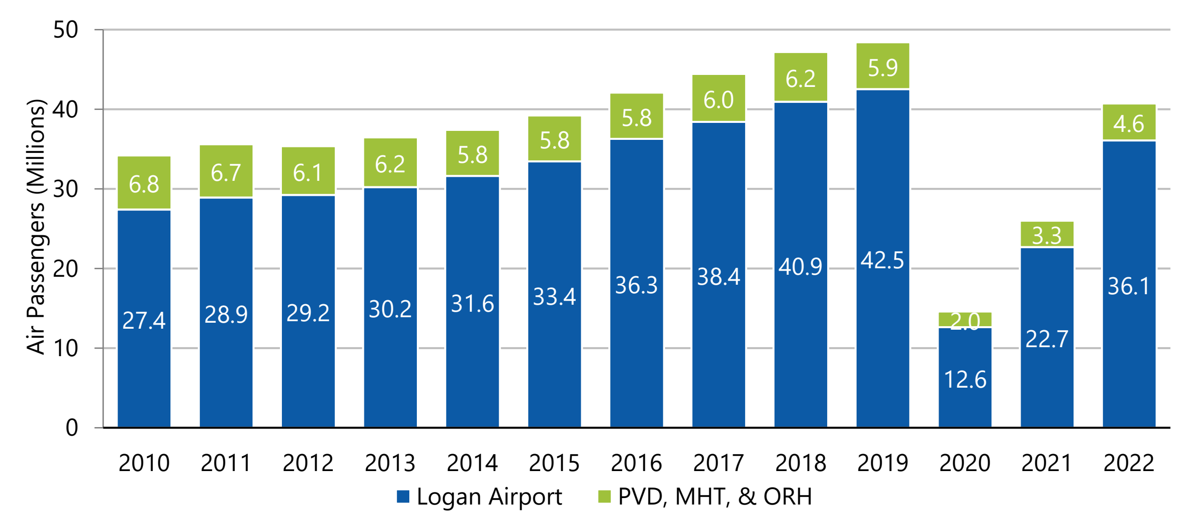
1 Passenger levels are in millions and rounded to the hundredth place; percent change was calculated with unrounded, raw data. Passenger levels are enplaned plus deplaned passengers (where available from airport records) or Federal Aviation Administration (FAA) enplaned passengers times two.

2 Reflects most updated passenger statistics for BTV, MHT, PWM, and PSM based on latest available airport records as of August 2023.

3 If the figure is 0.00, it indicates fewer than 5,000, but more than zero scheduled commercial passengers.

4 BED also reported annual non-scheduled passengers above 9,000 between 2011 and 2022 via U.S. DOT T-100.

Figure 5-5 **Passenger Activity Levels at Logan Airport (BOS), Rhode Island T.F. Green International Airport (PVD), Manchester-Boston Regional (MHT), and Worcester Regional (ORH) Airports, 2010-2022**



Source: Massport and individual airport data reports.

5.3.2 Aircraft Operations Trends

Total aircraft takeoffs and landings in New England since the start of the COVID-19 pandemic have remained well below the region's historical high previously seen in 2000 with 1.6 million aircraft operations. This reduction is primarily the result of airline upgauging and route network optimization. In 2022, total regional aircraft operations were just above 1 million, or 96 percent of pre-pandemic aircraft operations. In 2022, commercial aircraft operations in New England had a 31.5 percent YoY increase, while GA and military aircraft operations declined 2.3 percent and 12.0 percent, respectively. Airlines maintained their aircraft upgauging trend while also maintaining high passenger load factors. Concurrently, secondary regional airports are encountering shifts in airline service commitments due to airlines adapting their network strategies to address challenges related to labor availability and operating costs. 2022 key airport operations trends are listed below:

- As shown in **Table 5-2**, total 2022 aircraft operations in New England, including Logan Airport, were slightly higher than in 2019.
- In 2022, annual aircraft operations at Logan Airport increased 42.3 percent from 2021 but remained 11.4 percent below 2019 levels.
- Annual aircraft operations in 2022 at the other 10 regional airports increased by 2.1 percent but remained below 2019 levels. GA and military aircraft operations at the regional airports were above 2019 levels.

- Despite expanding commercial airline service, regional airports like BDL, PSM, PVD, and HVN reported declining or stagnant aircraft operations due to post-pandemic recessions in local GA and business aviation activity.
- During the COVID-19 pandemic, businesses turned to non-commercial aircraft for safety and convenience, while remote work allowed people to move away from major cities, boosting demand for New England's GA airports. Commercial operations also improved as airlines resumed suspended routes or introduced new ones in high-demand leisure markets.

GA operations continue to dominate the regional airports. GA represented 6.7 and 9.0 percent of aircraft operations at Logan Airport in 2020 and 2021, respectively. This is typical for a large hub airport like Logan Airport. In 2022, New England airports handled 10.2 percent more total GA operations than in 2019. Fuel costs account for a sizable portion of an aircraft's operating costs. Crude oil prices increased from 2019-2022, affecting aviation AvGas and Jet-A fuel prices and could account for the slight decrease in GA activity from 2021.

At regional airports, aircraft operations outweigh passenger numbers due to fewer seats on GA aircraft. In 2022, regional airports accounted for 29.5 percent of New England's passengers, but 62.2 percent of aircraft operations. On average, there were approximately 24 passengers per aircraft operation at the regional airports in 2022, about 13 percent lower than the 2019 average of 28 passengers per aircraft operation. Logan Airport had approximately 95 passengers per aircraft operation in 2022, down from 100 passengers per aircraft operation in 2019.

Table 5-2 Aircraft Operations by Classification for New England's Airports (2019 and 2022)

Airport	2019				2022				Percent Change of Activity Levels			
	Commercial[1]	GA[2]	Military[2]	Total	Commercial[1]	GA[2]	Military[2]	Total	Commercial[1]	GA[2]	Military[2]	Total
Bradley International (BDL)	76,352	12,652	2,379	91,383	63,301	12,887	3,197	79,385	-17.1%	+1.9%	+34.4%	-13.1%
Rhode Island T.F. Green International (PVD)	46,393	23,017	351	69,761	42,296	23,786	746	66,828	-8.8%	+3.3%	+112.5%	-4.2%
Portland International (PWM)	35,855	21,731	646	58,232	30,706	21,298	1,013	53,017	-14.4%	-2.0%	+56.8%	-9.0%
Manchester-Boston Regional (MHT)	34,965	15,762	412	51,139	26,791	18,953	664	46,408	-13.4%	+20.2%	+61.2%	-9.3%
Burlington International (BTV)	28,413	40,894	3,963	73,270	24,050	72,409	5,108	101,567	-15.4%	+77.1%	+28.9%	+38.6%
Bangor International (BGR)	17,678	17,117	10,805	45,600	17,657	14,571	9,962	42,190	-0.1%	-14.9%	-7.8%	-7.5%
Portsmouth International (PSM)	9,346	28,742	3,457	41,545	11,174	44,247	6,298	61,719	+19.6%	+53.9%	+82.2%	+48.6%
Tweed-New Haven Regional (HVN)	6,094	21,853	483	28,430	8,548	17,489	335	26,372	+40.3%	-20.0%	-31.6%	-7.2%
Worcester Regional (ORH)	5,554	17,186	745	23,485	4,087	15,783	1,038	20,908	-26.4%	-8.2%	+39.3%	-11.0%
Hanscom Field (BED)[3]	426	127,670	575	128,671	554	119,961	1,701	122,216	+30.0%	-6.0%	+195.8%	-5.0%
Subtotal	**261,076**	**326,624**	**23,816**	**611,516**	**231,015**	**361,384**	**30,062**	**622,461**	**-11.5%**	**+10.6%**	**+26.2%**	**+1.8%**
Logan Airport	398,254	28,922	0	427,176	348,109	30,504	0	378,613	-12.6%	+5.5%	-	-11.4%
Total	**659,330**	**355,546**	**23,816**	**1,038,692**	**579,124**	**391,888**	**30,062**	**1,001,074**	**-12.2%**	**+10.2%**	**+26.2%**	**-3.6%**

Sources: Federal Aviation Administration (FAA) tower counts; Massport and individual airport data reports.

Notes: Ranked by 2022 commercial operations. FAA tower counts used for all airports except Logan Airport and PSM.

1 May include some Air Taxi operations by fractional jet operators. FAA tower counts may combine fractional jet operations with small regional/commuter airline operations.

2 Includes itinerant and local operations at the regional airports. Military operations at Logan Airport are negligible or non-existent and are not included in Massport counts.

3 Commercial value represents non-scheduled commercial activity.

5.3.3 Regional Airline Passenger Service in 2022

The aviation industry received COVID-19-related federal assistance, including through the Coronavirus Aid, Relief, and Economic Security (CARES) Act, in 2020 and 2021 to maintain and support air carriers' scheduled services, payroll, and employment efforts for airline staff and contractors. This funding helped the aviation sector continue its rebound throughout 2022. This progress occurred while airlines adjusted to rising inflation, supply chain challenges, shifts in business travel trends, and geopolitical disruptions. Airlines underwent several changes to adapt and achieve profitability in 2022. Business travel has changed in the post-COVID environment and concerns about a recession have altered passenger mixes. Airline networks have also adjusted to achieve more efficient operations, respond to labor shortages and rising fuel costs, and accommodate resurging leisure travel demand.

Airlines adjust service by adding flight frequencies, reducing flight frequencies, adjusting aircraft size, or a combination of the three. These modifications impact the number of seats available to passengers, referred to as seat capacity. Hence, when discussing airline services, both seat capacity and the number of departures are taken into consideration. This section summarizes airline departures, seat capacity variations, and many of the new and discontinued routes at regional airports during 2022. When relevant, information based on published 2023 advanced schedules is provided.

5.3.3.1 Service Developments at the Regional Airports

In 2022, 15 scheduled commercial carriers operated from the ten regional airports in New England, down from 16 in 2021. Air Canada was the only foreign carrier that restarted operations from the regional airports, while Boutique Air ceased service. Besides PWM and BED, none of the other New England regional airports experienced a decrease in total commercial operations in 2022.

In the 2010s, airlines largely recovered from the steep service cuts seen during the 2008-2009 economic recession. Since then, airlines optimized their networks by reducing unprofitable routes and by utilizing higher-capacity aircraft. This growth was largely eliminated during the peak of the COVID-19 pandemic. Although seven out of the ten New England regional airports reported below-2019 traffic levels in 2022, each of them experienced an increase in scheduled seat capacity compared to 2021. Notably, ORH and BGR exceeded 2019 passenger levels. Available seats at HVN greatly increased due to new airline service, placing HVN's seat capacity near BGR levels. In 2022, ORH exceeded 2019 capacity by 19.5 percent, representing a fivefold passenger increase over 2021, indicating strong post-pandemic recovery.

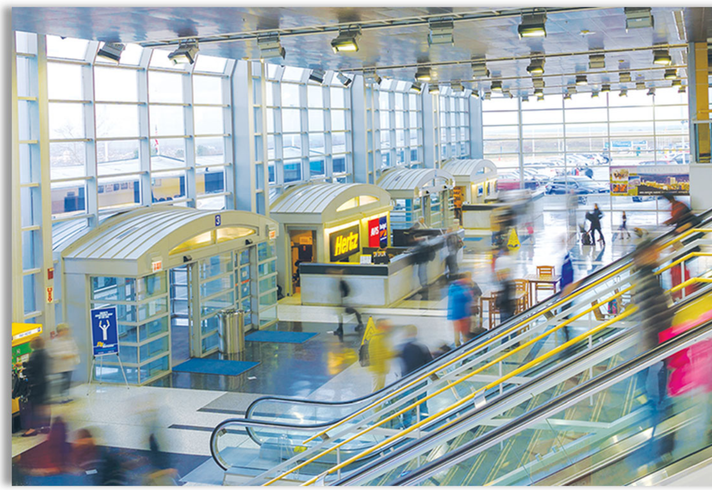
5.4 Worcester Regional Airport (ORH)

ORH, situated in Worcester and Leicester, Massachusetts, is approximately 50 miles west of Logan Airport. It offers corporate GA operations and commercial airline service. In 2000, Massport assumed management of ORH and acquired the facility from the City of Worcester in June 2010. In conjunction with the City of Worcester and community stakeholders, Massport promoted the reintroduction of scheduled airline service at ORH and secured new service from jetBlue Airways. In November 2013, jetBlue Airways commenced non-stop services to Orlando International and Fort Lauderdale-Hollywood airports using 100-seat Embraer 190 aircraft. Five years later, American Airlines and Delta Air Lines initiated flights. Key airport updates for 2022 are summarized in **Table 5-3**. Additional information is in Appendix G, Section G.3.

Table 5-3 Worcester Regional Airport (ORH) 2022 Highlights

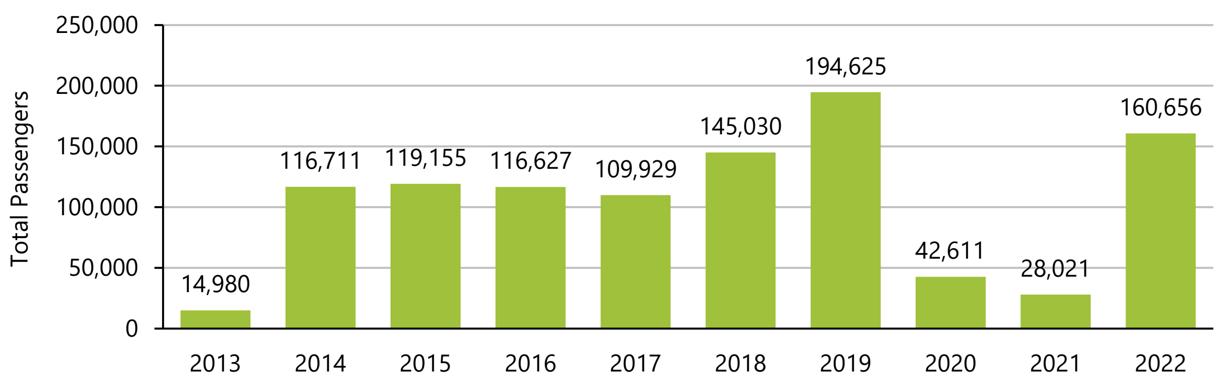
- In 2022, the Airport served 160,000 passengers, which was 17.4 percent below 2019 levels.
- Operations in 2022 totaled 20,908 which was 11.0 percent below 2019 levels.
- Between 2013 and 2022, ORH served 1.04 million commercial passengers as illustrated in Figure 5-6.
- GA activity declined 6 percent in 2022 from 2021.
- Airline seat capacity is 20 percent higher than in 2019 (Source: Official Airline Guide [OAG]).

Reference Table 5-1 for historical passenger activity.
See Table 5-2 for historical aircraft operations.



Worcester Regional Airport Lobby
Photo Credit – Massport

Figure 5-6 Passenger Activity at Worcester Regional Airport (ORH), 2013–2022



Source: Massport.
Note: 2021 passenger activity was revised compared to the *2020/2021 EDR* report.

5.5 Hanscom Field (BED)

Situated in Bedford, Concord, Lincoln, and Lexington, Massachusetts, around 20 miles northwest of Logan Airport, BED is the foremost general aviation facility for business and corporate aviation in New England. It functions as a reliever for Logan Airport by accommodating a range of GA activities, including corporate aviation, private flights, pilot training, commuter air services, air charters, and light cargo operations. More than 98 percent of the air traffic at BED is civilian. BED also serves as a joint commercial-military facility, hosting the Hanscom Air Force Base and the 66th Air Base Group. During the COVID-19 pandemic, GA flying increased dramatically due to travelers wanting to avoid crowded conditions on commercial flights. Eventually, commercial and charter air traffic recovered, and the pandemic-related demand for GA services receded. This is highlighted in BED's 2022 aircraft operations decline from pre-pandemic-era activity. Key updates for 2022 are summarized in **Table 5-4**. ESPRs are periodically prepared for BED and can be found on Massport's website.[13] Additional information is included in Appendix G, Section G.4.

Hanscom Field
Photo Credit – Massport

Table 5-4 Hanscom Field (BED) 2022 Key Highlights

- In 2022, there were 22,000 air taxi passengers which was a 36.5 percent increase from 2019.
- Operations in 2022 were 122,216; this was 1.2 percent lower than 2021 and 5 percent lower than 2019.
- BED managed four times more GA operations than Logan Airport and 1.6 times more than BTV, the second busiest GA airport in the region.

See **Table 5-1** for historical passenger activity.
See **Table 5-2** for historical aircraft operations.

13 Massport. Project Environmental Filings – Hanscom Field. 2023. https://www.massport.com/environment/project-environmental-filings/hanscom-field.

5.6 Bradley International Airport (BDL)

Situated in Windsor Locks, Connecticut, around 90 miles southwest of Logan Airport, BDL is a commercial airport and a dual-use military facility. The quasi-public Connecticut Airport Authority (CAA) supervises the operation and development of BDL. As a quasi-public agency, the CAA consists of an 11-member board and assumes responsibility for the day-to-day management of BDL. Additionally, the CAA oversees the operations at five GA airports in Connecticut: Danielson, Groton/New London, Hartford Brainard, Waterbury-Oxford, and Windham airports. The primary objective of the CAA is to foster the transformation of BDL and the five GA airports into significant economic contributors for the state. Key airport updates for 2022 are summarized in **Table 5-5**. Additional information including further breakdowns of passenger activity and operations, service developments, and facility improvements are included in Appendix G, Section G.5.

Table 5-5 Bradley International Airport (BDL) 2022 Key Highlights

- In 2022, 5.8 million passengers were recorded, which was 14.2 percent lower than the 2019 levels.
- The total operations in 2022 were 79.,400 which was 13.1 percent below the 2019 levels.
- BDL experienced consistent passenger growth from 2012 to 2019 and notably surpassed a count of 6 million passengers in 2016.

See **Table 5-1** for historical passenger activity.
See **Table 5-2** for historical aircraft operations.

Bradley International Airport Lobby
Photo Credit – Connecticut Airport Authority

5.7 Rhode Island T.F. Green International Airport (PVD)

Situated in Warwick, PVD is the first airport in the U.S. to be owned and operated by a state entity – the Rhode Island Airport Corporation (RIAC). In May 2021, RIAC modified the airport's name by incorporating "Rhode Island" and "International" to enhance its alignment with the state's economy and tourism industry, further supporting Rhode Island's economic growth and appeal to tourists. PVD is just 60 miles southwest of Logan Airport, offering travelers in Boston's southern suburbs an airport alternative. Key airport updates for 2022 are summarized in **Table 5-6**. Additional information is included in Appendix G, Section G.6.

T.F. Green Airport, Rhode Island
Photo Credit – Airport Technology

Table 5-6 Rhode Island T.F. Green International Airport (PVD) 2022 Key Highlights

- In 2022, the passenger count was 3.2 million, which was 20.5 percent below the levels in 2019. The peak of PVD passenger count occurred in 2018, with a total of 4.3 million passengers.
- The operations in 2022 totaled 66,800 which was 4.2 percent lower than 2019 levels.
- In 2022, PVD managed approximately 23,000 GA aircraft operations, exceeding both the operation levels of 2021 and 2019.
- The recovery of commercial aviation continued to lag, driven by its three largest commercial carriers – American Airlines, Southwest, and Delta, which operated around 17 percent below pre-pandemic levels.

See Table 5-1 for historical passenger activity.
See Table 5-2 for historical aircraft operations.

5.8 Manchester-Boston Regional Airport (MHT)

MHT, located in Manchester, New Hampshire, is fewer than 50 miles north of Boston, Massachusetts. The City of Manchester owns the airport, and management is overseen by a five-member board. Key airport updates for 2022 are summarized in **Table 5-7**. Additional information is included in Appendix G, Section G.7.

Table 5-7 Manchester-Boston Regional Airport (MHT) 2022 Key Highlights

- In 2022, there were 1.3 million passengers, approximately 23.8 percent below the 2019 level of 1.7 million passengers. In 2018, MHT served 1.8 million passengers.
- Total operations in 2022 were 46,400, a 9.3 percent decrease from 2019 levels.
- MHT's seat capacity in 2022 was 26.9 percent lower than the 2019 level (Source: Official Airline Guide [OAG]).
- Total aircraft operations were 9.0 percent below the 2019 levels; however, strong GA activity (18.9 thousand GA movements) exceeded the 2019 levels by 20 percent.
- Commercial operations at MHT were 11 percent higher in 2022 than during the lowest point of the COVID pandemic in 2020, marking the slowest recovery among all New England airports.

See **Table 5-1** for historical passenger activity.
See **Table 5-2** for historical aircraft operations.

Manchester-Boston Regional Airport
Photo Credit – Airport Technology

5.9 Portland International Jetport (PWM)

PWM, situated in Portland, Maine, is under the ownership of the City of Portland. Prior to the onset of the COVID-19 pandemic, the airport experienced consistent growth in both passenger activity and operations from 2014 to 2019. In 2022, passenger traffic nearly returned to 2019 levels. This growth was supported by increased seat capacity offered by major airlines such as jetBlue Airways, United Airlines, Southwest Airlines, and Delta Air Lines. Key airport updates for 2022 are summarized in **Table 5-8**. Additional information is included in Appendix G, Section G.8.

Portland Jetport
Photo Credit – City of Portland

Table 5-8 Portland International Jetport (PWM) 2022 Key Highlights

- In 2022, there were 1.99 million passengers, which is 8.9 percent below the levels recorded in 2019.
- Operations in 2022 were 53,000 a decrease of 9.0 percent compared to the 2019 levels.
- The distribution of commercial and GA operations in 2022 remained consistent with the 2019 shares, accounting for approximately 60 percent and 40 percent of total aircraft operations, respectively.
- With just under two million passengers served in 2022, PWM ranked as the third busiest New England regional airport, following BDL and PVD.

See Table 5-1 for historical passenger activity.
See Table 5-2 for historical aircraft operations.

5.10 Burlington International Airport (BTV)

Patrick Lahey Airport, situated in Burlington, Vermont, is under the ownership of the City of Burlington and operates as a joint-use civil-military airport. From 2017 to 2019, the airport saw an overall growth in passenger traffic, operations, and available seat capacity. In 2022 the airport reached 85.5 percent of 2019 passenger levels. Key airport updates for 2022 are summarized in **Table 5-9**. Additional information is included in Appendix G, Section G.9.

Table 5-9 Burlington International Airport (BTV) 2022 Key Highlights

- In 2022, there were 1.2 million passengers which was a decrease of 14.5 percent from 2019 levels.
- Operations in 2022 were significantly higher than in 2019, with 101,600 recorded operations, a 38.6 percent increase.
- There was a surge in GA activity at BTV, particularly in private jet and aircraft manufacturer test flights, which totaled 72,400 aircraft operations. This represents a 77 percent increase over 2019 GA volumes.
- Commercial activity at BTV saw a growth of 4,500 aircraft operations or 23 percent from 2021. However, it remained 15 percent below 2019 levels.
- For the first time since 2019, BTV served more than one million passengers.

See **Table 5-1** for historical passenger activity.
See **Table 5-2** for historical aircraft operations.

Burlington International Airport
Photo Credit – City of Burlington

5.11 Bangor International Airport (BGR)

BGR is in Bangor, Maine and owned by the City of Bangor. BGR is close to several of Maine's outstanding outdoor recreation areas, including Acadia National Park, Baxter State Park, Mount Katahdin, and Sugarloaf Ski Resort. Key airport updates for 2022 are summarized in **Table 5-10**. Additional information is included in Appendix G, Section G.10.

Bangor International Airport
Photo Credit – Flybangor.com

Table 5-10 Bangor International Airport (BGR) 2022 Key Highlights

- In 2022, the passenger count was 675,200, marking an increase of 11.1 percent from the 2019 levels.
- 2022 operations totaled 42,100 which was a decrease of 7.5 percent compared to the 2019 levels.
- BGR is one of the two commercial service airports in New England that managed to surpass the passenger counts of 2019.

See **Table 5-1** for historical passenger activity.
See **Table 5-2** for historical aircraft operations.

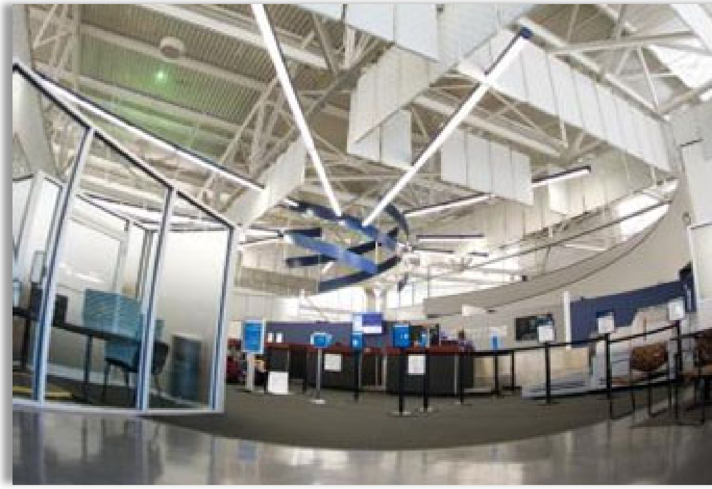
5.12 Tweed-New Haven Regional Airport (HVN)

HVN, situated in New Haven, Connecticut, operates under the management of the Tweed-New Haven Airport Authority, consisting of a six-member board. In 2022, HVN's passenger count surged past 700,000, and it plans to maintain an average of nine daily departures throughout 2023. This growth stems from ULCC Avelo Airlines choosing HVN as its inaugural East Coast base. Additionally, HVN's expansion initiatives, unveiled in 2021, will support Avelo's network expansion efforts. Key airport updates for 2022 are summarized in **Table 5-11**. Additional information is included in Appendix G, Section G.11.

Table 5-11 Tweed-New Haven Airport (HVN) 2022 Key Airport Highlights

- In 2022, the passenger count increased to 701,700, an impressive 631.4 percent increase from 2019 levels.
- Operations in 2022 decreased to 26,400, which is 7.3 percent below the 2019 levels.
- In 2021, Avelo Airlines set up an East Coast base at HVN, which had a profound impact on the airport's operations and the local economy. By 2023, Avelo plans to serve 18 non-stop destinations from HVN.
- Avelo Airlines served 700,000 passengers in 2022 alone, which is over seven times HVN's 2019 passenger volume.
- GA and military aircraft operations continued to be lower than the 2019 levels by 20 percent and 31 percent, respectively.
- Plans for terminal expansion and a runway extension are currently under review.

See **Table 5-1** for historical passenger activity.
See **Table 5-2** for historical aircraft operations.



Tweed-New Haven Regional Airport
Photo Credit – CTourism

5.13 Portsmouth International Airport (PSM)

PSM, situated in Portsmouth, New Hampshire, is managed by the Pease Development Authority. Over the past 15 years, the airport has undergone $85 million in airfield infrastructure improvements. Additionally, a newly reconstructed 5.3-acre terminal apron has been completed, enhancing the airport's facilities and operational capabilities. Key airport updates for 2022 are summarized in **Table 5-12**. Additional information is included in Appendix G, Section G.12.

Portsmouth International Airport at Pease
Photo Credit – Seacoastonline

Table 5-12 Portsmouth International Airport (PSM) 2022 Key Highlights

- There were 161,300 passengers in 2022, representing a 30.8 percent decrease below 2019 levels.
- 2022 operations were robust with 61,700 which was a 48.5 percent increase from 2019 levels.
- The continued growth in GA operations and demand for corporate travel further pushed PSM's aircraft operations even higher, resulting in an almost 50 percent increase as compared to 2019.

See Table 5-1 for historical passenger activity.
See Table 5-2 for historical aircraft operations.

5.14 Metropolitan and Regional Long-Range Transportation Planning

This section highlights efforts to promote an integrated, multimodal regional transportation network through cooperative transportation planning among agencies and stakeholders.

A balanced regional intermodal transportation network reduces reliance on Logan Airport as the region's primary transportation hub and provides New England travelers with a greater range of viable transportation options.

Massport plays a fundamental role within the transportation systems of the Boston metropolitan area and New England. Additionally, Massport supports an integrated multimodal transportation policy to improve the efficient use of transportation infrastructure on both a metropolitan and a regional scale. Logan Airport functions as New England's premier commercial airport, providing an essential connection between the New England states and the World.[14]

Massport participates in regional transportation planning efforts, which are included in **Table 5-13** below. Additionally, recognizing that Logan Airport is a substantial trip generator and key transportation resource in the Greater Boston metropolitan area, Massport participates in several interagency transportation planning forums that strive to enhance a variety of travel modes. Highlighting the value of interagency collaboration, the MassDOT Secretary of Transportation is an ex-officio member of the Massport Board of Directors. The table describes long-term statewide transportation initiatives that are part of the Boston and statewide transportation vision. Where applicable, Massport's commitment to and involvement in the regional transportation system is highlighted. At a local level, Massport engages with municipalities, particularly the City of Boston, to coordinate on transportation planning and land use issues. Recent plans, released by the City of Boston and discussed below, provide a relevant policy framework.

14 Federal Aviation Administration. 2007. Capacity Needs in the National Airspace System 2007-2025 (commonly referred to as FACT-2). https://www.faa.gov/sites/faa.gov/files/airports/resources/publications/reports/fact_2.pdf. Transportation Research Board. 2010. Airport Cooperative Research Program (ACRP) Report 31: Innovative Approaches to Addressing Aviation Capacity Issues in Coastal Mega-regions. https://nap.nationalacademies.org/read/14363/chapter/1.

5.14.1 Rail

High-speed rail is increasingly viewed as a complement to the regional transportation system and aviation planning.[15] Given the comparable travel times, proximity of service to downtown Boston, and the potential for highly efficient electrified propulsion, high-speed rail could provide intercity connectivity for city pairs in a corridor up to 600 miles long that would be competitive with air travel.[16] Boston's South Station is undergoing planning and design for expansion that would support rail mobility in Massachusetts and along the NEC, including future high-speed rail. **Table 5-14** reports on recent developments and current rail service originating in Boston, the status of air-rail linkages in the NEC, and the expanding Pilgrim Partnership, which provides commuter rail between Massachusetts and Rhode Island.

15 Transportation Research Board. 2015. ACRP 03-23: Integrating Aviation and Passenger Rail Planning. https://crp.trb.org/acrpwebresource2/wp-content/themes/acrp-child/documents/065/original/ACRP_118_Integrating_Aviation_and_Passenger_Rail_Planning.pdf.

16 America 2050. 2009. Where High-Speed Rail Works Best. http://www.america2050.org/pdf/Where-HSR-Works-Best.pdf.

Table 5-13 Local and Regional Rail Planning

Plan	Description
Amtrak Northeast Corridor (NEC)	• Amtrak's NEC is an intercity rail line that operates between Boston's South Station and Washington, D.C. via New York City, also serving the major destinations of Providence, Rhode Island; New Haven, Connecticut; Philadelphia, Pennsylvania; and Baltimore, Maryland. Amtrak operates two services between Boston and Washington, D.C.: the high-speed Acela Express and the lower-speed Northeast Regional that makes local stops along the route. Logan Airport passengers can connect directly to Boston's South Station via Silver Line bus rapid transit (BRT) service, taxi, or other unscheduled modes. Silver Line service from Logan Airport to South Station is free as it is subsidized by Massport. • Amtrak's share of the Northeast total passenger market has increased substantially since the introduction of Acela Express service in 2000. In FY 2022, the NEC carried 9.2 million trips on its Acela Express and Northeast Regional services, 109 percent more than in FY 2021.[17,18] Acela Express accounted for about 2.1 million trips, while the Northeast Regional accounted for approximately 7.1 million trips. • Travel times on the Acela Express range from approximately 3.75 hours from Boston to New York to approximately 6.75 hours from Boston to Washington, D.C. Travel times on the Northeast Regional range from about 4.25 hours from Boston to New York to approximately 8.00 hours from Boston to Washington, D.C. On weekdays, a total of 18 daily departures are offered from Boston-South Station to New York-Penn Station, of which about half are Acela Express. On Saturdays and Sundays, a total of 12 departures and 14 departures are offered from Boston-South Station to New York, respectively.[19] • Amtrak share may rise over the next few years as it replaces the old "Amfleet I" cars with contemporary rail equipment.[20] Amtrak will also introduce next-generation Acela rail cars (scheduled to enter service in late 2024), which will increase the number of seats per train by approximately 25 percent and operate at top speeds 10 mph higher than current top speeds of 150 mph.[21]

17 Amtrak. FY 2022 Company Profile. https://www.amtrak.com/national-facts.

18 Amtrak. FY 2021 Company Profile. https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/nationalfactsheets/Amtrak-Company-Profile-FY2021-030922.pdf.

19 Amtrak. 2022. Train Schedules and Timetables. https://www.amtrak.com/train-schedules-timetables.

20 Amtrak. "Amtrak Five Year Equipment Asset Line Plan: Base (FY 2019) + Five Year Strategic Plan (2020-2024)," https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/businessplanning/Amtrak-Equipment-Asset-Line-Plan-FY20-24.pdf.

21 Amtrak. "New Acela Fleet," https://www.amtrak.com/next-generation-high-speed-trains.

Table 5-13 Local and Regional Rail Planning

Plan	Description
Northeast Corridor Capital Investment Program, Next-Generation High Speed Rail Plan, and Connect NEC 2035	• In 2010, two reports on the NEC were released: the Northeast Corridor Infrastructure Master Plan, which documented expanded capacity and upgrades through 2030,[22] and a next-generation high-speed rail proposal titled, "A Vision for High-Speed Rail in the Northeast Corridor." The high-speed rail plan predicts a shift from auto and air to rail between New York City and Boston, nearly eliminating the air market by 2050.[23] • The two plans were integrated into a single coherent service and investment program in July 2012, called the NEC Capital Investment Program (CIP). The Program would advance the near-term projects outlined in the Master Plan, while phasing improvements to the Acela Express high-speed.[24] The NEC Commission publishes a five-year NEC CIP annually, issuing the most recent FY23-27 CIP in October 2022.[25] • The Federal Railroad Administration (FRA) developed the NEC Project Inventory, issuing a list of priority projects in the NEC and establishing a systematic approach to guide the $16 billion in funding awarded for the NEC passenger rail service.[26] The list aims to reverse decades of underinvestment in infrastructure by proposing replacement and rehabilitation of vital assets, as well as major rail station upgrades and expansions. Subsequent versions of the NEC Project Inventory will be published every two years. • Released in 2023, *Connect NEC 2037* (C37) is the most recent reinvestment plan for the NEC and includes a 15-year service development and infrastructure plan to address the NEC's backlog of state-of-good repair needs and future growth. • Work along the Rhode Island stretch has improved train operations and passenger experience. In 2017, the Rhode Island Department of Transportation (RIDOT) and Amtrak completed the Kingston Station Capacity Expansion project. The project constructed a third track, enabling higher speed Acela trains to safely bypass regional trains.[27] The renovation of Providence Station began in 2022 and is set to finish in 2024.[28]

22 The NEC Master Plan Working Group. 2017. The Northeast Corridor Infrastructure Master Plan. https://railroads.dot.gov/elibrary/northeast-corridor-infrastructure-master-plan.

23 Amtrak. September 2010. A Vision for High-Speed Rail in the Northeast Corridor. https://www.uprfbmwed.org/Docs/amtrak/Amtrak_Memos/Amtrak_NECHSRReport92810LR%5B1%5D.pdf.

24 Amtrak. July 2012. The Amtrak Vision for the Northeast Corridor: 2012 Update Report. amtrak-vision-for-the-northeast-corridor-july-2012.pdf.

25 NEC Commission. October 2022, FY23-27 CIP. https://nec-commission.com/app/uploads/2022/10/FY23-27-Capital-Investment-Plan-01-Body-Oct-22.pdf.

26 FRA. November 2022, NEC Project Inventory. https://railroads.dot.gov/elibrary/nec-inventory.

27 Amtrak. State of Rhode Island Fact Sheet FY 2019. https://www.amtrak.com/content/dam/projects/dotcom/english/public/documents/corporate/statefactsheets/RHODEISLAND19.pdf.

28 RIDOT. Providence Station State of Good Repair Project. https://www.dot.ri.gov/projects/PVDStation/index.php.

Table 5-13 Local and Regional Rail Planning

Plan	Description
Compass Rail	• In October 2023, MassDOT proposed the Compass Rail intercity passenger rail, which would include East-West and North-South services with a Springfield, MA hub.[29] The initiative aims to increase transportation options, support economic development, improve the freight network, and induce a modal shift. • Completed in 2016, the Northern New England Intercity Rail Initiative (NNEIRI) was a collaboration between MassDOT, the Vermont Agency of Transportation, and the Connecticut Department of Transportation (CTDOT) "to examine…more frequent and higher speed intercity passenger rail service" along the Inland Route and the Boston to Montreal Route corridors.[30] • MassDOT conducted an East-West Passenger Rail Study to examine how to make passenger rail service from Boston to Springfield and Pittsfield a competitive travel option along the corridor. The study, released in January 2021, assessed six alternatives, including high-speed rail and potential infill stations.[31] • In November 2021, MassDOT released the Massachusetts Intercity Rail Governance White Paper to assess options for passenger rail in Western Massachusetts. The Western Massachusetts Passenger Rail Commission was established in 2022 to explore potential public entities to implement East-West Passenger Rail.[32] • Through the Consolidated Rail Infrastructure and Safety Improvements (CRISI) Program, MassDOT has won more than $108 million for the Inland Route, with design to begin in 2024.[33,34] Compass Rail includes the proposed Inland Route and service between Boston and Albany to advance the East-West Passenger Rail vision.[35] In 2022, MassDOT was awarded almost $1.8 million in CRISI funding for preliminary engineering and environmental review to improve rail infrastructure, safety, and capacity near Springfield Union Station.[36]

29 MassDOT. Compass Rail: Passenger Rail for the Commonwealth, October 2023. https://www.mass.gov/doc/compass-rail-passenger-rail-for-the-commonwealth-presentation-to-the-board-on-october-18-2023/download.

30 MassDOT. NNEIRI. https://www.mass.gov/files/documents/2018/05/24/NNEIRI_StudySummary.pdf.

31 Available online at https://www.mass.gov/east-west-passenger-rail-study.

32 Available online at https://malegislature.gov/Events/Hearings/Detail/4411.

33 MassDOT. Compass Rail: Passenger Rail for the Commonwealth, October 2023. https://www.mass.gov/doc/compass-rail-passenger-rail-for-the-commonwealth-presentation-to-the-board-on-october-18-2023/download.

34 MassDOT. Healey-Driscoll Administration Secures More Than $108 Million for Train Corridor Improvements Between Springfield and Worcester, September 2023. https://www.mass.gov/news/healey-driscoll-administration-secures-more-than-108-million-for-train-corridor-improvements-between-springfield-and-worcester.

35 MassDOT. Compass Rail: Passenger Rail for the Commonwealth, October 2023. https://www.mass.gov/doc/compass-rail-passenger-rail-for-the-commonwealth-presentation-to-the-board-on-october-18-2023/download.

36 MassDOT. Healey-Driscoll Administration Secures More Than $108 Million for Train Corridor Improvements Between Springfield and Worcester, September 2023. https://www.mass.gov/news/healey-driscoll-administration-secures-more-than-108-million-for-train-corridor-improvements-between-springfield-and-worcester.

Table 5-13 Local and Regional Rail Planning

Plan	Description
Boston-South Station Expansion	• MassDOT evaluated options to expand Boston's South Station Rail Terminal capacity and related layover capacity to meet high-speed, intercity, and commuter rail services needs on the NEC and the Massachusetts Bay Transportation Authority's (MBTA's) South Side system. South Station operates above design capacity and constrains regional rail mobility.[37] The proposed South Station Expansion Project aims to increase passenger capacity, improve service reliability, contribute to city-building in Boston, and reopen Dorchester Avenue for public use.[38] The MBTA operates the Silver Line, which provides a direct connection between South Station and all Logan Airport passenger terminals. • The U.S. Department of Transportation (U.S. DOT) awarded MassDOT a grant to improve South Station's Tower 1 interlocking, critical infrastructure that distributes trains to and from the station.[39] This early action project will provide operating benefits, including reliability and resiliency. Construction began in 2023 with projected completion in 2028. • The station is also undergoing improvements as part of the South Station Air Rights Project, with anticipated completion in 2025. A collaborative effort between the Boston Planning and Development Agency (BPDA), the private developer, and the MBTA, this project will expand the outdoor concourse area, increase bus terminal capacity by more than 50 percent, provide more convenient connections between the bus and rail terminals, and construct a new mixed-use tower.[40]
Commuter Rail Services	• RIDOT allocates some of its federal funding to the MBTA under the Pilgrim Partnership in return for commuter rail service between Boston and Rhode Island. On weekdays, 20 round trips are provided between Boston and Providence, approximately half of which serve PVD. • RIDOT, in cooperation with the City of Pawtucket and U.S. DOT, invested $63 million in a new MBTA commuter rail station in Pawtucket, Rhode Island. The station opened in January 2023,[41] and will attract passengers in the overlapping catchment area along the Providence Line.

37 MassDOT. About this Project. https://www.mass.gov/lists/south-station-expansion-documents.

38 MassDOT. October 2017. South Station Expansion Final Environmental Assessment and Section 4(f) Determination. https://www.mass.gov/lists/south-station-expansion-final-environmental-assessment.

39 MBTA. South Station Tower One Interlocking Project. https://www.mbta.com/projects/south-station-tower-one-interlocking-project.

40 MBTA. South Station Transportation Center Improvements. https://www.mbta.com/projects/south-station-transportation-center-improvements.

41 RIDOT. Pawtucket/Central Falls Transit Center. http://www.dot.ri.gov/projects/PCF/index.php.

Table 5-13 Local and Regional Rail Planning

Plan	Description
Massachusetts State Rail Plan[42]	• In 2010, MassDOT developed the first State Rail Plan which outlines a 20-year vision and action plan for rail services in Massachusetts. Massport advised and supported MassDOT on this plan.
Commuter Rail Services *continued*	• In April 2019, construction began on the $3.42 billion South Coast Rail corridor project to expand the commuter rail Middleborough Line from Boston to the New Bedford and Fall River areas. The $1 billion Phase 1 will bring six new stations and two new layover facilities in 2024.[43,44] Phase 2 will provide service to the South Coast through the Town of Stoughton.[45] • In October 2019, the MBTA launched a one-year pilot to test weekday commuter rail service to Foxboro. The MBTA operated 10 daily round trips as part of the Service Pilot, with 500 parking spaces available at Foxboro Station. The MBTA suspended the service pilot in 2020 as a result of the pandemic. This pilot was relaunched in Fall 2022, and commuter rail service to Foxboro was made permanent in October 2023.[46]
MBTA Rail Transformation	• The MBTA's 2020 Rail Vision planning study identified cost-effective strategies to transform the MBTA's existing Commuter Rail system to better support improved mobility and economic competitiveness in the Boston region. The study assessed different approaches to increase frequency, reduce travel time, and improve connectivity on the current network. The project evaluated six alternatives for a future MBTA rail system to understand the costs, ridership potential, and operational feasibility of these alternatives.[47] • While the study was completed pre-pandemic and reflects pre-pandemic mobility patterns, the MBTA continues to advance planning for elements of a Regional Rail Transformation. The Regional Rail Transformation has resulted in schedule changes beginning in spring 2021 to implement more frequent bi-directional service and hourly clock face service on some lines. • The Regional Rail Transformation has also continued planning for capital investments and electrification.[48]

42 MassDOT. 2018. State Rail Plan. https://www.mass.gov/service-details/rail-plan.

43 MBTA, South Coast Rail. https://www.mbta.com/projects/south-coast-rail.

44 MassDOT. South Coast Rail. https://www.mass.gov/south-coast-rail.

45 *Ibid.*

46 MBTA. Foxboro Weekday Service Pilot. https://www.mbta.com/projects/foxboro-weekday-service-pilot.

47 MBTA. Rail Vision. https://www.mbta.com/projects/rail-vision.

48 MBTA. Regional Rail Transformation Update. June 23, 2022.

Table 5-13 Local and Regional Rail Planning

Plan	Description
Northern Tier Passenger Rail Study	• MassDOT is studying alternatives for passenger rail service from North Adams to Greenfield and Boston.[49] The new service would offer an alternative means of transportation from western and central Massachusetts to Boston and facilitate travel to the northern areas of Berkshire, Franklin, and Worcester counties from Boston.[50] The study aims to support economic development along the Northern Tier corridor, promote transportation equity, and minimize transportation impacts on public health and the environment.

Table 5-14 Regional Transportation Planning

Plan	Description
Regional Airport Cooperative Planning Efforts	
New England Regional Airport System Plan (NERASP)[51] – Commercial Service Airports	• Federal Aviation Administration (FAA) New England Region, in concert with the New England Airport Directors and New England State Aviation Directors, completed the *NERASP*.[52] (2006)
New England Regional Airport System Planning – General Aviation (NERASP-GA)	• New England aviation officials, in collaboration with the FAA, studied the GA airport system, including primary commercial service airports. This data will guide FAA in deciding on capital investments considering high operational costs, reduced activity, old infrastructure, and limited state funds for improvements.[53]

49 MassDOT. Northern Tier Passenger Rail Study. https://www.mass.gov/northern-tier-passenger-rail-study.

50 MassDOT. Northern Tier Passenger Rail Study Public Meeting. https://storymaps.arcgis.com/stories/f8b3c1274ac246b19499d1c092893b08.

51 Information on the NERASP-GA study can be found at https://www.faa.gov/airports/new_england/planning_capacity/airport_system_plan/.

52 The NERASP, which was published by the FAA in 2006, includes Logan International Airport and these 10 regional airports: BGR, BDL, BTV, BED, MHT, PWM, PSM, PVD, HVN, and ORH.

53 The Evolving Role of our General Aviation Airports and Their Significance to New England - A Profile of the New England General Aviation Airports: Phase 1 Summary of Findings, September 2015, prepared for New England State Aviation Directors by Louis Berger, Airports Solutions Group, and ICF International.

Table 5-14 Regional Transportation Planning

Plan	Description
Regional Cooperative Planning Efforts	
Boston Metropolitan Planning Organization (MPO)	• Massport supports multimodal transportation planning and improved integration of its facilities in the Boston area through its permanent voting membership on the Boston MPO and by providing input on the Boston MPO's policy and programming decisions including the Transportation Improvement Program (TIP). • Massport actively participates in MPO's decision-making board, participating in related policy decisions, and utilizing Central Transportation Planning Staff (CTPS) to support its ground transportation planning initiatives.
Metropolitan Area Planning Council (MAPC) *MetroCommon 2050*	• Massport is an ex-officio member of the Executive Committee of MAPC, a regional planning agency that promotes smart growth and regional collaboration. MAPC membership includes 101 municipal government representatives, 21 gubernatorial appointees, 10 state officials, and three City of Boston officials. MAPC adopted *MetroCommon 2050* in 2021, a land-use and policy plan advocating for inclusive growth, mobility, equal housing, wealth and health equity, representative government, and climate change mitigation.[54]
Conference of New England Governors (CONEG) and the Conference of New England Governors and Eastern Canadian Premiers (NEG/ECP)	• The CONEG is a formally established body that coordinates regional policy programs in the areas of economic development, transportation, environment, energy, and health, among others. • NEG/ECP coordinates policies of common interest to achieve a greater balance between modes to increase transportation capacity without overburdening Logan Airport and the New England aviation system. The six New England states and the five Eastern Canadian provinces have worked cooperatively since 1973. • MassDOT has a representative on the NEG/ECP Transportation and Air Quality Committee, which covers regional transportation issues and infrastructure development, use, and efficiency. • In 2015, the NEG/ECP passed and implemented the Climate Change Action Plan, which provided direction on reducing greenhouse gas emissions and a target range of 35 to 45 percent below 1990 levels by 2030.[55]

54 MAPC, *MetroCommon 2050*. https://metrocommon.mapc.org/.

55 Conference of NEG/ECP. August 30, 2015. Resolution 39-1, Resolution Concerning Climate Change.

Table 5-14 Regional Transportation Planning

Plan	Description
Boston and Statewide Long-Term Transportation Vision	
Long-Range Transportation Plan of the Boston Region MPO	• As a member of the MPO board, Massport is an active participant in the development of the Boston MPO's Long-Range Transportation Plan. For the Airport, the plan's long-range vision finds that support for interconnected ground transportation systems and access to the Airport and air cargo are critical. • In August 2019, the Boston MPO adopted its current LRTP, *Destination 2040*, to help the region address challenges related to increased congestion, stressed transportation infrastructure, and climate change to the long-term vitality of the region. New funding opportunities as part of Destination 2040 include transit modernization, dedicated bus lane infrastructure, and climate resiliency. • The next LRTP, *Destination 2050*, will be adopted in 2023. Destination 2050 will be designed to address the forces and uncertainties that will shape the Boston region between the current environment and 2050.
Massachusetts State Freight Plan	• MassDOT initiated a comprehensive *Massachusetts State Freight Plan* in 2022, with Massport's participation as a member of the leadership Freight Advisory Committee, focusing on near and long-term freight systems. • This plan includes the designation of new miles of Critical Urban and Rural Freight Routes to the National Highway Freight Network, improving connections to Logan Airport and Massport maritime facilities, and will assist in identifying cargo trends and supporting urban supply chains.
Focus40	• *Focus40* is a 25-year investment plan for the Massachusetts Bay Transportation Authority (MBTA) released in March 2019 to meet the needs of the Boston Region through the year 2040. The *Focus40* plan considers all rapid transit, commuter rail, bus, ferry, and paratransit services,[56] and future changes in technology, demographic shifts, mobility preferences, infrastructure challenges, as well as climate change impacts.[57,58] Some projects outlined in the plan have been implemented or are currently underway including the Green Line Extension to Union Square in Somerville (March 2022) and the Medford Branch (December 2022). • Massport actively participated in the Focus40 planning process to provide input on the role of Logan Airport and other Massport assets. The proposed Silver Line extension of service to Everett and a direct connection between the Red and Blue Lines would improve public transit access to Logan Airport.[59,60]

56 Transportation for persons with disabilities to supplement public transportation systems.

57 MassDOT. 2022. Focus40: Planning in the Face of Uncertainty. https://www.mbtafocus40.com/region-in-2040.

58 MassDOT. 2022. Focus40. https://www.mbtafocus40.com/.

59 MBTA. Silver Line Extension Alternatives Analysis. https://www.mbta.com/projects/silver-line-extension-slx-alternatives-analysis.

60 MBTA. FY23-7 Capital Investment Plan (CIP). https://cdn.mbta.com/sites/default/files/2022-05/2022-05-26-fy23-27-mbta-final-cip-public-document-accessible.pdf.

Table 5-14 Regional Transportation Planning

Plan	Description
Go Boston 2030	• The City of Boston's comprehensive transportation plan, GoBoston 2030, released in 2017, is intended to guide transportation planning policy and infrastructure investments through 2030 while following the guiding principles of equity, economic opportunity, and climate responsiveness. The plan aims to improve safety, expand access, increase reliability, reduce car use, reduce emissions, and increase affordability. • As of May 2022, 30 projects are in implementation; 11 projects are in design; and 17 projects have not yet started. Massport, a key stakeholder in the plan, contributes to the project affecting its facilities.
Water Transportation Advisory Council and Ferry Study	• Massport is a participating member of the Water Transportation Advisory Council for the Boston region. • Massport served as a council member on a study in 2019, led by Boston Harbor Now that evaluated water transportation needs in Boston Harbor. The study identified three potential water service corridors and developed business plans for rider assessment and implementation feasibility.
Bus Transformation	• As part of its 5-year CIP, the MBTA is improving bus service through the Better Bus Project, which includes planning for Bus Network Redesign (BNRD) and Facility Modernization as well as Bus Electrification.[61] • In 2019, the MBTA purchased five battery electric buses (BEBs) for the Silver Line, and projects are underway to modernize maintenance facilities to accommodate BEBs. Massport purchased ten new Silver Line electric and hybrid buses in 2022 as part of the MBTA procurement program. • The BNRD will include increased service frequencies of 15 minutes or better for the Silver Line.
South Boston Transportation Action Plan	• Launched in late 2022, the South Boston Transportation Action Plan builds upon Imagine *Boston 2030* and *Go Boston 2030*, studying key transportation connections to and within the South Boston area. It will evaluate safety concerns and recommend improvements to simplify intersections for all users, improve the transit network, expand the bike network, and improve walkability.[62]

61 MBTA. Better Bus Project. https://www.mbta.com/projects/better-bus-project.

62 BDPA South Boston Transportation Action Plan, https://www.bostonplans.org/news-calendar/news-updates/2022/11/08/bpda-launches-south-boston-transportation-action-plan.

Table 5-14 Regional Transportation Planning

Plan	Description
South Boston Waterfront Transportation Plan	• In 2013, Massport, the City of Boston, MassDOT, and the Massachusetts Convention Center Authority created a sustainable transportation plan for the South Boston Waterfront, providing solutions for growth, transportation needs, and area improvement, while preserving neighborhood benefits. Massport continues to engage with other agency partners in the implementation of recommendations from this plan. • Since, the City of Boston, jointly led by the Boston Planning and Development Agency (BPDA) and the Boston Transportation Department (BTD), has developed a draft South Boston Strategic Transit Plan to improve the operations, capacity, and connectivity of the transit network serving the South Boston Seaport.
Local Planning Efforts	
Imagine Boston 2030[63]	• *Imagine Boston 2030*, was released in 2017 and is the City of Boston's comprehensive development plan, and addresses topics including housing, mobility, climate change, open space, equity, health, and transportation. • Massport continues to engage with the City of Boston and other stakeholders to shape the implementation of relevant strategies and align its planning efforts with the plan's strategies.[64]
Climate Ready Boston	• Climate Ready Boston, released in 2016, aims to guide Boston toward a more affordable, equitable, connected, and resilient future. Components of the Climate Ready Boston plan include: updating climate projections; completing vulnerability assessments; identifying impacts to focus areas; and creating more climate resiliency initiatives. The City has developed a pilot tool to track its implementation progress.[65] • In 2022, Phase II Costal Resilience Solutions for East Boston and Charlestown were released and included a study of the East Boston waterfront that was not included in the prior Phase I study.[66]
Coastal Resilience Solutions for South Boston	• The City of Boston published the *Coastal Resilience Solutions for South Boston* report in October 2018. This plan presents near- and long-term visions for reducing risk due to sea level rise and coastal flooding in South Boston. This is the second neighborhood coastal resilience plan from the Climate Ready Boston initiative.

63 City of Boston. Imagine Boston 2030. https://www.boston.gov/civic-engagement/imagine-boston-2030/.

64 List of the planning initiatives set forth by the BPDA can be found via this link: https://www.bostonplans.org/planning/planning-initiatives.

65 City of Boston Progress Summary & Details. 2022. https://www.boston.gov/departments/environment/climate-ready-boston-progress/.

66 City of Boston, Climate Ready Boston. 2022. https://www.boston.gov/departments/environment/climate-ready-boston/coastal-resilience-east-boston.

6. Ground Access

By 2022, passenger activity levels began to recover at a faster pace than the previous year as the aviation industry continued to recover from the COVID-19 worldwide pandemic and airport passengers returned to international travel. In 2022, passenger activity levels totaled 36.1 million passengers, which was about 15 percent lower than the 2019 pre-pandemic levels.

To respond to the changes in passenger air travel demand, Massport continues to evaluate and plan for the recovery of air passenger activity and remains committed to implementing the broad range of ground access and trip reduction strategies, which are outlined throughout this chapter. Massport continues to carefully review both on and off-Airport ground transportation activity levels and will adjust its ground access programs to align with air passenger and employee needs. High-occupancy vehicle (HOV) services have resumed, and further ground access improvements will continue to be reviewed and adjusted according to current conditions. Massport remains committed to implementing project-related ground access mitigation strategies, as documented in Chapter 10, *Project Mitigation*.

Massport remains committed to promoting numerous HOV modes, including transit and shared-ride options to enhance on-Airport roadway and curbside operations, alleviate constraints on parking, reduce drop-off and pick-up activities, and improve customer service. Massport has a comprehensive, multi-pronged trip reduction strategy to diversify and enhance ground transportation options for passengers and employees traveling to and from Logan Airport. The ground transportation strategy is designed to offer passengers a choice of HOV modes that are convenient, reliable, and reduce environmental and community impacts.

The strategy also aims to provide sufficient on-Airport parking for air passengers choosing automobile access modes or who have limited HOV options. Improving the Airport's multimodal connectivity can alleviate traffic congestion and provide environmental benefits by reducing vehicle trips, **vehicle miles traveled (VMT)**, and **greenhouse gas (GHG)** emissions associated with travel to and from Logan Airport. The cost, speed, convenience, safety, and reliability of transportation modes connecting to the Airport affect how passengers and employees choose among these access modes. Offering a range of ground access options also improves the customer experience for Airport users.

The following efforts encourage passengers, employees, and Airport users to choose more environmentally sustainable modes of ground transportation:

- Massport continues to invest in and operate Logan Airport with a goal of increasing the number of passengers and Airport employees arriving by HOV, including transit, and other shared-ride modes of transportation. Massport provides financial incentives to promote HOV use and reduce single occupancy vehicle (SOV) trips or **deadhead trips.** Massport implements initiatives to improve HOV service availability, HOV service quality, HOV supporting infrastructure, marketing for HOV options, and traveler information about shared-ride alternatives.
- Massport promotes initiatives to reduce the total number of vehicles that access Logan Airport; in particular, the environmentally undesirable single passenger drop-off and pick-up mode, which generates up to four vehicle trips instead of two and contributes to greater terminal area roadway congestion.[1]
- The Airport parking supply is managed with the intent to reduce drop-off and pick-up modes that result in deadhead trips, which promotes long-term, rather than short-term, parking. Long-term parking reduces the number of daily trips to Logan Airport; supports efficient use of parking facilities; provides a better overall customer experience; and complies with the provisions of the **Logan Airport Parking Freeze**.[2]

In addition to highlighting more recent changes to ground transportation services, operations, and pricing, this chapter reports on ground access conditions and activity levels in 2022 and past conditions. In this chapter, activity levels refer to a measurement of ridership on various ground access modes (unless noted otherwise) and traffic volumes. This chapter provides an overview of parking demand and its impacts under Logan Airport's constrained parking supply. Regional transportation efforts related to the Airport, as well as planning efforts to diversify transportation options in the New England region, are discussed in Chapter 5, *Regional Transportation*.

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1 If an air passenger is dropped off when departing on a flight and is picked up upon return, that single air passenger generates a total of four ground access trips: two for the drop-off trip (one inbound to Logan Airport, one outbound from Logan Airport) and two for the pick-up trip (one inbound to Logan Airport, one outbound from Logan Airport). The air passenger may be dropped off and picked up in a private vehicle, taxi, RideApp, or a black car limousine and the vehicle may not carry a passenger during all segments of travel to and from Logan Airport.

2 310 Code of Massachusetts Regulations 7.30; 40 Code of Federal Regulations 52.1120.

2022 Ground Access Key Findings

The following details key findings of ground access at the Airport in 2022:

In 2022, HOV mode share reached 38.4 percent, exceeding the 2022 target of 35.5 percent.

- Research indicates that even post-pandemic, Logan Airport will continue to be one of the top U.S. airports in terms of HOV mode share, including transit mode share.
- Massport set a target to reach a 35.5 percent HOV mode share by 2022 and 40 percent by 2027. The *2022 Air Passenger Ground-Access Survey* found HOV mode share reached 38.4 percent, which exceeds the 2022 target and indicates Massport is also on track to meet the 2027 target.
- Key initiatives implemented in 2022 or planned for the immediate future to promote sustainable transportation mode usage, improve Airport roadway and curbside operations, and alleviate traffic congestion and parking constraints include:
  - Promoting Logan Express ridership by expanding offsite parking options, increasing trip frequency, investing in facility upgrades, and providing reduced fares for online ticket purchases.
  - Purchasing ten replacement **Massachusetts Bay Transportation Authority (MBTA)** Silver Line buses to enhance service to the Logan Terminals as part of a Spring 2023 MBTA procurement; and
  - Continuing the ***RideApp*** *Management Plan* implementation to improve roadway function at the Airport, including a focus on improving ride **rematch** and promoting passenger-shared rides.
- Average weekday on-Airport VMT in 2022 was 21.6 percent lower than the VMT on-Airport in 2019, with 164,625 average daily miles traveled in 2022. Airport activity and on-Airport VMT were trending higher in 2022 compared to 2021 due to the reduction in air travel restrictions and continued transit capacity limitations associated with COVID-19 social distancing guidelines.
- Each type of ground transportation service available in 2022 showed increased ridership compared to 2021, indicating access modes to Logan Airport are returning to pre-pandemic usage levels and trends.
- Mode share data from the *2022 Air Passenger Ground-Access Survey* showed some lingering effects from the pandemic on passenger choices in travel to and from the Airport, with private automobiles transporting more passengers than previously reported and bus services transporting less.

Future Forecast Ground Access Key Findings

The following details key findings of ground access at the Airport for the **Future Planning Horizon**:

- In the next 10 to 15 years (the Future Planning Horizon) Logan Airport is anticipated to reach 53.5 million air passengers (MAP). A VMT analysis was conducted for the Future Planning Horizon using the VISSIM model of Logan Airport. On-Airport vehicle trips were estimated based on available flight forecast information and anticipated mode shares.

- In the Future Forecast, daily on-Airport VMT is estimated to be 212,022, which is 1 percent more than the 2019 daily VMT of 209,900 and 29 percent more than the 2022 daily VMT of 164,625. The increase in VMT is primarily attributed to forecast increase in air passenger activity.
- Massport has a standing policy to maintain ground access operations and minimize traffic congestion to accommodate passengers arriving and departing the Airport. This policy has resulted in several infrastructure and operational modifications that complement broader policy changes and allow terminal-area roadways and curbsides to continue functioning adequately and minimize vehicle idling and associated emissions. Some modifications, such as the Terminal B/C Roadway project, the Terminal C Curbside Optimization, and changes to Terminal B curbsides and RideApp operations are already complete. These modifications appear to have a lasting benefit on future airport ground access conditions and are projected to improve terminal roadway congestion through future peak summer average day forecast levels.

6.1 Ground Transportation Modes of Access to Logan Airport

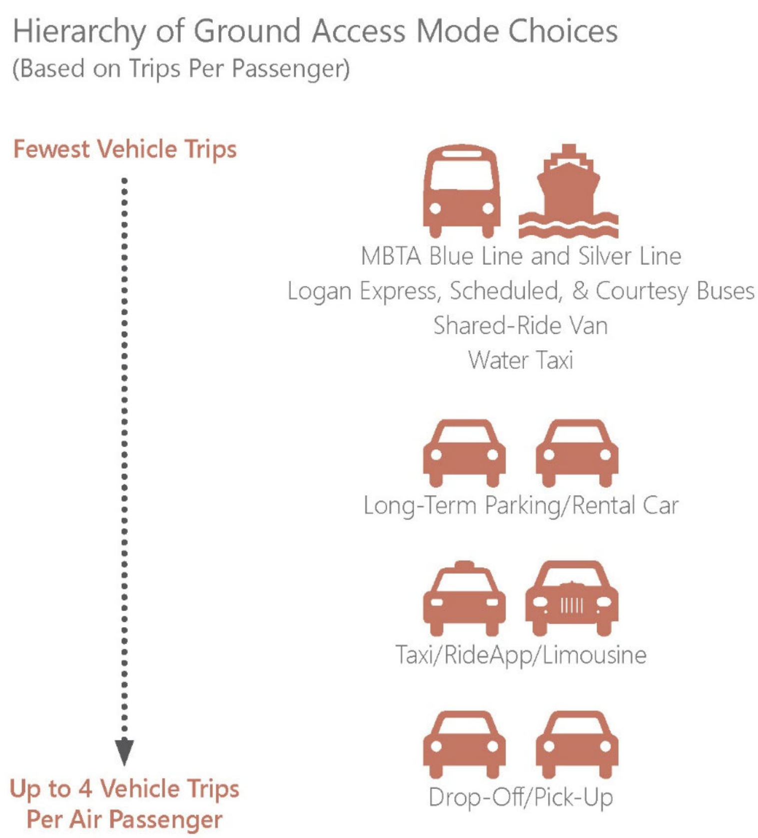
For over four decades, Logan Airport *Environmental Data Reports (EDRs)* and ESPRs have tracked and reported on ground access and ground transportation at the Airport. Air passengers and employees have a variety of options for getting to and from Logan Airport, including:

- Public transit modes, such as the MBTA Blue Line subway, the rapid transit Silver Line 1 bus service, other MBTA bus routes, and water transportation
- Massport's Logan Express scheduled bus service
- Scheduled buses and vans
- Courtesy shuttle buses
- Charter buses
- Private automobiles
- Unscheduled, or on-demand, private black car limousines and vans
- Taxis
- Rental cars
- RideApp services, such as Uber™ and Lyft™

Mobile ride-sharing application (RideApp) services, such as Uber™ and Lyft™, are increasingly becoming a mode of choice for ground access at airports throughout the country. To address the substantial shift to RideApp services, Massport reported on its comprehensive plan to address RideApp-related impacts in the *2017 ESPR*, and a status update of that plan is provided later in this chapter.

HOV, including transit, and shared-ride modes are designed for the efficient transport of multiple travelers within a single vehicle. With a higher occupancy, the number of vehicle trips per passenger is low compared to single occupancy private vehicles. Private vehicles that park at the Airport or at an off-Airport lot generate a single-vehicle trip to the Airport for the departing air passenger and a single-vehicle trip from the Airport for the arriving air passenger. Even less desirable, vehicles that do not remain at the Airport for an air passenger's trip duration, such as a private vehicle that drops off an air passenger at the curb, generate two trips, a trip to and a trip from the Airport, for a departing air passenger and an additional two trips for the arriving passenger. Taxis, RideApp services, and black car limousines may also result in a trip without passengers (deadhead trip) when they depart Logan Airport empty after dropping off an air passenger, particularly in the morning, or when these vehicles arrive empty at the Airport to pick-up air passengers. As **Figure 6-1** shows, when measured in terms of the fewest number of vehicle trips generated, HOV is the most environmentally desirable mode, followed by drive-and-park, with the least desirable being drop-off and pick-up modes.

Figure 6-1 Ground Access Mode Choice Hierarchy



Source: VHB.
Notes: Short-term parking is included under "Drop-off/Pick-up."
Rental cars are included in the "Long-Term Parking" category.

6.2 2022 On-Airport Vehicle Traffic: Volumes and Vehicle Miles Traveled (VMT)

The effects of ground transportation associated with airport operations are measured in two ways; the number of vehicles that enter the airport and the vehicle miles traveled (VMT) by those vehicles while on airport roadways. This section reports on Logan Airport's traffic-related activity for 2022, specifically:

- Gateway traffic volumes (airport access points)
- Estimated On-Airport VMT

Massport's leadership in and commitment to developing, promoting, and providing alternative means of ground transportation for access to and from Logan Airport is key to reducing gateway traffic volumes and on-Airport VMT. The diverse range of environmentally responsible ground transportation modes by which air travelers, employees, and other Airport users can access the Airport reduces reliance on automobile travel, minimizes traffic congestion, and improves air quality.

6.2.1 Gateway Traffic Volumes

Gateway roadways are defined as access points to and from Logan Airport, which primarily include:

- Route 1A to and from the north
- Sumner and Callahan Tunnels (Route 1A to and from the south)
- Interstate 90 (I-90) Ted Williams Tunnel ramps (to and from east and west)
- Frankfort Street to Service Road to and from the northeast.

Figure 6-2 shows the primary gateway roadway infrastructure access points at Logan Airport in 2022.

6.2.1.1 Data Collection and Annual Average Daily Calculation Method

The Airport's gateway roadways are equipped with permanent traffic count stations, which are part of the Airport-wide **Automated Traffic Monitoring System (ATMS)**. These stations provide the data used to calculate:

- **Annual average daily traffic (AADT)**
- **Annual average weekday daily traffic (AWDT)**
- **Annual average weekend daily traffic (AWEDT)**

Since these data are automatically collected continuously throughout the year, seasonal adjustment factors are only necessary when significant gaps in the data occur, typically due to equipment failure or malfunction, or due to construction activity. Seasonal adjustment factors, when used, are generally estimated from a combination of the monthly variation of counts from other ATMS stations, or from data collected from the same station in the previous year, at a similar time.

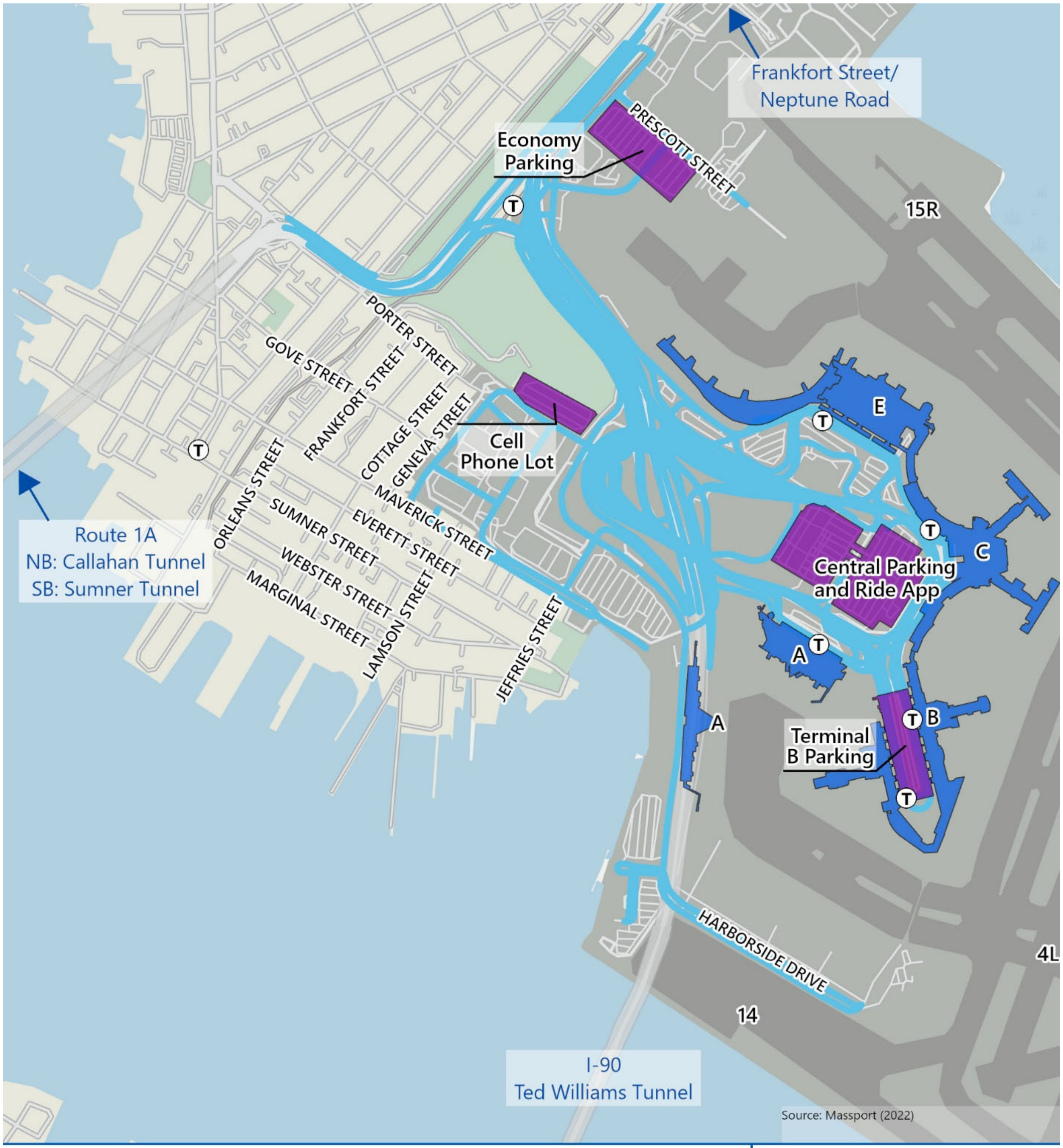


Figure 6-2 Logan Airport Roadways	2022 Environmental Status and Planning Report

Terminal Buildings
Parking Facilities
MBTA Stops
Airport Roadways

Status as of 12/2022.

0 450 900 1,800 Feet

6.2.1.2 Annual Average Daily Activity Levels

Table 6-1 summarizes the average daily gateway traffic volumes at Logan Airport for the two most recent ESPR submission years, 2011 and 2017, and 2018 through 2022. The historical high year of 2011 is used as a frame of reference for consistency in comparison across the ground access metrics (see Section 6.3.2 for more information). A detailed table with average daily gateway traffic volume data for the years 2010 through 2022 is found in Appendix H*, Ground Access Supporting Documentation*, and includes AADT, AWDT, AWEDT, and annual air passengers' data for reference.

The AADT entering and departing Logan Airport via its gateway roadways increased by 26.1 percent between 2021 and 2022 but was 18.9 percent less than the 2019 AADT benchmark values established for this ESPR. The change in average daily traffic can be attributed primarily to the impacts of COVID-19 and a slow recovery to pre-pandemic activity levels, as illustrated by:

- A roughly 15.1 percent decrease in air passenger activity between 2019 and 2022; and
- The associated decrease in riders across all applicable transportation modes.

It is notable that unlike in 2021, ridership numbers in 2022 (for all applicable surface transportation modes [including HOV]) rebounded to align with the Airport passenger numbers more closely, although both the number of riders and passengers in 2022 were still less than reported 2019 levels. This trend was first reported in 2021 based on the preliminary 2022 data available and was confirmed when the complete 2022 dataset was reviewed and analyzed.

6.2.2 2022 On-Airport VMT

On-Airport VMT is calculated based on the total number of miles traveled by vehicles on Logan Airport's roadways. VMT is an indication of the level of traffic on roadways in specific areas and at specific times. VMT is an important metric that is used to calculate on-Airport motor vehicle air quality emissions. As discussed in the *2020/2021 EDR*, to estimate on-Airport VMT, Massport migrated from the previous VISSIM[3] microsimulation model to a new spreadsheet-based volumetric model. The spreadsheet-based volumetric model was in place from 2018 to 2021 and took advantage of the data available through Massport's various transportation and transaction-based data collection systems. The *2022 ESPR* requires modeling and reporting on future forecast conditions, which the new spreadsheet-based volumetric model could not accomplish. Massport has returned to the previous VISSIM model, appropriately updated to reflect the on-Airport ground transportation and infrastructure changes that have occurred since 2017, the last time the model was used for this purpose. The VISSIM model is used to develop both existing and future VMT estimates.

3 PTV America. 2021. Verkehr In Städen Simulationsmodell – VISSIM version 2021 [computer software].

Table 6-1 Logan Airport Gateways: Annual Average Daily Traffic, 2011, 2017–2022

Year	AADT		AWDT		AWEDT		Annual Air Passengers	
	Volume	Percent Change	Volume	Percent Change	Volume	Percent Change	Level of Activity	Percent Change
2011	99,449	-	104,863	-	85,879	-	28,907,938	-
2017	124,646	-	130,601	-	109,723	-	38,412,419	-
2018	131,432	5.4%	137,105	5.0%	117,425	7.0%	40,941,925	6.6%
2019	137,331	4.5%	143,189	4.4%	122,678	4.5%	42,522,411	3.9%
2020	55,668	(59.5%)	57,210	(60.0%)	51,744	(57.8%)	12,618,128	(70.3%)
2021	88,238	58.5%	90,185	57.6%	83,371	61.1%	22,678,499	79.7%
2022	111,312	26.1%	114,690	27.2%	101,948	22.3%	36,090,716	59.1%
(2019-2022)		(18.9%)		(19.9%)		(16.9%)		(15.1%)

Source: Massport.
Notes: Numbers in parentheses ( ) indicate negative numbers. Gateway roadways include access to and from: Route 1A (including the Sumner and Callahan tunnels), I-90/Ted Williams Tunnel, Frankfort Street and Neptune Road, and Maverick Street. See Table 6-2 for the historical benchmark justification.
AADT Annual average daily traffic.
AWDT Annual average weekday daily traffic.
AWEDT Annual average weekend daily traffic.

6.2.2.1 Estimated VMT Calculations and Modeling Results

Consistent with previous years, the following specific time periods were analyzed for 2022:

- Morning peak hour
- Evening peak hour
- Highest consecutive 8-hour (High 8-Hour)
- Average weekday VMT

Table 6-2 summarizes the VMT estimates for Logan Airport-related traffic from 2011 and 2017 to 2022. Absent any major shift in traffic volumes entering the gateways, the change in VMT is expected to generally mirror the change in traffic volume. Following the trends identified above, the VMT increases seen between 2021 and 2022 were similar to the associated passenger activity level increases but were still below the 2019 VMT values. When compared to 2019, the average weekday VMT in 2022 was lower than 2019 by 21.6 percent, while AADT gateway volumes increased by 18.9 percent, suggesting trends are returning to more typical conditions as Airport operations and passenger behavior continue to normalize.

The decrease in VMT, when compared to passenger volume over the same time period, suggests passengers are returning to HOV modes in greater numbers. However, no direct correlations can be made at this time, as ground and passenger operations continue toward recovery to pre-pandemic conditions. Details of the 2022 VMT modeling results are presented in Appendix H, *Ground Access Supporting Documentation*.

Table 6-2 Airport Study Area Vehicle Miles Traveled (VMT) for Airport-Related Traffic, 2011, 2017-2022

Analysis Year[1]	AM Peak Hour	PM Peak Hour	High 8-Hour	Average Weekday	Average Weekday Percent Change
2011	8,391	10,978	76,920	167,647	-
2017	9,844	12,009	86,678	196,503	
2018	9,452	12,447	91,450	205,344	4.5%
2019	9,477	12,577	91,336	209,900	2.2%
2020	2,904	3,394	24,072	52,794	(74.8%)
2021	5,993	7,424	53,180	118,937	125.3%
2022	7,555	10,309	72,526	164,625	38.4%
Percent Change (2019-2022)	(20.3%)	(18.0%)	(20.6%)	(21.6%)	

Source: VHB and Massport.
Notes: Numbers in parentheses ( ) indicate negative numbers.
Data provided for 2011, 2017, and 2022 use the VISSIM model. Data from 2018 to 2021 used a spreadsheet based VMT model.
1 2011 is used as the historical benchmark for comparison because prior years only included the terminal roadways. The entire Airport campus roadway system was modeled starting in 2011, and thus would artificially show a substantially higher number than previous years due to the scope of modeling.

6.3 2022 Ground Transportation Ridership and Activity Levels

Many transportation service options are available to Logan Airport users from the Boston Metropolitan Area. This section highlights 2022 ridership levels and recent trends; Massport's progress in meeting its ground access goals; and Massport's cooperative planning with other transportation agencies in Massachusetts.

6.3.1 Logan Express, MBTA Transit, and Water Transportation Modes

Annual ridership levels for HOV, including transit, and shared-ride transportation modes serving Logan Airport are summarized in **Table 6-3**. A discussion of these services follows.

Table 6-3 Annual Ridership and Activity Levels on Logan Express, MBTA, and Water Transportation Services, 2011, 2017–2022

Year	MBTA Transit		Logan Express Bus			Water Transportation	
	Blue Line[1]	Silver Line[2]	Air Passengers	Employees	Total	MBTA Ferry[3]	Private Water Taxis[4]
2011	2,277,311	900,359	649,609	536,513	1,186,122	33,403	58,879
2017	2,197,783	N/A	1,140,235	695,504	1,835,736	7,424	83,689
2018	2,295,250	N/A	1,182,097	750,574	1,932,671	6,609	77,813
2019	1,635,147	N/A	1,381,700	824,084	2,205,784	7,467	61,071
2020	1,041,968	395,465	347,440	314,982	662,422	938	4,080
2021	1,361,036	512,872	514,702	266,062	780,764	1,760	19,363
2022	1,754,144	798,314	1,055,215	638,974	1,694,189	5,613	23,214
Percent Change (2019-2022)	7.3%	N/A	(23.6%)	(22.5%)	(23.2%)	(24.8%)	(62.0%)

Source: Massport.
Notes: Numbers in parentheses ( ) represent a decrease in annual ridership.
N/A Not available.
1 Airport Station fare gate entrances only.
2 Silver Line 1 boardings at Logan Airport. Fares have not been collected since June 6, 2012, but ridership estimates from automated counters available since 2020.
3 Boardings at Logan Airport. MBTA Ferry is the Harbor Express F2/F2H service, Hingham/Hull-Logan and Long Wharf.
4 Private water taxis include: Boston Water Bus and Boston Water Taxi

6.3.1.1 Logan Express Bus Service

Due to COVID-19, Massport temporarily suspended bus service to Logan Airport for air passengers and employees from suburban park-and-ride facilities in the towns of Peabody and Woburn, as well as the Back Bay Logan Express service. Logan Express also operated under reduced, hourly schedules for the Braintree and Framingham lines. In 2021, Massport improved **headways** to 30 minutes on the Braintree and Framingham lines and restored the Woburn Line at 30-minute headways. Massport restored the Peabody line service in February 2022 and Back Bay service in October 2022.

Bus customer facilities and secure parking are provided at the four suburban locations while no customer parking is provided at the Back Bay since this is an urban location. The cost of an adult Logan Express bus trips is $12 each way for a standard fare and $9 each way with advanced online ticket purchases. Back Bay Logan Express tickets are $3 to Logan, and free from Logan to Back Bay. Parking at suburban lots is $7 per day.

In 2022, all Logan Express services suspended during COVID-19 were restored.

Figure 6-3 depicts Logan Express bus locations with respect to the regional transportation network.

Due to reduced passenger demand, Logan Express passenger ridership from suburban park-and-ride locations decreased by 23.2 percent between 2019 and 2022 but now shows strong growth back towards pre-pandemic levels. A breakdown of Logan Express ridership is presented in Appendix H, *Ground Access Supporting Documentation*. **Table 6-3** compares 2019 and 2022 ridership on Logan Express.

Massport promotes Logan Express ridership through initiatives to reduce VMT, on-Airport traffic congestion, and air quality emissions. Massport is implementing the following at suburban locations:

- Increasing capacity for air passengers at Braintree Logan Express service in the short-term by relocating commuters to a new dedicated employee park and ride lot in nearby Quincy
- Improving frequencies on the Braintree, Framingham, Woburn, and Back Bay Logan Express services
- Adding approximately 1,000 additional spaces to the Framingham garage
- Enhancing marketing efforts to support the Logan Express strategy and increase ridership
- Investing in a new, larger facility in Danvers to temporarily relocate the Peabody Logan Express
- Identifying at least one new urban Logan Express location (North Station or similar location), and potential additional locations west of Boston
- Exploring RideApp Last Mile connections
- Continuing to monitor parking capacity across Logan Express sites

The Back Bay Logan Express restarted operations in October 2022 operating daily trips between the hours of 5:00 AM and 10:00 PM. Pre-pandemic enhancements that improved ridership from Back Bay include:

- Changed pick-up and drop-off location from Copley to Back Bay Station
- Provided discount one-way fare from $7.50 to $3.00, and free service from Logan Airport
- Piloted priority Airport passenger security line status for riders
- Implemented a marketing campaign to encourage increased ridership (ongoing)
- Implemented Logan Express electronic ticketing

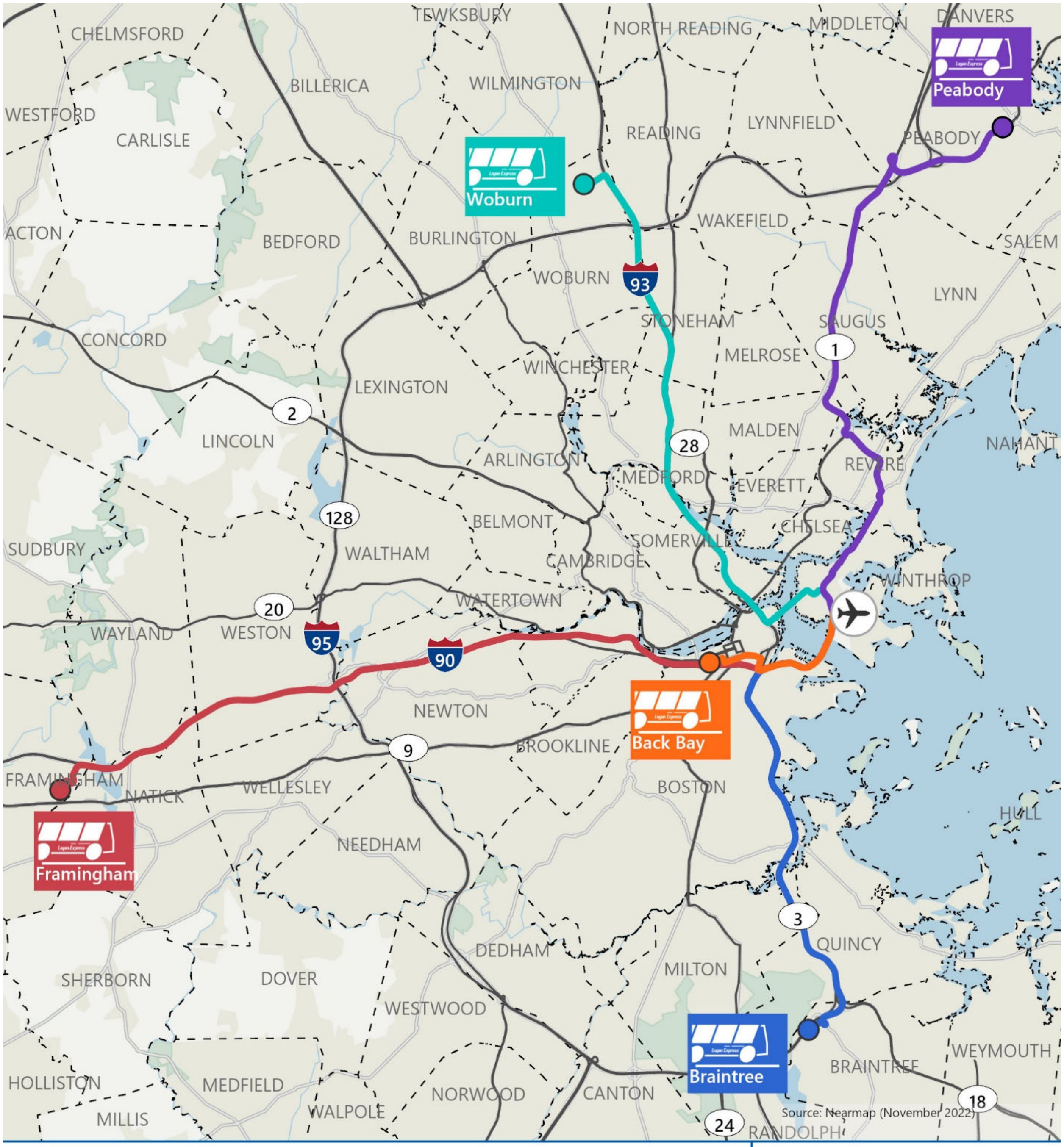


Figure 6-3 Logan Express Bus Locations and Routes

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6.3.1.2 Rapid Transit

Table 6-3, previously shown, compares 2019 and 2022 ridership on rapid transit to prior years. Passengers with trip origins in Boston, Cambridge, Brookline, and Somerville use MBTA public transit to travel to the Airport via the Blue Line or Silver Line 1. Both services are important for reducing automobile travel to the Airport; as the 2019 passenger survey results showed, over three-quarters of users of the Blue Line and Silver Line 1 indicated their alternative mode of travel to Logan Airport would have been a taxi or RideApp service, or they would have been dropped off at the Airport by private vehicle. **Figure 6-4** illustrates the public transportation options to access Logan Airport.

As noted in previous reports, MBTA Airport Station fare gate data do not distinguish between Airport-related riders and riders traveling to and from the neighborhood of East Boston, nor does it distinguish between Logan Airport air passengers and employees. Therefore, air passenger ridership levels on the Blue Line cannot be directly identified.[4]

Bus service on the Silver Line 1 from Logan Airport is free; transfers to the Red Line at South Station are also free, eliminating the need for fareboxes. Eliminating fare collection allows all three vehicle doors to be used for boarding, thus improving Logan Airport's curb operations, schedule adherence, and reducing idling. As a result of that change, passenger boarding data were no longer available. Starting in 2020, the MBTA was again able to provide Silver Line 1 boarding data.

6.3.1.3 Water Transportation

Table 6-3 compares water transportation 2022 ridership to prior years. Water transportation to Logan Airport's dock on Harborside Drive is provided from several locations: Long, Rowes, and Central Wharves in downtown Boston; the World Trade Center and the Moakley Courthouse in South Boston; and stops in the North End, Charlestown, Chelsea, and East Boston. A new stop opened in 2019 at Lovejoy Wharf near North Station. The MBTA Hingham/Hull ferry provides service to Long Wharf and destinations outside of the Inner Harbor, including Hingham and Hull.[5] Massport provides a free shuttle bus service between the Logan Airport dock, the MBTA Airport Station, and the Airport Terminals. These stops and routes are illustrated in **Figure 6-4**. Massport also provides its employees with a subsidy for water transportation modes. Currently, the one-way fare on the Hingham/Hull ferry to Logan Airport is $9.75 from Long Wharf and from Hingham/Hull.

4 Based on automated fare gate entrance counts, approximately 50 percent of entrances occur via the Bremen Street Park fare gates at Airport Station. Based on Massport curbside observations, approximately 45 percent of Airport Station entrances are attributable to Airport users.

5 The MBTA ferry from Hingham/Hull to the Logan Airport Ferry Dock runs less frequently and is less consistent than Blue Line and Silver Line services throughout the day. Frequencies between ferries range from one hour to several hours. There are 14 MBTA ferries to and from Logan Airport on weekdays; however, there are no MBTA ferries direct to Logan Airport from the South Shore during morning commuting times.

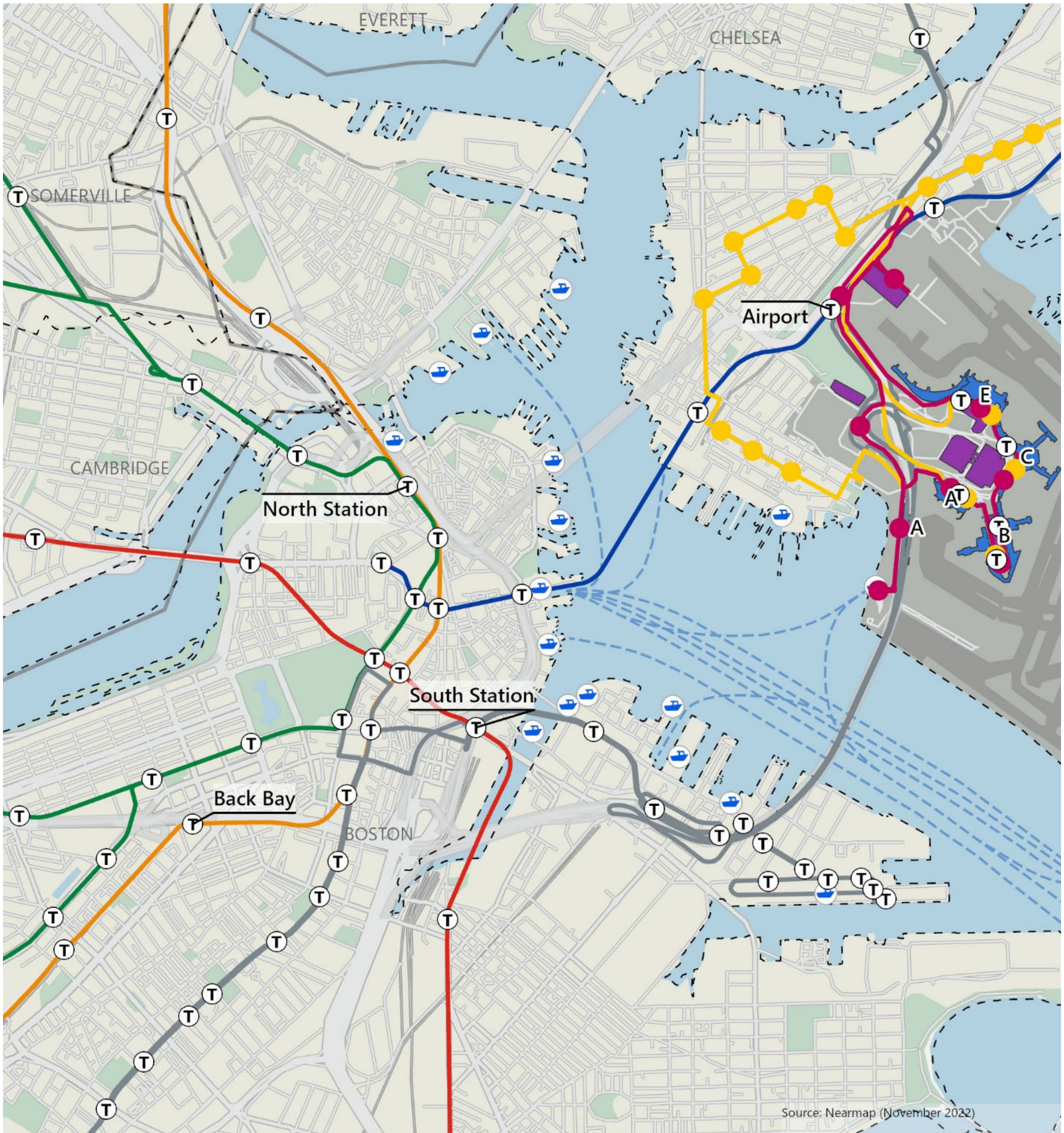

Figure 6-4 Public Transportation Options

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6.3.1.4 Other HOV Modes: Scheduled Buses, Shared-Ride Vans, Courtesy Vehicles, and Black Car Limousines

Massport provides priority, designated curb areas at all Airport Terminals to support the use of HOV, including privately operated scheduled buses, charter buses, and other passenger bus or van shuttles. The majority of scheduled shared-ride carriers use a combination of 15- to 40-passenger vehicles and 50+ passenger coach buses. Scheduled express bus service is offered by several privately operated carriers from outlying areas of the Boston metropolitan area and neighboring states. Courtesy vehicle services include routes between Logan Airport and many hotels in the Greater Boston area. Shared-ride vans also provide service from central and western Massachusetts and other regional points throughout New England.

As shown in **Table 6-4**, the estimated total number of seats provided by these HOV modes decreased by 31.7 percent in 2022 compared to the number of seats provided in 2019. The increased use of RideApp services over the past few years and the impact of COVID-19 have reduced the number of scheduled vans and black car limousines used for Airport transportation.

Table 6-4 Other Scheduled and Unscheduled HOV Modes: Scheduled Buses, Shared-Ride Vans, Courtesy Vehicles, and Black Car Limousines, 2011, 2017–2022

Year	Estimated Seats			
	Scheduled Buses	Scheduled Vans & Limousines	Courtesy Vehicles	Limousines (unscheduled)
2011	2,251,480	996,208	1,885,575	1,991,672
2017	2,969,395	385,221	3,057,645	2,528,057
2018	2,856,260	325,032	3,235,875	2,133,060
2019	2,752,970	297,631	3,125,865	1,953,236
2020	949,960	47,976	1,091,895	467,564
2021	2,094,730	34,648	1,418,745	705,904
2022	2,350,480	81,344	2,006,220	1,111,864
Percent Change (2019 – 2022)	(14.6%)	(72.7%)	(35.8%)	(43.1%)

Source: Massport.
Notes: Numbers in parentheses ( ) represent a decrease in annual seats.

6.3.2 Pedestrian Facilities and Bicycle Parking

Massport provides a substantial Airport-wide pedestrian network that links the Terminals to the neighboring community. Sidewalks along Harborside Drive and Hotel Drive connect to the Terminals, where a series of overhead, enclosed walkways provide pedestrian access to the Central and West Parking garages, as well as to and from the Hilton Hotel. The sidewalks along Harborside Drive, Transportation Way, North Service Road, and the Harborwalk facilitate pedestrian access to the Airport water transportation dock, MBTA Blue Line Airport Station, and the pedestrian and bicycle pathways at Memorial Stadium Park, Bremen Street Park, and the East Boston Greenway.

Bicycle parking racks are provided at many landside facilities. Generally, these racks are expected to primarily serve employees, but are open for use by air passengers as well. Currently, Terminal A, Terminal E, the Logan Office Center, Signature General Aviation Terminal, the Economy Parking Garage, the Green Bus Depot, and the Airport MBTA Blue Line Station have bicycle racks (covered bike parking is provided at Terminal A). The Rental Car Center has sheltered bicycle parking racks for use by both employees and passengers. Shower and changing facilities are provided at the Logan Office Center for Massport employees.

6.3.3 Non-HOV Modes

Logan Airport passengers also access the Airport by a number of automobile modes, including private automobiles, taxis, RideApp services, and rental cars. As of 2018, taxis, RideApp, and limousine services are classified as HOV or non-HOV for mode share purposes, depending on the number of passengers carried.

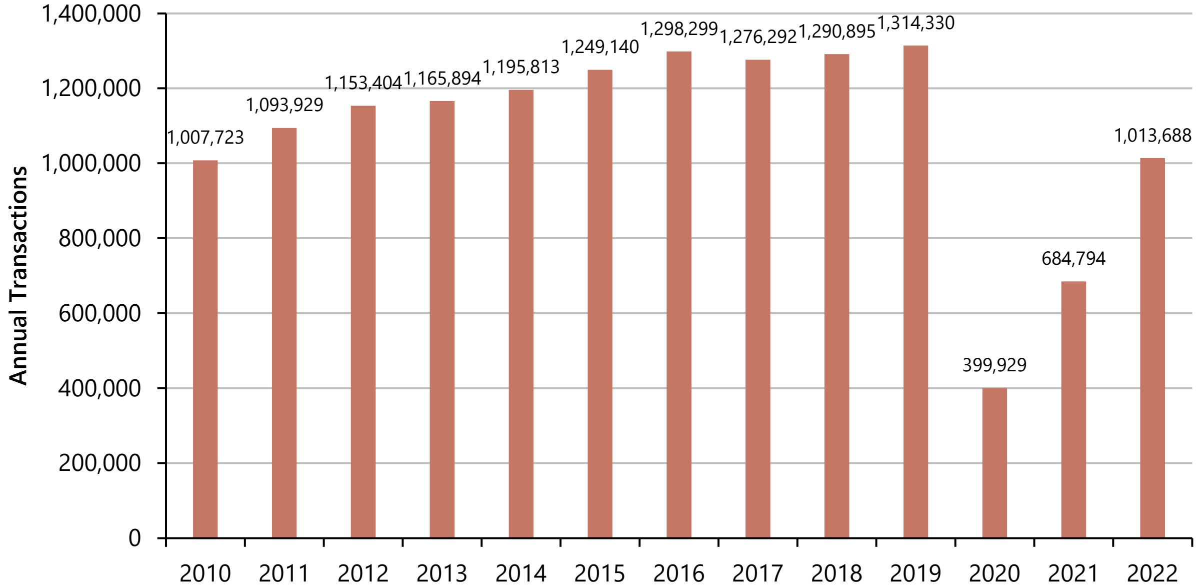
6.3.3.1 Automobile Access

Private automobile access to the Airport is classified as either curbside drop-off or parked on-Airport via the terminal area or remote economy parking areas. Volumes and VMT associated with these trips are described in Section 6.2.

6.3.3.2 Rental Cars

Eleven rental car brands served Logan Airport in 2022: Advantage, Alamo, Avis, Budget, Dollar, Enterprise, Hertz, National, Thrifty, Payless, and Firefly. Zipcar also provided services from the Rental Car Center. Due to the impact of COVID-19 on air travel, rental car transactions dropped significantly (see **Figure 6-5**). As of 2022, the number of transactions was 22.9 percent below 2019 pre-COVID levels.

Figure 6-5 Annual Rental Car Transactions at Logan Airport, 2010–2022



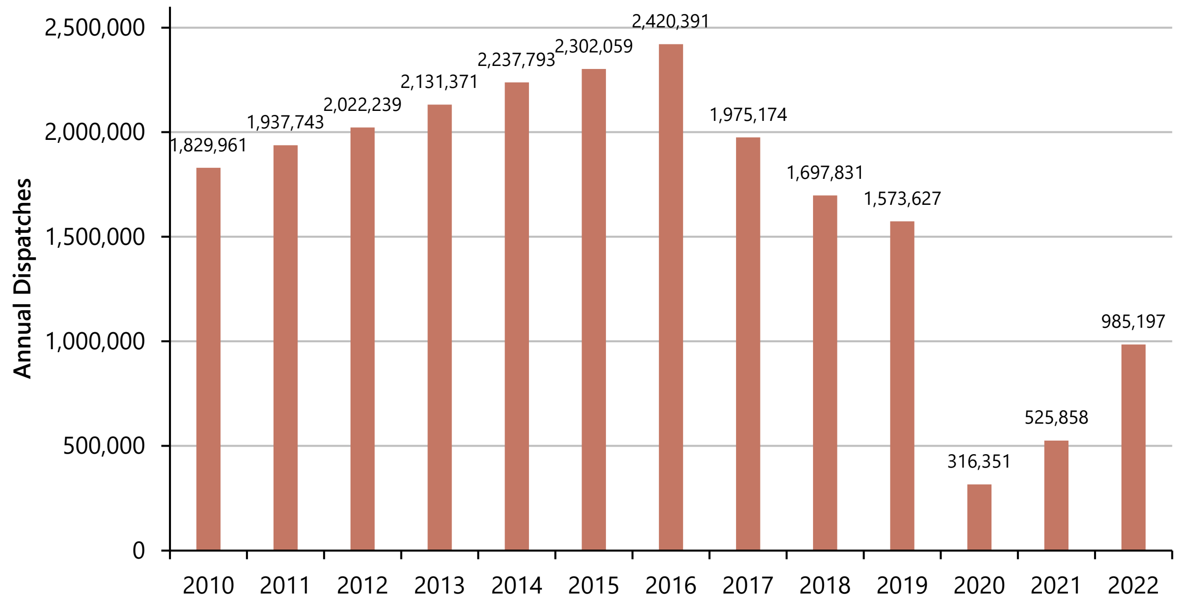
Source: Massport.

6.3.3.3 Taxis and RideApp Services

Taxi ridership trends were reflected in the total number of taxis dispatched from Logan Airport serving outbound passengers. The number of taxis dispatched has generally declined since 2016 (see **Figure 6-6**), which is primarily attributed to an increase in RideApp services at the Airport. COVID-19 further impacted taxi ridership. As of 2022, the number of taxi dispatches is now approximately 37.4 percent below pre-COVID levels.

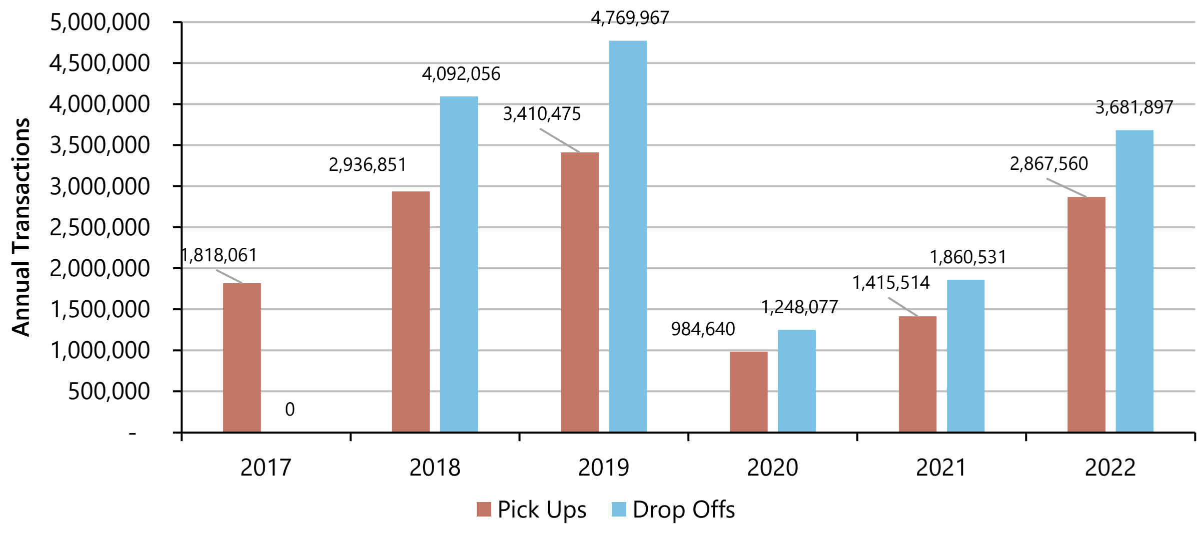
Figure 6-7 presents RideApp transaction data for 2017 through 2021. Prior to the pandemic, to address congestion issues caused by RideApp vehicles, Massport reconstructed the ground floor of the Central/West Parking Garage to facilitate passenger drop-off between 10:00 AM and midnight, and pick-up at all times. This service change was completed in December 2019. As with other for-hire modes, COVID-19 has impacted RideApp activity; 2022 activity levels were around 19.9 percent of the pre-COVID activity levels. RideApp operations serving Terminal B, including rematch, were moved from the Central Garage to the Terminal B Garage in November 2022.

Figure 6-6 Annual Taxi Dispatches at Logan Airport, 2010-2022



Source: Massport.

Figure 6-7 Annual RideApp Transactions at Logan Airport, 2017-2022



Source: Massport.

Notes:

1 Does not include January 2017.

2 RideApp drop-off was first authorized at Logan Airport in 2018.

6.4 2022 Parking Conditions

Massport manages the on-Airport parking supply at Logan Airport to promote long-term, rather than short-term parking to reduce the number of daily trips to Logan Airport; support efficient use of parking facilities; provide good customer service; and comply with the provisions of the Logan Airport Parking Freeze. Logan Airport offers multiple commercial parking facilities, including the Central/West Parking Garage, the Terminal B Garage, and the Economy Garage, which has free shuttle bus service to and from the Terminals 24 hours a day. Parking directly at Terminal E is provided on a short-term basis and requires a driver to remain with the vehicle. Details on 2022 parking conditions are presented in the following sections.

Massport has a comprehensive parking monitoring and management program that tracks on-Airport parking conditions, including parking facilities and supply, demand and parking rates, parking programs and preferred parking for hybrid and electric vehicle (EV) charging stations.

6.4.1 Logan Airport Parking Freeze and 2022 On-Airport Parking Availability

The number of commercial and employee parking spaces permitted at Logan Airport is regulated by the Logan Airport Parking Freeze (310 Code of Massachusetts Regulations 7.30), which is an element of the *Massachusetts State Implementation Plan* (SIP) under the Federal Clean Air Act (42 U.S.C. §7401 et seq. [1970]). As required, Massport submits semi-annual filings to the Massachusetts Department of Environmental Protection (MassDEP) demonstrating Massport's compliance with the Logan Airport Parking Freeze. The full reports for March and September 2022 are provided in Appendix H, *Ground Access Supporting Documentation*. Reports for March 2017 through March 2024 are available online here: (https://www.massport.com/massport/about-massport/project-environmental-filings/logan-airport/).

Total in-service commercial spaces are illustrated in **Figure 6-8**, along with the total number of parking spaces permitted on-Airport and the allocation of those spaces between commercial and employee spaces through 2022. Construction at the Airport and the shifting of total spaces among facilities account for the fluctuation of in-service spaces from year to year.

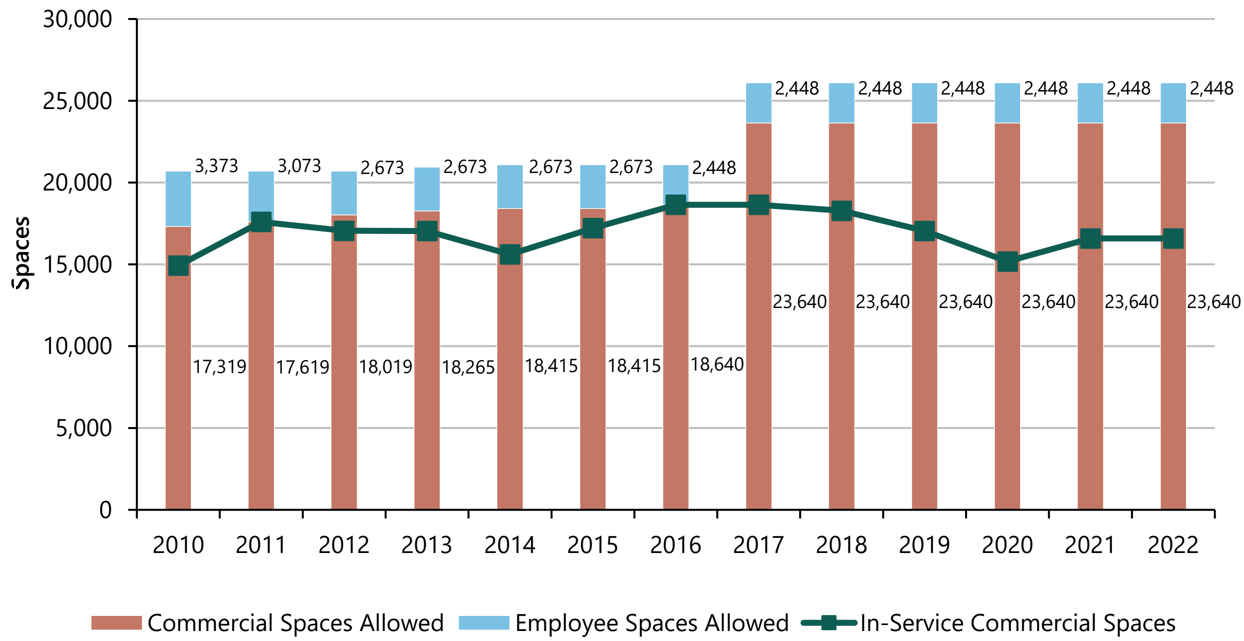
The Logan Airport Parking Freeze sets an upper limit on the supply of commercial and employee parking spaces at Logan Airport. The parking freeze limits were not exceeded in 2022. As permitted by the Parking Freeze provisions, over the past several years, Massport has converted employee spaces to commercial spaces within the overall limit imposed by the Logan Airport Parking Freeze. Massport has also transferred management of Airport-related park-and-fly spaces, previously part of the East Boston Parking Freeze,[6] to the Logan Airport Parking Freeze.

6 310 Code of Massachusetts Regulations 7.31.

The Logan Airport Parking Freeze limits were not exceeded in 2022.

Under the Logan Airport Parking Freeze regulation, Massport must monitor the number of commercial and employee vehicles parked on-Airport and verify the total number of parked commercial and employee vehicles does not exceed the Parking Freeze limits. If the number of commercially parked vehicles exceeds the allocated commercial parking limit under the Parking Freeze on any day, those additional vehicles are considered to be using "Restricted Use Parking Spaces." Use of Restricted Use Parking Spaces is allowed under the regulation when Logan Airport experiences "extreme peaks of air travel and corresponding demand for parking spaces" and may be made available for use only at such times, with a limit of up to ten days in any calendar year. These spaces must be provided free of charge when demand exceeds the limit.

Figure 6-8 Allocation of On-Airport Parking Spaces



Source: Massport.

Notes: Commercial spaces and employee spaces represent the number of parking spaces Massport is allowed to have under the Logan Airport Parking Freeze. In-service parking spaces are those currently available for users.

In 2011, 700 employee spaces were converted to commercial spaces under the Logan Airport Parking Freeze.

In July 2012 and June 2013, Massport acquired property in East Boston that reallocated 396 park-and-fly spaces from the East Boston Parking Freeze area to the Logan Airport Parking Freeze area.

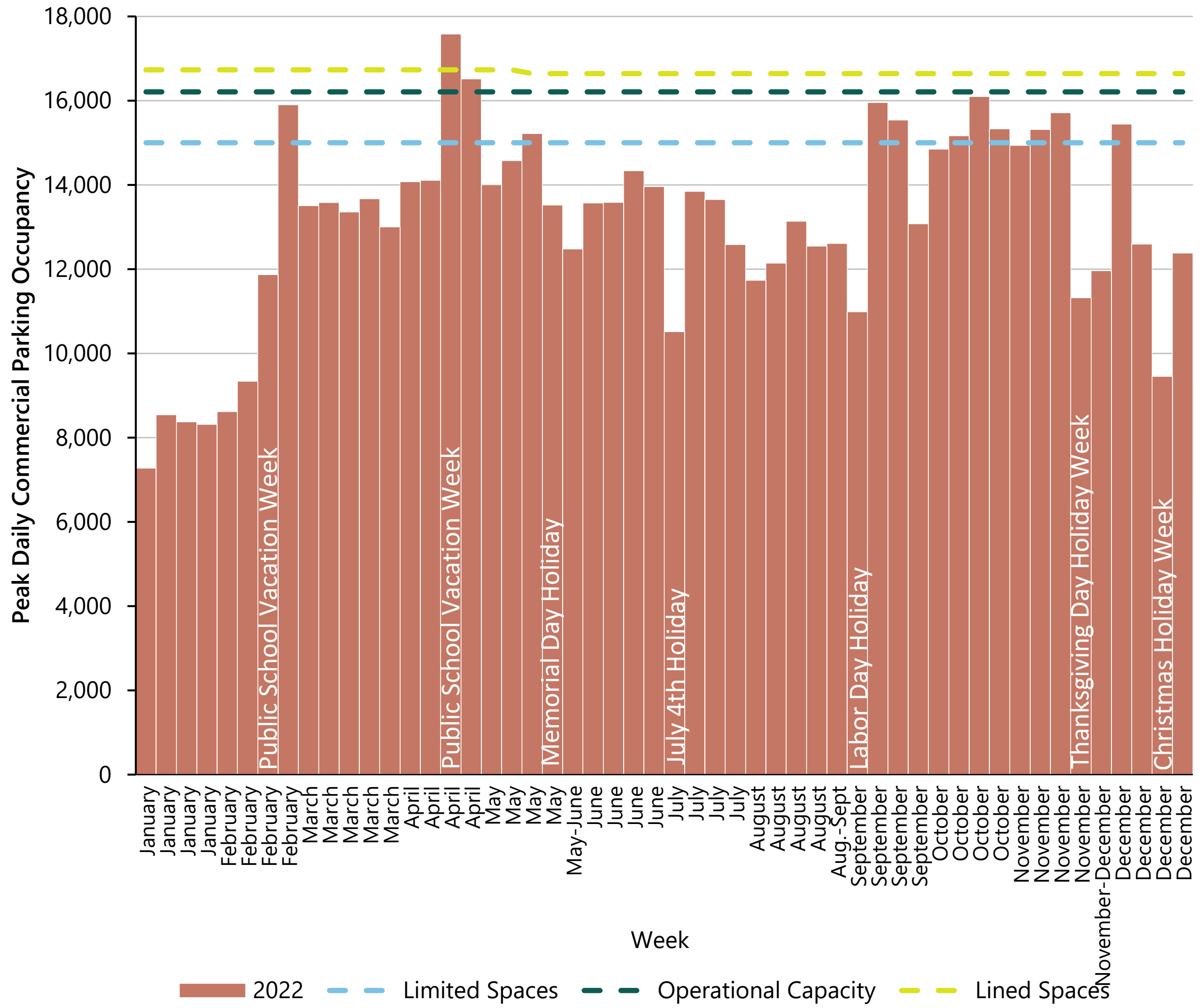
In 2016, Massport opened the West Garage Expansion, reallocating 225 employee spaces to commercial and increasing the total number of in-service commercial spaces.

In 2017, MassDEP approved an additional 5,000 parking spaces, which are included in the total Parking Freeze count but have not yet been constructed and are therefore not in service.

6.4.1.2 2022 Daily Parking Occupancy

On-Airport commercial parking occupancy historically peaks mid-week (Tuesday through Thursday) with lower occupancies occurring Friday through Monday. The number of vehicles parked at Logan Airport in commercial spaces over the course of any 24-hour period was obtained from parked vehicle count data for Tuesdays, Wednesdays, and Thursdays, which are collected throughout the year. The peak daily parking occupancy data for 2022 are presented in **Figure 6-9**.

Figure 6-9 Commercial Parking: Weekly Peak Daily Occupancy, 2022



Source: Massport.

Notes: The chart shows the highest daily count for each week in 2022.

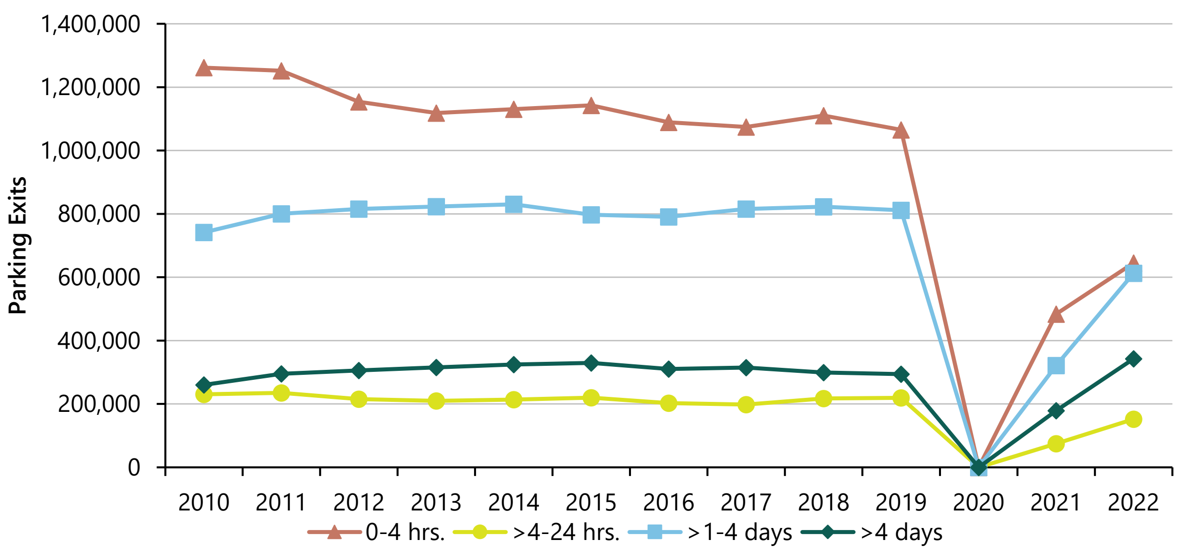
6.4.2 Operational Adjustments to Meet 2022 Parking Demand

Prior to the pandemic, constrained parking conditions were a regular occurrence at Logan Airport, requiring the diversion of vehicles to alternative or overflow parking and the need to employ valet parking operations. Inadequate supply of parking causes air passengers to circulate on Airport roadways to find parking. Parking diversion operations decrease operational efficiency and compromise customer service; as well as increase on-Airport VMT and emissions by generating additional on-Airport trips that would otherwise be unnecessary under uncongested conditions. The number of weeks in 2022 with high parking demand were still significantly fewer than prior to the pandemic. In 2022, Limited Space conditions, defined as peak commercial parking occupancy of between 15,000 and 16,210 vehicles were noted for twelve weeks. Operational capacity, defined as peak commercial parking occupancy between 16,210 and 18,100 vehicles was noted for two weeks and resulted in the deployment of valet parking operations over the course of four days in April, October, and November.

6.4.3 2022 Parking Exits by Duration

As presented in **Figure 6-10**, the total annual parking activity, as defined by revenue parking exits, dropped substantially during the pandemic. Overall, short-term parking has trended downwards since 2010 while other parking durations have remained relatively constant, despite unprecedented growth in air passengers. These general trends appear to be maintained in 2022 despite the substantially lower parking activity. Parking exits were 26.7 percent lower in 2022 compared to 2019.

Figure 6-10 Parking Exits by Length of Stay (Parking Duration)



Source: Massport.

Notes: Tickets are representative of revenue parking exits. Previous data reported in 2015 and 2016 have been adjusted down to account for the unintentional inclusion of non-revenue exits. Parking exit duration data for 2020 are not included due to data challenges related to a system software upgrade migration.

Table 6-5 On-Airport Commercial Parking Rates, 2019 versus 2022

Duration	Central Parking, Terminal B Garage, Terminal E Lot Rates		Economy Rates	
	2019	2022	2019	2022
0 minutes to 1 hour	$8	$8	$8	$8
1 to 2 hours	$21	$21	$20	$20
2 to 3 hours	$26	$26	$22	$22
3 to 4 hours	$30	$30	$25	$25
4 to 7 hours	$34	$34	N/A	N/A
7 to 24 hours	$38	$38	N/A	N/A
4 to 24 hours	N/A	N/A	$29	$29
Additional days 0 to 6 hours	$19	$19	$15	$15
Additional days 6 to 24 hours	$38	$38	$29	$29

Source: Massport.

6.4.4 2022 Commercial Parking Rates

Massport periodically assesses its parking rate structure to support its ground access strategy. As detailed in **Table 6-5**, parking rates in the on-Airport garages remained the same in 2022 as in 2019.

With a pay-on-foot system, Massport requires parking fees to be pre-paid at kiosks inside the Terminals and at garage access points at the pedestrian walkways, thus improving parking exit flow and reducing vehicle idling and associated emissions at exit plazas. Pay stations are located in the Terminals, at the Massport shuttle drop-off and pick-up location in the Economy Garage, and at the pedestrian entrances to the Central Garage, Terminal B Garage, and Terminal E Parking Lot.

6.4.5 Parking Programs and Initiatives

Massport has established the following programs and initiatives to support all Logan Airport users, including those arriving to pick-up travelers, those traveling to Logan Airport frequently, and those who are driving in environmentally friendly vehicles.

6.4.5.1 Cell Phone Waiting Lot

The Cell Phone Waiting Lot was moved in 2022 to be co-located with the RideApp Pool Lot on Porter Street. Before the creation of the Cell Phone Waiting Lot, drivers waiting for arriving passengers either used short-term parking, circulated around the Airport, or dwelled at the curb until asked to move. The Cell Phone Waiting Lot reduces vehicle emissions by minimizing idling and on-Airport VMT associated with private vehicle pick-up activity. Facility parking is free of charge, with a maximum wait time of 30 minutes. Users of the Cell Phone Waiting Lot are required to adhere to the State's no idling law.

6.4.5.2 Parking PASSport and Parking PASSport Gold

Parking PASSport allows users to enter and exit Logan Airport's parking garages and lots with an access card linked to an established account for convenience. Parking fees are automatically charged to a registered credit card and the receipt is emailed to the account holder. Customers in the Parking PASSport programs accounted for around 3 percent of parking exits at Logan Airport in 2022. Parking PASSport Gold enrollments declined substantially throughout the pandemic. Parking PASSport Gold eliminates the need for a motorist to circle the garage looking for available spaces by reserving 12 percent of spaces in the Central/West Garage and 38 percent of spaces in the Terminal B Garage for customers enrolled in the program. First implemented in 2006, the Parking PASSport Gold program subscribers have declined from 10,466 at the end of 2019 to 5,884 in December 2022.

6.4.5.3 Parking Reservations

In May 2021, Massport launched a new service that allows customers to make parking reservations in advance of arriving at the Airport. This service offers a limited number of parking spaces but allows the user to guarantee parking up to twelve months in advance. Parking cost is based on the lot chosen and duration of the customer's trip.

6.4.5.4 Hybrid and Alternative Fuel Vehicle (AFV) Parking

Massport provides more than 100 hybrid, EV, and **Alternative Fuel Vehicle (AFV)** only on-Airport parking spaces spread out among the Terminal and Economy Garage in preferred parking locations. Twenty-seven of these spaces provide EV charging locations convenient to the Terminals. While normal parking rates apply, there is currently no cost for electricity use. Real-time availability of spaces can be found on Massport's website (https://www.massport.com/logan-airport/getting-to-logan/parking). Currently, there more than 100 charging ports installed at Logan Airport and its Logan Express sites.

6.5 Ground Access Initiatives

Massport promotes ridership on HOV, including transit, and shared-ride modes and maintains efficient transportation access and parking options in and around Logan Airport to reduce the reliance on automobile modes as a means of achieving the HOV mode share goal. Measures implemented by Massport include a blend of strategies related to pricing, including incentives and disincentives, service availability, service quality, marketing, and traveler information. Because of the different demographics of Logan Airport air passengers, no single measure alone will accomplish the goal.

6.5.1 Future Passenger HOV Mode Share Goal

HOV mode share has reached 38.4 percent, exceeding Massport's near term goal of 35.5 percent.

In the *2017 ESPR*, Massport updated the definition of HOV to include increased knowledge and data from the rapidly changing transportation landscape since the emergence of RideApp services. Starting with the *2019 Logan International Airport Air Passenger Ground-Access Survey*, Massport has used this updated definition of HOV that considers vehicle occupancy among taxi, black car limousine, and RideApp modes. Previously, Massport counted taxis and RideApp services as non-HOV and black car limousines as HOV, regardless of the number of passengers transported. Under the updated definition, taxis, black car limousines, and RideApp services that carry two or more air passengers per vehicle are defined as HOV. With this new definition, Massport has a goal of reaching 35.5 percent HOV by 2022, and 40 percent HOV by 2027. Based on the results of the *2022 Logan International Airport Air Passenger Ground-Access Survey*, HOV mode share has reached 38.4 percent, exceeding the near-term goal.

6.5.2 Logan Airport 2022 Air Passenger Ground-Access Survey

Massport periodically[7] administers an extensive survey of air passengers to better understand the ground access characteristics of air passengers traveling to and from Logan Airport and to track historical trends of these attributes. Since the late 1970s, the *Logan Airport Air Passenger Ground-Access Survey* has been Massport's primary tool for understanding the changes in air passenger travel behavior, including ground access mode choices, travel patterns, and market characteristics. The survey is a tool that assists Massport in evaluating the effectiveness of its transportation policies and services, and the impacts on the regional transportation system. The survey also directs Massport's planning efforts to encourage Logan Airport travelers to use HOV and shared-ride modes instead of SOV modes.

The survey is the principal means of measuring air passenger ground access HOV mode share. **Table 6-6** presents the air passenger ground access mode shares from the 2022 survey findings. Progress toward the future air passenger mode share goal is measured using the *Air Passenger Ground-Access Survey*. The latest survey revealed an air passenger ground access mode share of 38.4 percent for HOV and shared-ride modes, using the definition of HOV presented in the previous section. The result confirms Logan Airport to be at the top of U.S. airports with respect to HOV and shared-ride mode share.[8]

RideApp services[9] (such as Uber™ and Lyft™) are now the predominant air passenger ground access mode to Logan Airport; this mode is used by 27.7 percent of travelers. Traveling in a private vehicle and being dropped-off at the Terminal Area is the second most common mode, at a 25.4 percent share. The

7 Since 2004, a passenger survey has been administered every three years.

8 There is no standard aviation industry definition with respect to categorizing ground access modes as HOV versus single occupancy vehicle (SOV). While some modes (e.g., Logan Express and the Silver Line) clearly fall into the HOV mode category, the appropriate category for a black car limousine or taxi is less clear.

9 RideApp services were not legally allowed to operate for arriving passengers in 2016.

combined mode shares for transit modes (including the MBTA's services, Logan Express, and similar scheduled bus services) is 15 percent of air passengers traveling to the Airport. Driving and parking at the Airport is the mode used by 8.6 percent of air passengers and taxis are now used by 2.8 percent.

Table 6-6 Air Passenger Ground Access Mode Share, 2022

Ground Access Mode	All Trips
Automobile Modes:	
Private Vehicle	
Dropped Off	25.4%
Parked On-Airport	7.4%
Parked Off-Airport	1.2%
Rental Vehicle	16.2%
Taxicab (1 occupant)	1.2%
RideApp (Uber™, Lyft™, and Fasten™) (1 occupant)	9.0%
Car Service (black car, private limousine, etc.) (1 occupant)	0.7%
Subtotal	61.6%
HOV and Shared Ride Modes:	
Public Transit	
Logan Express Bus	4.1%
Other Express Bus	3.7%
MBTA Blue Line Subway	1.0%
MBTA Silver Line 1 Bus	2.0%
Water Shuttle and Water Taxi	0.3%
Other Shared-Ride Vehicles	
Taxicab (2 or more occupants)	1.6%
RideApp (Uber™, Lyft™, and Fasten™) (2 or more occupants)	18.7%
Car Service (black car, private limousine, etc.) (2 or more occupants)	2.7%
Free Hotel and Courtesy Shuttle	2.5%
Charter Bus	0.5%
Subtotal	38.4%
Total	100.0%

Source: Spring 2022 Air Passenger Ground-Access Survey.

Table 6-7 Ground access Mode Share (All Passengers) by Survey Year

Ground access Mode	2010	2013	2016	2019	2022
Private Automobile	40.4%	43.2%	34.5%	32.1%	34.0%
Taxi	18.8%	18.6%	9.8%	3.9%	2.8%
Rental Car	10.9%	10.4%	10.9%	10.7%	16.2%
RideApps	N/A	N/A	14.3%	29.5%	27.7%
Unscheduled HOV	7.6%	8.3%	8.1%	7.8%	4.3%
Scheduled HOV	8.2%	6.9%	9.7%	8.4%	8.3%
Transit	7.6%	7.6%	6.6%	4.1%	3.3%
Courtesy Shuttle	4.6%	3.3%	3.3%	2.6%	2.5%
Other	1.8%	1.7%	2.6%	0.9%	1.9%
Total	100%	100%	100%	100%	100%

Source: Spring 2010, 2013, 2016, 2019, 2022 Air Passenger Ground-Access Surveys.
For this table, air passenger ground access modes are grouped into the following categories:
Private Automobile: Includes all passengers that are dropped-off by a privately-owned automobile, and all passengers who drive and park their vehicles at the Airport.
Taxi: A passenger driven to Logan Airport in a licensed, commercial taxi.
Rental Car: A passenger who rents a car from an on-Airport or nearby off-Airport rental car agency.
RideApps include services such as Uber™, Lyft™, and Fasten™ and are captured in the 2016 survey data for the first time.
Unscheduled HOV Service: Includes passengers who travel to Logan Airport via unscheduled limousine or van providers, depending on the number of passengers.
Scheduled HOV Service: A passenger who arrives at Logan Airport via scheduled bus, including privately-operated services and Massport's Logan Express.
Transit: A passenger who takes an MBTA public transit service (including the Blue Line subway, Silver Line 1 bus rapid transit) or one of the water transportation services (operated in conjunction with a dedicated Massport shuttle bus to and from Logan Airport Terminals).
Courtesy Shuttle: A passenger who arrives at the Airport in a courtesy shuttle, such as those offered by nearby hotels.
Other: Includes passengers that access the Airport by walking, riding a bicycle.

Table 6-7 presents the aggregated air passenger ground access mode shares for survey years 2010, 2013, 2016, 2019, and 2022. As the data indicate, the increased popularity of RideApp as a ground access mode is evident from the last two surveys. RideApp use more than doubled from 2016 to 2019. The RideApp mode share increased again in 2022, diverting mode shares from most other ground access modes, but primarily taxi, black car limousine, and unscheduled HOV.

It is important to note differences in survey administration that likely impacted 2022 results. The survey was extended multiple weeks in order to achieve the sample target – a challenge due in part to increased reluctance to participate in in-person surveys during the COVID-19 pandemic. As a result, the survey extended into peak local college and university graduation seasons resulting in a higher share of inbound visitor travel and, consequently, an unusually high rental car mode share. An MBTA Blue Line shutdown during a portion of the survey period likely resulted in a lower transit mode share than otherwise expected. An uneven restoration of certain services during the COVID-19 recovery, including fewer and less frequent bus services, also potentially impacted transit and scheduled HOV modes.

6.5.3 2022 Average Vehicle Occupancy (Air Passengers) by Ground Access Vehicle Modes

Table 6-8 presents the average vehicle occupancy and the percentage of passengers arriving in SOVs for each applicable mode. As expected, average vehicle occupancy is generally lower for the automobile modes, while the percentage of passengers arriving in SOVs is highest for these modes. Among the automobile modes, however, average vehicle occupancy is slightly higher for private vehicles than taxis and RideApp services, but lower than rental cars. Occupancy is highest for rental vehicles at 2.2 persons per respondent-trip. SOV trips are correspondingly lowest for rental vehicles, at around 15 percent of the total.

Table 6-8 Average Vehicle Occupancy for Selected Ground Access Modes: 2022

	Mode	Average Vehicle Occupancy	% Single Occupancy
Automobile	Private Vehicle	1.6	39.8%
	Rental Vehicle	2.2	14.7%
	Taxicab*	N/A	N/A
	RideApp Services	1.6	32.5%
HOV and Shared Ride	Other car service	2.0	19.7%
TOTAL		1.82	26.8%

Source: Massport 2022 Air Passenger Ground-Access Survey data
*The analysis excluded taxi data due to insufficient sample size

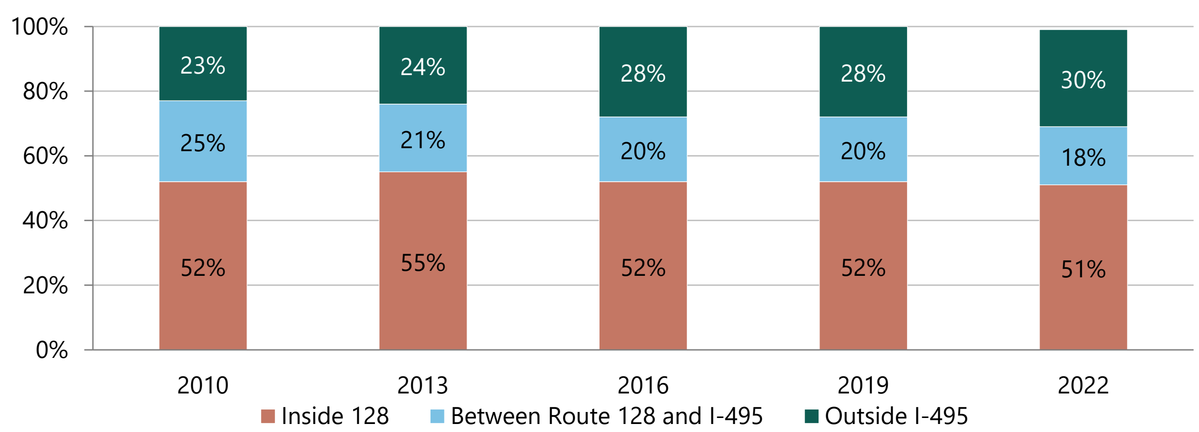
6.5.4 2022 Ground Access Origins of Air Passengers

Figure 6-11 indicates how the distribution of air passenger trips by geographic area has changed over time. The majority of trips still originate in Boston and other communities within Route 128. However, the *2022 Air Passenger Ground-Access Survey* suggests that the share of passengers originating from areas outside of I-495 has reached near parity to those originating within I-95 or Route 128.

The origin of an air passenger ground access trip has an important influence on mode choice. Simply stated, transportation systems and services vary by geographic area, and thus affect the availability and attributes of an air passenger's ground access options of a passenger traveling to Logan Airport. **Table 6-9** illustrates this point in which the distribution of ground access modes among passengers within four geographic areas is provided.

As expected, transit use is highest in the Urban Core (defined as Boston, Brookline, Cambridge, and Somerville) as this area is served by the MBTA's rapid transit system. RideApp and taxi use is also highest in this area (approximately half of all trips), due in part to the proximity to the Airport and the dense availability of these services. The area outside of the Urban Core but within Route 128 has minimal HOV, including transit, and shared-ride options; and automobile mode shares are highest for trips originating in this region. Outside of Route 128, scheduled express bus services provide the bulk of the HOV, including transit, and shared-ride services. Ridership growth in Logan Express and private buses have helped increase HOV and shared-ride services outside of Route 128 (but within Massachusetts) to near parity or better with the Urban Core. Due in large part to the prevalence of private scheduled bus options, overall HOV, including transit, and shared-ride mode use is highest among ground trips originating outside of Massachusetts. Otherwise, private vehicles are the dominant mode of access for passengers originating in areas outside of the Boston metropolitan area urban core.

Figure 6-11 Logan Airport Air Passenger Ground Access Trip Origins



Source: Spring 2010, 2013, 2016, 2019, 2022 Logan Airport Air Passenger Ground-Access Surveys.
Note: Based on air passengers departing on both weekdays and weekend days.

Table 6-9 Ground Access Mode Share by Air Passenger Ground Trip Origin, 2022

Ground Access Mode	Ground Trip Origin				
	Urban Core	Between Urban Core and Route 128	Between Route 128 and I-495	Outside I-495	Outside of MA
Dropped off	15%	33%	35%	31%	26%
Parked On-Airport	1%	5%	14%	12%	12%
Parked Off-Airport	0%	0%	3%	1%	3%
Rental Vehicle	10%	16%	13%	27%	25%
Taxi	5%	3%	2%	1%	1%
RideApp	54%	27%	14%	7%	3%
Car service (black car, private limousine, etc.)	1%	3%	5%	5%	5%
Logan Express Bus	1%	3%	9%	9%	3%
Other Express Bus	1%	0%	1%	4%	17%
MBTA Silver Line 1 Bus	5%	1%	0%	0%	0%
MBTA Blue Line Subway	2%	0%	0%	0%	0%
Water Shuttle and Water Taxi	0%	0%	0%	0%	1%
Free Hotel and Courtesy Shuttle	2%	6%	1%	1%	3%
Charter Bus	0%	0%	1%	1%	0%
Other	2%	2%	2%	2%	2%
Total	100%	100%	100%	100%	100%

Source: 2022 Logan Airport Air Passenger Ground-Access Survey. Totals may not add to 100% due to rounding.

6.5.5 2022 Market Segment: Trip Purpose and Residency

Massport characterizes air passengers into four distinct market segments:

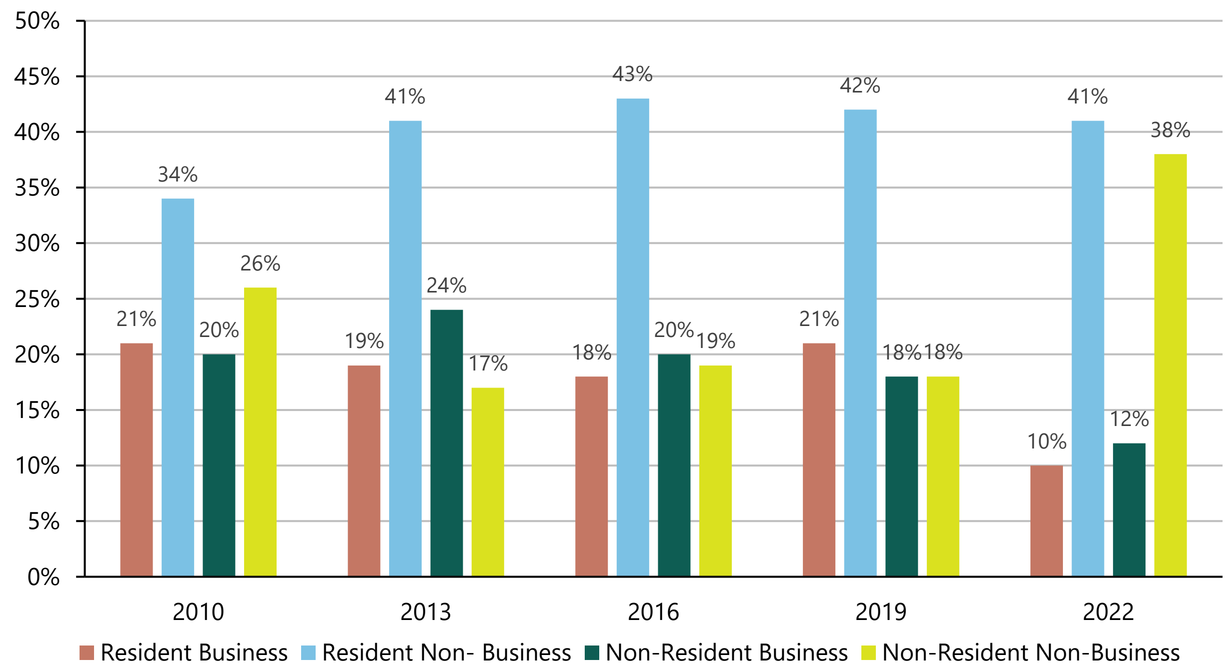
- **Resident Business:** passengers living within the region served by Logan Airport and traveling for business reasons;
- **Resident Non-Business:** passengers living within the region served by Logan Airport and conducting personal travel (e.g., leisure trips);
- **Non-Resident Business:** passengers living outside the region served by Logan Airport and traveling to conduct business; and
- **Non-Resident Non-Business:** passengers living outside the region served by Logan Airport and traveling for personal reasons (e.g., leisure or vacation travelers).

Residents are defined as passengers who use Logan Airport as their "home" airport, regardless of the proximity of the respondent's place of residence or work to other airports. It is important to study the passenger market in this manner because sensitivity to key factors that influence travel behavior such as convenience, time reliability, and pricing varies among these passenger market segments. This information assists Massport in developing appropriate ground access services for passengers.

Figure 6-12 compares the share of weekday trips by market segment across the five most recent surveys. The resident non-business market is the largest market segment, contributing over one-third of all air passengers at Logan Airport. The market share of leisure segments for non-residents had a noticeable increase in 2022 when compared to 2019.

Some of the growth in non-resident, non-business travel is attributable to the 2022 survey administration and, specifically, the survey period. Again, extending the survey period into May captured a peak travel season for inbound visitors due to local university and college graduations. While the overall data suggests an overall significant shift from business to non-business travel, the mix of resident and non-resident non-business travel, respectively, may have been different using the historical survey time period.

Figure 6-12 Weekday Market Segments (Combined Trip Purpose and Residency)[1]



Source: Spring 2010, 2013, 2016, 2019, 2022 Logan Airport Air Passenger Ground-Access Surveys.
Based on air passengers departing on weekdays only. Figures rounded.

There are numerous implications for ground access due to the changing mix of Logan Airport air passengers. **Table 6-10** and **Table 6-11** present ground access mode shares by market segment. HOV mode share is overall typically lower in the business market segments; business travelers typically have a high sensitivity to time, require flexibility and schedule reliability, and often make decisions related more to convenience than to cost (which is often covered by their employer and not by the passenger). Public transit and scheduled HOV services (including Logan Express) have a higher share among the non-business market segments, particularly for residents who have greater familiarity with the systems. Non-business market segments are more sensitive to ground transportation costs, travel less frequently but for longer time periods, and tend to travel at off-peak fly times and days. These factors help account for the increase in HOV and the relatively flat year-over-year changes observed in parking exits.

Table 6-10 Ground Access Mode Share by Market Segment, 2022

	Resident Business	Resident Non-business	Non-resident Business	Non-resident Non-business
Private Automobile	44.4%	50.6%	9.4%	20.3%
Taxi	4.1%	1.7%	6.4%	2.9%
Rental Car	1.3%	1.9%	26.6%	32.2%
RideApp	31.2%	21.7%	40.8%	30.1%
Unscheduled HOV/limousine	4.9%	4.5%	5.4%	1.2%
Public and Water Transit	2.2%	3.1%	1.6%	4.2%
Scheduled Bus	9.2%	13.3%	2.9%	3.9%
Courtesy shuttle	0.3%	1.8%	4.0%	3.2%
Other	2.5%	1.3%	2.9%	2.1%

Source: *Spring 2022 Air Passenger Ground-Access Survey*. Based on air passengers departing on both weekdays and weekend days. Rounded figures.

Table 6-11 Ground Access Mode Share by Market Segment (Recent Surveys)

Ground Access Mode	2010	2013	2016	2019	2022	2010	2013	2016	2019	2022
	Resident Business					Non-Resident Business				
Automobile Modes										
Private Automobile	59%	62%	48%	44%	44%	12%	14%	6%	5%	9%
Taxi	16%	17%	9%	3%	4%	36%	30%	21%	10%	6%
Rental Car	<1%	<1%	2%	1%	1%	27%	25%	29%	28%	27%

Table 6-11 Ground Access Mode Share by Market Segment (Recent Surveys)

Ground Access Mode	2010	2013	2016	2019	2022	2010	2013	2016	2019	2022
RideApp	-	-	14%	33%	31%	-	-	15%	40%	41%
Subtotal Auto Modes	**76%**	**80%**	**74%**	**81%**	**81%**	**75%**	**69%**	**72%**	**83%**	**63%**
HOV Modes										
Unscheduled HOV	10%	9%	12%	5%	6%	10%	12%	10%	4%	5%
Public and Water Transit	6%	6%	3%	3%	2%	3%	2%	4%	2%	2%
Scheduled Bus	4%	5%	8%	8%	9%	5%	9%	3%	2%	3%
Courtesy shuttle	2%	1%	<1%	<1%	<1%	5%	6%	7%	5%	4%
Other	1%	1%	2%	3%	3%	2%	2%	4%	4%	3%
Subtotal HOV Modes	**24%**	**20%**	**26%**	**19%**	**19%**	**25%**	**31%**	**28%**	**17%**	**11%**
	Resident Non-Business					**Non-Resident Non-Business**				
Automobile Modes										
Private Automobile	49%	55%	44%	42%	51%	36%	33%	29%	23%	20%
Taxi	13%	13%	5%	2%	2%	17%	18%	10%	4%	3%
Rental Car	2%	1%	2%	1%	2%	18%	20%	21%	24%	32%
RideApp	-	-	14%	25%	22%	-	-	15%	28%	30%
Subtotal Auto Modes	**63%**	**69%**	**65%**	**70%**	**76%**	**71%**	**71%**	**75%**	**79%**	**87%**
HOV Modes										
Unscheduled HOV	8%	9%	7%	7%	5%	4%	4%	5%	3%	1%
Public and Water Transit	12%	11%	9%	4%	3%	8%	6%	7%	6%	4%
Scheduled Bus	11%	7%	14%	13%	13%	9%	11%	7%	5%	4%
Courtesy shuttle	4%	2%	2%	2%	2%	6%	6%	5%	3%	3%
Other	2%	1%	2%	3%	1%	2%	2%	1%	4%	2%
Subtotal HOV Modes	**37%**	**30%**	**35%**	**30%**	**241%**	**29%**	**29%**	**25%**	**21%**	**13%**

Source: Spring 2010, 2013, 2016, 2019, 2022 Air Passenger Ground-Access Surveys.

6.5.6 RideApp Management Program

Massport officially commenced RideApp pick-up operations in February 2017. RideApps were directed to make pick-ups at locations previously used as small employee lots. As these locations were not designed to process thousands of daily RideApp pick-ups, growing RideApp activity resulted in long wait times for customers and vehicles backing onto terminal-area roadways, thus causing congestion and delays for customers. **Table 6-12** outlines the policies Massport has implemented to manage evolving RideApp operations and the status of each approach.

Table 6-12 Massport RideApp Management

Policy	Goal	Status
Rematch and Shared Ride	Implement RideApp rematch so drivers dropping off can more easily leave with a passenger.	Fully Implemented
	Implement changes such that RideApp passengers will be dropped off or picked up at new dedicated areas in the Central Garage through climate-controlled walkways to and from the Terminals, facilitating rematch and shared ride.	Fully Implemented
	Introduce RideApp shared ride incentives to reduce RideApp vehicles through gateways by increasing vehicle occupancies.	Fully Implemented
RideApp Fee Structure	Adopt new RideApp fee structure to support high-occupancy vehicle (HOV) strategies, encourage shared rides, and reduce gateway congestion.	Fully Implemented
Optimize RideApp Operations On-Airport	Introduce RideApp data reporting, new emerging RideApp products, new enforcement tools.	Ongoing

Source: Massport.

Due in part to continued growth in RideApp activity, and resulting congestion within and along roadways supporting the Central Garage, Massport relocated RideApp pick-ups and drop-offs for Terminal B to the Terminal B Garage. This initiative immediately relieved congestion with negligible change in rematch.

6.5.7 Long-Term Parking Management Plan

In addition to supporting HOV, Massport actively manages parking supply as another strategy to reduce drop-off and pick-up modes. Massport manages the on-Airport parking supply at Logan Airport to:

1. Promote long-term rather than short-term parking (thus reducing the number of daily trips to Logan Airport);
2. Support efficient utilization of parking facilities;
3. Provide good customer service; and
4. Comply with the provisions of the Logan Airport Parking Freeze.

Over time, Massport has reduced the number of on-Airport employee spaces from more than 5,000 to 2,448 spaces to further reduce VMT and promote sustainable transportation options. The 2019 analysis and findings of the *Logan Airport Parking Freeze Amendment Ground Access and Trip Reduction Strategy Studies* can be found on the Massport website: https://www.massport.com/sites/default/files/2023-10/final-massport-dep-report.pdf.

Table 6-13 describes each parking plan element that has been completed or is proposed for the near future, and Massport's progress to date. The *Long-Term Parking Management Plan* describes Massport's prior efforts as well as establishes what actions Massport will take, both now and in the future, to manage the supply, pricing, and operation of parking.

Table 6-13 Long-Term Parking Management Plan Elements and Progress

Parking Plan Element	Progress
Parking Supply:	
• Add revenue-controlled parking spaces in the terminal area to bring supply up to the maximum number of spaces allowed under the Logan Airport Parking Freeze.	• As allowed by the amended Parking Freeze and the Logan Airport Parking Project (through Massachusetts Environmental Policy Act [MEPA] permitting), Massport is permitted to add new commercial spaces in a new garage in front of Terminal E (see Chapter 4, *Airport Planning*, Table 4-2).
• Work to increase the supply of Massport-controlled, off-Airport parking at Logan Express sites.	• Massport is adding approximately 1,000 additional spaces to the parking garage at the Framingham Logan Express site.
Parking Pricing:	
• Discourage air passengers from driving and parking at Logan Airport by ensuring that the Massport-controlled parking provided at remote Logan Express sites is the least expensive.	• Massport has reduced parking rates at Logan Express facilities from $11.00 per day to $7.00 per day. The least expensive drive-up parking rate at Logan Airport is $32.00 per day.

Table 6-13 Long-Term Parking Management Plan Elements and Progress

Parking Plan Element	Progress
Parking Pricing (*continued*):	
• Encourage more efficient use of available on-Airport parking by maintaining a meaningful price differential between rates at the Economy Parking Garage and terminal-area parking garages.	• Economy Parking was raised to $32.00 per day; terminal-area garage and lot rates are $41.00 per day.
• Evaluate increased parking prices for terminal-area parking to encourage Airport passengers and visitors to consider transit and shared-ride alternatives.	• Parking pricing review is continuous.
Parking Demand:	
• Increase the frequency and availability of alternative high-occupancy vehicle (HOV) mode options to decrease use of private vehicles.	• Massport continues to evaluate opportunities to improve Logan Express service and ridership (specific details are provided elsewhere in this chapter). • Massport offers various promotional bus discount fares at Logan Express. • Massport placed signage in all Terminals to help promote the use of the regional express bus carriers. • Massport continues to sponsor free outbound (from Logan Airport) Silver Line bus service and Back Bay Logan Express service. • Massport continues to work with private carriers to provide HOV options to and from Logan Airport.
Employee Parking:	
• Continue to work to reduce the number of Airport employees commuting by private automobile and parking at the Airport by providing off-Airport parking both near Logan Airport and at Logan Express sites and implementing measures to enhance employee commuting options.	• Massport provides employee parking in Chelsea with free shuttle bus transportation to the Airport. Due to the pandemic, the Chelsea Garage was closed during initial phases of the pandemic but reopened in 2022. • Massport offers reduced employee rates to encourage the use of Logan Express facilities. • Additional early morning and late-night bus service has been added to Logan Express sites to encourage use and better serve Logan Airport employee schedules. Massport supports the Sunrise Shuttle, which provides early morning bus service for employees from East Boston and parts of Winthrop and Revere prior to the start of MBTA service.

Source: Massport.

6.5.8 Employee Ground Transportation Initiatives

Airport employee ground access needs are different from passenger transportation needs. Airport employees often have non-traditional, and sometimes unpredictable, working hours that are difficult to match to typical MBTA transit service hours of 5:00 AM to 1:00 AM. Due to the time-sensitive nature of airline operations, on-time reliability is important for employee transportation, as is flexibility during severe weather or other delays that may extend a typical employee workday or work shift.

Massport strives to reduce the number of Airport employees commuting by automobile, enhance commuter options, and reduce traffic and parking demands at Logan Airport. To help accomplish these objectives, Massport continues to:

- Provide off-Airport employee parking in Chelsea, which is served by frequent free shuttle bus service to the Terminals (Route 77) 24 hours a day, seven days a week.
- Run free employee shuttle buses between Airport Station and employment areas in the Southwest Service Area and the South Cargo Area locations (Routes 44, 66, and Logan Office Center).
- Run free shuttle buses between Airport Station and Terminals (Routes 22, 33, 55 and 88).
- Operate early morning and late-night Logan Express bus trips for Airport employees.
- Support the Sunrise Shuttle for early morning bus service from East Boston, Winthrop, and Revere prior to the start of MBTA service.
- Expand and maintain a comprehensive sidewalk and walkway system at Logan Airport to facilitate pedestrian access.
- Provide Massport employee subsidies for water transportation and transit use.
- Provide bicycle racks.[10]
- Advise Airport employers on transit benefits, including transit subsidies, and provide information on available commuting alternatives, ride-matching services, and reduced-rate HOV and transit fare options.
- Consistent with Logan Airport transportation management goals, Massport provides financial support for the Sunrise Shuttle and other benefits noted above.

10 Bicycle racks are provided at terminals, Logan Office Center, MBTA's Airport Station, Economy Parking Garage (covered), Signature general aviation terminal, the Green Bus Depot (Bus Maintenance Facility), and the Rental Car Center (covered).

6.6 Ground Access in the Future Planning Horizon

Logan Airport is anticipated to reach 53.5 MAP in the next 10 to 15 years (the Future Planning Horizon). While the sections above discuss strains placed on the Airport's roadway infrastructure at 2022 levels (36.0 million passengers) and the current trends observed on Airport roadways, the sections below discuss the policies and infrastructure changes Massport is considering to enhance on-Airport traffic flow and ground access operations. The importance of alleviating congestion is twofold: it allows for continued safe and efficient operation of the Airport's landside operations and it is necessary to reduce environmental impacts. Enhancing multimodal transportation options and providing modern, flexible infrastructure is one way an airport can reduce GHG emissions and improve its environmental footprint.

Potential emissions reductions are one reason Massport is committed to a long-term goal to promote and support public and private HOV and shared-ride services aimed at serving air passengers, Airport users, and employees. Other benefits include:

- Improving operations on the terminal-area roadways and at curbside drop-off and pick-up areas;
- Alleviating constraints on parking facilities; and
- Improving customer service (providing a range of transportation options for different travelers).

The following analysis assumes these measures will be implemented by Massport over the next decade. Specifics of the measures themselves are currently under development and will be further documented in subsequent environmental filings and EDRs/ESPRs.

6.6.1 Future Planning Horizon VMT Estimate

The VMT analysis of the Future Planning Horizon is based on a forecasted increase in air passenger activity, associated increases in cargo, and planned policy changes that are anticipated over the next 10 to 15 years. The passenger level evaluated represents an increase of approximately 17.5 million air passengers over 2022, 90 percent of whom start or end their trip at Logan Airport and are expected to use ground transportation to and from the Airport (the remaining 10 percent are air passengers are expected to have connecting flights through Logan Airport and would not use ground transportation services).

The future forecast peak summer, average day passenger forecast described in Chapter 3*, Activity Levels and Forecasting,* was used as the basis for the VMT and parking estimates. Hourly passenger forecasts at terminal gates were translated to reflect the time the passenger would arrive or depart the terminal curbside. Once the hourly curbside passengers were calculated, they were converted into the appropriate vehicle trip and route based on estimates of future mode share and average vehicle occupancy for different vehicle types (passenger cars, RideApp, taxis, etc.).

Massport has a standing policy to maintain ground access operations and improve roadway function to accommodate passengers arriving and departing the Airport. This policy has resulted in a robust HOV program, and several infrastructure and operational modifications that complement broader policy changes that allow terminal-area roadways and curbsides to continue functioning adequately and minimize vehicle idling and associated emissions. Some modifications, such as the Terminal B/C Roadway project, the Terminal C Curbside Optimization, and changes to Terminal B curbsides and RideApp operations are already complete. These modifications appear to have a lasting benefit on future airport ground access conditions and are projected to reduce terminal roadway congestion through future forecast peak summer, average day forecast levels.

A VMT analysis was conducted for the Future Planning Horizon using the VISSIM model of Logan Airport. As noted above, on-Airport vehicle trips were estimated based on available flight forecast information and anticipated mode shares. Mode share development was based on the following policy changes anticipated to be in place over the next decade:

- Substantial capital investment to increase parking capacity at major Logan Express sites;
- Improved frequencies on the Braintree, Framingham, Woburn, and Back Bay Logan Express services;
- At least one new urban Logan Express location (North Station or similar location), and potential additional locations west of Boston;
- Reduced Logan Express pricing in urban areas and other service enhancements for all passengers who use Logan Express;
- Prioritization of transit on Logan Airport roadways, ensuring optimized bus flow;
- Continued investment in and expansion of the Silver Line 1 bus service to meet demand;
- Ongoing and future improvements to Blue Line access to Logan Airport, including direct service to Terminals and future investments in better integration of Airport Station to Terminal E; and
- Continued partnership with private bus companies to support multi-state and regional transit access to Logan Airport.

Other infrastructure modifications implemented in the next 10 to 15 years may include:

- Construction of a new parking garage near Terminal E;
- Reconstruction of the terminal area roadways between Terminals C and E (arrivals and departures);
- RideApp Lot relocations, pick-up and drop-off modifications, and routing changes;
- Terminal A curbside optimization;
- Some combination of these improvements.

Additionally, roadway improvements currently underway, including the Terminal B Curbside Optimization and intersection modifications along Transportation Way and Harborside Drive have also been assumed.

In the Future Planning Horizon, daily on-Airport VMT is estimated to be 212,022, which is 1 percent more than the 2019 daily VMT of 209,900 and 29 percent more than the 2022 daily VMT of 164,625. The increase in VMT is primarily attributed to forecast increase in air passenger activity.

6.6.2 Future Parking Demand

Prior to the pandemic, on-Airport roadway diversions between on-Airport locations, in addition to valet operations, were regular occurrences. Inadequate supply of parking causes air passengers to circulate on Airport roadways to find parking. These diversions decrease operational efficiency and compromise customer service; as well as increase on-Airport VMT and emissions by generating additional on-Airport trips that would otherwise be unnecessary under less congested conditions. While the number of weeks of high demand for parking in 2022 is still significantly lower than pre-pandemic conditions, Massport continues to actively manage its current parking operation and supply as well as future parking plan through the *Long-Term Parking Management Plan*, as described in Section 6.6.7.

The 2017 Parking Freeze amendment and the Logan Airport Parking Project facilitate the addition of up to 5,000 new commercial parking spaces, which will increase the parking supply and allow drive-and-park to become a more reliable mode choice to the Airport, reducing on- and off-Airport VMT by reducing the number of passengers dropped-off or picked-up at the Airport. See Chapter 4, *Airport Planning*, Section 4.2 for further details on this project. Construction of new parking facilities to achieve the total permitted under Parking Freeze would:

- Shift "would-be parkers" from drop-off and pick-up modes to parking;
- Reduce the number of trips associated with "would-be parkers" traveling to and from Logan Airport;
- Improve on-Airport roadway and terminal curbside congestion associated with drop-off and pick-up activity;
- Reduce air quality effects associated with drop-off and pick-up activity by increasing the parking supply and decreasing the number of passengers choosing drop-off and pick-up modes; and
- Enhance passenger experience by reducing the need to divert parkers to off-Airport satellite parking locations, which increases the time it takes for air passengers to drop-off their cars and access the terminal area and leads to additional VMT per vehicle.

In 2022, it was estimated that roughly 9,800 vehicles entered or exited Massport's parking system on a peak summer average day. This includes all short- and long-term parkers. In the future forecast, this number is anticipated to increase by 65 percent to 16,300 vehicles. However, this estimate does not consider how parking might change on-Airport given the factors discussed above, including parking capacity. Massport will continue to analyze future parking demand and increased passenger activity levels in the context of changes in parking supply, on-Airport access, and new technology such as electric and autonomous vehicles.

6.6.3 Ground Access Goals

Table 6-14 lists each ground access goal and updates on Massport's initiatives associated with each goal. Initiatives are planned, designed, implemented, and continuously refined to account for the changing national, regional, and local conditions that affect Logan Airport and its users.

Table 6-14 Ground Access Planning Goals and Progress (2022)

Goal	2022 Update
Increase air passenger ground access high-occupancy vehicle (HOV) mode share to 40 percent by 2027	• Massport continues to provide and actively promote numerous HOV and shared-ride options, including Logan Express bus service, Silver Line 1, water shuttle services, and frequen free shuttle bus service to and from the Massachusetts Bay Transportation Authority (MBTA) Blue Line Airport Station. Massport has a goal of reaching 35.5 percent HOV by 2022 and 40 percent by 2027. The *2022 Air Passenger Survey* indicates HOV mode share has reached 38.4 percent. • Massport continues its partnership with the MBTA to offer free Silver Line boardings at the Airport. The reduced dwell times and faster travel times through the terminal area led Massport to extend the free-fare program indefinitely. The MBTA operates ten Silver Line buses purchased by Massport in 2023 with Massport paying operating costs for portions of the Silver Line service directly servicing Airport Terminals • Massport restored Back Bay Logan Express Service in October 2022. • Massport is also increasing Logan Express capacity and frequencies for the on the Braintree, Framingham, Woburn, and Back Bay Logan Express services.
Reduce employee reliance on commuting alone by private automobile	• Massport continues to support the Sunrise Shuttle, which provides fixed-schedule service to employees in East Boston, Winthrop, and Revere who have shifts commencing outside of MBTA service hours. Massport continues to provide outreach to employees about commute options. • For employees who reside in neighborhoods and communities closer to the Airport, bicycle parking options have increased with bicycle racks offered at all Terminals, the Economy Garage, the Green Bus Depot, the Rental Car Center, the Logan Office Center, and the Signature general aviation terminal. Massport is also investigating ways to improve safer bicycle access to and around Logan Airport facilities.
Improve roadway function related to increasing use of RideApps	• In November 2022, Massport relocated Terminal B RideApp services to the Terminal B garage. Massport is also considering relocating Terminal E RideApp services to the future Terminal E garage.
Increase the overall efficiency of the MBTA through interagency coordination	• Massport participates in the Boston Metropolitan Planning Organization (MPO) to promote planning and funding of transportation system options that enhance access to the Airport. Massport and the MBTA have worked together on several initiatives including the renovated Blue Line Airport Station and the Silver Line bus service to Logan Airport. Massport has also partnered with the MBTA, the Massachusetts Department of Transportation (MassDOT), the City of Boston, and the Convention Center Authority in implementing transportation improvement plans recommended in the South Boston Waterfront, including sustainable transportation plans, as a means to improve the MBTA Silver Line access between South Station, the South Boston Waterfront, and the Airport.
Improve management of on-Airport ground access and infrastructure through technology	• Massport disseminates ground access and parking information through the Internet (www.massport.com), social media (Twitter and Facebook), a toll-free telephone number (1-800-23-LOGAN), Smartraveler, and in-Airport kiosks. Massport's redesigned website has an interactive tool that helps users access Logan Airport, while providing multimodal options.

Source: Massport.

7. Noise

This chapter describes the 2022 noise levels associated with **aircraft operations** at and in the vicinity of Boston Logan International Airport (Logan Airport) and discusses efforts to reduce airport noise. Noise levels are determined using detailed flight information including aircraft and engine types, movements on the ground, **landing and takeoff (LTO)** activity, and aircraft arrival and departure routes. Using the Federal Aviation Administration (FAA)-required noise model, the **Aviation Environmental Design Tool (AEDT version 3e)**, a years' worth of flight and aircraft information is used to determine annual noise levels surrounding the airport.

Noise levels are calculated using the **Day Night Average Sound Level (DNL)** metric and presented as a series of contours of equal sound levels that are measured in **decibels (dB)**. This *2022 Environmental Status and Planning Report* (ESPR) presents annual **noise contours** in 5 dB intervals between 60-75 dB, and also calculates the population within those areas. FAA currently considers DNL 65 **"A"-weighted decibel (dBA)** as "the threshold of significant noise exposure" and therefore much of the noise discussion in this chapter focuses on the DNL 65 contour and populations within that contour. The FAA noise model acknowledges that nighttime noise can be more impactful than daytime noise; to adjust for quieter nighttime background noise, the model multiplies the noise of each individual nighttime operation (between 10 PM and 6 AM) by a factor of ten. Details on noise model inputs, noise calculations, and the federal regulatory framework are summarized in this chapter and Appendix I, *Noise Supporting Documentation*.

The Logan Airport modeled 2022 noise conditions of aircraft operations and compared the findings to those for 2019, 2021, and selected prior years for context, which are presented in this chapter. In 2022, annual flight operations increased compared to 2021, but remained below the number of pre-pandemic flight operations in 2019. The 2022 aircraft fleet continues to change as airlines accelerate the retirement of older, noisier, and less efficient aircraft models and some smaller regional jets (RJs). These fleet changes help by reducing the number of noisier aircraft operating at Logan Airport.

As part of the ESPR process, this chapter also reports on projected future noise conditions in the 10 to 15 year timeframe. The modeled **Future Planning Horizon** represents a planning scenario serving a projected 53.5 million annual passengers (MAP). The associated forecast for the number of future aircraft operations, assumptions of runway use, and future flight tracks form the basis of the projected future noise environment. The forecast scenario estimates approximately 495,000 total annual operations, which remains below the historical peak reached in 1998. The projected future fleet of aircraft types accounts for some retirement of older aircraft but does not incorporate future aircraft and engine types that are not yet operational or included in the federal noise model. Thus, the noise predictions are conservative in that the future fleet is quieter than calculated for this ESPR due to technological improvements.

Massport implements one of the longest-standing and most extensive noise abatement programs of any airport in the nation, including the earliest **Residential Sound Insulation Program** (RSIP).

Acknowledging that aircraft noise is one of the most significant airport community impacts, for over 40 years Massport has made extensive efforts to minimize the noise effects of Logan Airport operations on its neighbors through a variety of noise abatement programs, procedures, studies, and other tools. The elements and goals of Massport's overall Noise Abatement Management Plan are summarized in the last section of this chapter, along with highlights of Massport's activities and achievements in 2022 as part of its long-standing noise abatement program. Of particular note is Massport's recent success in working with FAA to restart Logan Airport's RSIP,[1] which included beginning to reevaluate the effectiveness of previously installed first-generation sound insulation windows and to provide upgrades under the RSIP.

Noise Key Findings for 2022

The following details key findings on the noise environment at the Airport in 2022:

- At Logan Airport, annual aircraft operations in 2022 totaled 378,613; approximately 11 percent below the pre-pandemic level in 2019 and 42 percent above the 2021 total.
- The 2022 DNL contours are similar in shape to the 2019 DNL contours but reduced in size. The smaller 2022 DNL contours (in comparison to the 2019 DNL contours) is primarily a result of fewer aircraft operations as well as changes in aircraft fleet mix, with the phasing out of some noisier, less-efficient aircraft that were in the 2019 aircraft fleet.
- The 2022 Logan Airport aircraft fleet mix was composed of aircraft types with newer and quieter engine technology, and approximately 99 percent of 2022 operations were conducted by aircraft meeting either Stage 5 (quietest) or Stage 4 (next quietest) FAA certification requirements. Only one percent of operations were conducted by aircraft with Stage 3 certification, not meeting the higher standards. In comparison, those noisier aircraft represented 2 to 3 percent of aircraft operations in 2019.

1 See Section 7.8.1 Residential Sound Insulation Program (RSIP) for more information.

- The number of people residing within the modeled 2022 DNL 65 dB contour (8,185 people) was 7 percent below the 2019 level (8,665 people). The population within the 2022 DNL 65 dB contour is located in Revere, Winthrop (Point Shirley), Chelsea and Boston (Orient Heights).
- Nighttime aircraft operations represented approximately 14 percent of total operations, and among these nighttime operation events, 83 percent occurred either before midnight or after 5:00 AM. The 143.5 average total nighttime flights (commercial and cargo) are less than the 2019 average of 194.6 nighttime flights but greater than the 75.7 average nightly flights of 2021.
- As part of the **Noise and Operations Monitoring System (NOMS)** upgrade completed in 2022, Massport replaced 29 of 30 monitors in the permanent noise monitoring system. The final monitor was installed in April 2023 at a newly identified location to replace the previous Site 1.
- To date, Massport has invested over $170 million and provided sound insulation for 36 schools and 11,515 residential units. In 2022, Massport sought funding for additional noise mitigation under its RSIP for eligible properties. Massport updated the **Noise Exposure Map (NEM)**, which determines eligibility, and established a pilot program with the FAA to sound insulate eligible homes and re-evaluate sound insulation in homes treated before 1993.
- Massport formally requested that the FAA initiate development and implementation of two procedures identified after completing a multi-year, collaborative research effort with Massachusetts Institute of Technology (MIT) and FAA to reduce noise by changing performance-based navigation (PBN) procedures and implementing flight performance modifications.

Noise Abatement Key Findings for Future Forecast

The modeled future forecast conditions represent a Future Planning Horizon with annual 53.5 million passengers and assumes approximately 495,000 total annual operations (1,356 average daily operations) by a fleet of aircraft types that accounts for some retirement of older aircraft but does not incorporate future aircraft and engine types that are not yet operational. Aircraft in the future forecast fleet are likely to have quieter and more efficient engines than older aircraft in the current fleet. The Future Planning Horizon DNL contours presented in this chapter are a conservative estimate of the future noise levels. It is expected, with the continued advancement in aircraft technology resulting in quieter engines, that the actual noise levels would be lower than modeled. The following details key findings on noise abatement for the Future Planning Horizon:

- The total number of nighttime operations for the Future Planning Horizon increases approximately 35 percent from 2022 levels, while the daytime operations are predicted to increase 30 percent. In comparison to 2019, the forecast scenario has about 1 percent fewer nighttime and 19 percent more daytime operations. Runway usage, based primarily on wind and weather conditions, is the controlling factor over the general distribution of noise around the airport.
- The area within the future forecast contours is larger than the area within the 2022 contours due to the expected increase in the number of aircraft operations. However, the DNL 65 dB contour remains within areas included in Massport's RSIP.

- The DNL contours prepared for the projected level of aircraft operations in the Future Planning Horizon result in 9,435 people exposed to noise levels of DNL 65 dB or greater. For comparison, 8,185 people are exposed to noise levels greater than or equal to DNL 65 dB in 2022. While population exposed to noise levels above 65 DNL are expected to increase by approximately 15 percent from 2022 to the Future Planning Horizon, they remain well below historical peaks.

7.1 Noise Regulatory Framework and Metrics

The following section provides a regulatory framework used for noise analysis, focusing particularly on Logan Airport's Noise Abatement rules and several Federal Aviation Regulations (FAR). It also describes key noise metrics established by the FAA used to examine the impact of noise exposure on humans.

7.1.1 Regulatory Framework

Appendix I, *Noise Supporting Documentation*, Section I.4, provides the noise regulatory framework that the noise analysis follows. Regulations discussed include:

- *Logan Airport Noise Abatement Rules and Regulations (Noise Rules)*:[2] The Noise Rules have been in effect since 1986. The Noise Rules place restrictions on certain aircraft and ground operations by time of day and runway, subject to implementation by FAA with regard to airport and airspace safety.
- *Federal Aviation Regulation (FAR) Part 36*: This regulation specifies the metrics, methods, and reporting required for aircraft noise certification.
- *FAR Part 150*: This regulation provides a process and guidance for voluntary FAA-sponsored noise assessment and abatement programs at airports.
- *FAR Parts 91 and 161*: These regulations address noise-related restrictions on aircraft operations.

7.1.2 Noise Metrics

The following common metrics are used in this chapter to describe and evaluate aircraft noise: Decibel (dB); "A"-weighted decibel (dBA); Day-Night Average Sound Level (DNL); **Time Above (TA)**; and **Effective Perceived Noise Level (EPNL)**. The Key Terminology at the beginning of this document includes brief descriptions of these terms and their usage. For a more in-depth description of noise metrics, refer to Appendix I, Section I.2.

Over the last decade or more, the FAA conducted a comprehensive study to evaluate the direct impacts to humans from noise exposure, and also the in-direct effects and impacts from annoyance factors. In 2021, the FAA published the study results from the multi-year research effort on the relationship between

2 Massachusetts Port Authority, Logan International Airport Noise Abatement Rules and Regulations, effective July 1, 1986, codified at 740 Code of Massachusetts Regulations (CMR) 24.01 et seq.

aircraft noise exposure and its effects on communities around airports.[3] This study's findings have informed the development of supplemental noise metrics used nationwide to better understand the noise environment. Further details on the FAA study are in Appendix I, Section I.4.

The *FAA Reauthorization Act of 2018* required that the FAA evaluate alternative metrics to the DNL standard and report on the findings within one year. The report was delivered to Congress on April 14, 2020,[4] and concluded that while no single noise metric can cover all situations, the DNL metric provides the most comprehensive way to consider the range of factors influencing exposure to aircraft noise. In addition, use of supplemental metrics is both encouraged and supported to further disclose and aid in the public understanding of community noise impacts.

In keeping with the FAA's conclusions and guidance, Massport provides DNL noise results along with various supplemental metrics, such as **cumulative noise index (CNI)**, TA, and Time Above Night in this *2022 ESPR* and in prior Logan Airport Environmental Data Reports (EDRs) and ESPRs.

7.2 2022 Noise Environment

The *2022 ESPR* noise assessment used the FAA-required noise model, AEDT version 3e. Inputs to the model include aircraft operations, types of aircraft operating during the day and at night, use of various runway configurations, and the location and frequency of aircraft flight paths to and from the Airport. A change in any one operational parameter can change noise metric values and alter noise exposure contour shapes, which represent an average annual day's (AAD) cumulative noise events.

Consistent with previous ESPR and EDR noise assessments, the following steps were employed for the 2022 noise analysis to enhance the accuracy of the modeling:

- Massport's NOMS collected flight track and operations data with detailed records for each flight, which enabled an AEDT model aircraft type to be assigned based on the specific aircraft and engine combination used for each 2022 flight at Logan Airport. The NOMS also provides noise measurement data for comparison to modeled noise results.[5]
- The AEDT model accessed U.S. Geological Survey digital terrain data to evaluate each noise receptor location at its specific elevation, which enhances the accuracy of the results.

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3 Federal Aviation Administration, Neighborhood Environmental Survey, 2021. https://www.faa.gov/regulations_policies/policy_guidance/noise/survey

4 U.S. Department of Transportation, Federal Aviation Administration. Report to Congress: FAA Reauthorization Act of 2018 (Pub. L. 115-254) Section 188 and Sec 173, April 14, 2020, https://www.faa.gov/about/plans_reports/congress/media/Day-Night_Average_Sound_Levels_COMPLETED_report_w_letters.pdf.

5 The noise measurement data are only used for reporting and are not used to calibrate the noise model.

- The population data analysis employed Geographic Information System (GIS) technology to calculate proportional estimates from 2020 U.S. Census[6] block group data, refining the accuracy of those counts.
- The modeling process used a proprietary AEDT pre-processor that prepares large quantities of NOMS data for processing by AEDT.[7] Use of the AEDT pre-processor improves modeling precision by:
  - Providing greater detail than standard AEDT analyses through the use of individual flight tracks taken directly from the NOMS system rather than relying on consolidated, representative flight tracks data.
  - Automating the production of noise contours directly from each individual radar trace recorded by the NOMS, which represents a single and complete flight operation, in other words, an aircraft takeoff or landing. For 2022, 376,948 traces were collected. Over 99.9 percent, or 376,575 traces, retained enough information to be converted by the pre-processor into AEDT flight tracks. Each radar trace was converted to a model flight track, allowing for the lateral dispersion of radar tracks to be retained in the modeling. The operations on these radar traces were then scaled to account for all the 378,613 operations in 2022.
- Modeling each operation for the actual time of day and specific runway use, rather than applying a generalized distribution to broad ranges of aircraft types.
- Selecting the specific airframe and engine combinations to model, on an operation-by-operation basis, based on the aircraft registration or a published composition of the fleets of the specific airlines operating at Logan Airport.
- Capturing new aircraft types introduced and flight schedule contraction and expansion.
- Using each flight's origin and destination to select the proper stage length.
- Using each aircraft's actual altitude profile to select from the available flight profiles for each aircraft type in the AEDT database.

6 The 2020 U.S. Census data became available in late 2021. For the previous decade, 2010 U.S. Census data was used for the Logan Airport population data analyses.

7 Standard AEDT analyses (without the pre-processor) rely on assigning all operations to a limited number of prototypical or representative tracks, apply a generalized distribution for runway usage and day/night split, and rely on other aggregated data for choice of modeled aircraft type and flight profile.

7.2.1 2022 Noise Model Inputs

Appendix I, Section I.2 contains detailed information about the noise model. The following sections summarize the average-day operations as used in the noise modeling and compare 2022 inputs to the inputs for recent years.

7.2.1.1 2022 Fleet Mix

Since 2004, Massport has relied primarily on NOMS data as the main source of input for noise calculations, because NOMS data are typically more accurate than the information reported by airlines. The NOMS produces a list of approximately 500 different aircraft types used at Logan Airport during a year, including the large passenger and cargo jets operated by air carriers, as well as the wide variety of small corporate jets and propeller aircraft flown by **general aviation (GA)** users.

The aircraft types identified by the NOMS data were matched to the types in the AEDT 3e database. The final list of modeled aircraft, used as an input to AEDT, is presented in detail in Appendix I, Section I.2.4. Massport reports operations summarized into several key categories: commercial (passenger and cargo) or GA operations; Stage 2, 3, 4 or 5 aircraft noise categories;[8] and turboprop or propeller (non-jet) aircraft. Additionally, aircraft operations are split into daytime and nighttime periods, where nighttime hours are defined as 10:00 PM to 7:00 AM. Each operation occurring during nighttime hours is counted as 10 such operations in the calculation of DNL[9] to account for annoyance factors. Appendix I, Section I.2.4 includes further details on the 2022 fleet mix including a breakdown by airline.

Table 7-1 summarizes the number of average daily operations by aircraft category in 2022 and provides comparison data for 2019, 2020, and 2021, as well as for reference years 1990, 1998 (the year of peak operations at Logan Airport), 2000, and 2010. Appendix I, Section I.3 includes available data for those years and for each year prior to 2019. Overall annual operations decreased dramatically from 2019 due to the pandemic, with 2020 being the low point. Annual operations increased in 2021 compared to 2020 and continued to increase in 2022. However, the 2022 total count remains less than the 2019 (pre-pandemic) total operational count.

Commercial Operations

As shown in **Table 7-1**, the majority of operations at Logan Airport are commercial (passenger and cargo) flights; commercial operations accounted for approximately 92 percent of total operations in 2022. Flights by GA aircraft made up the remaining portion.

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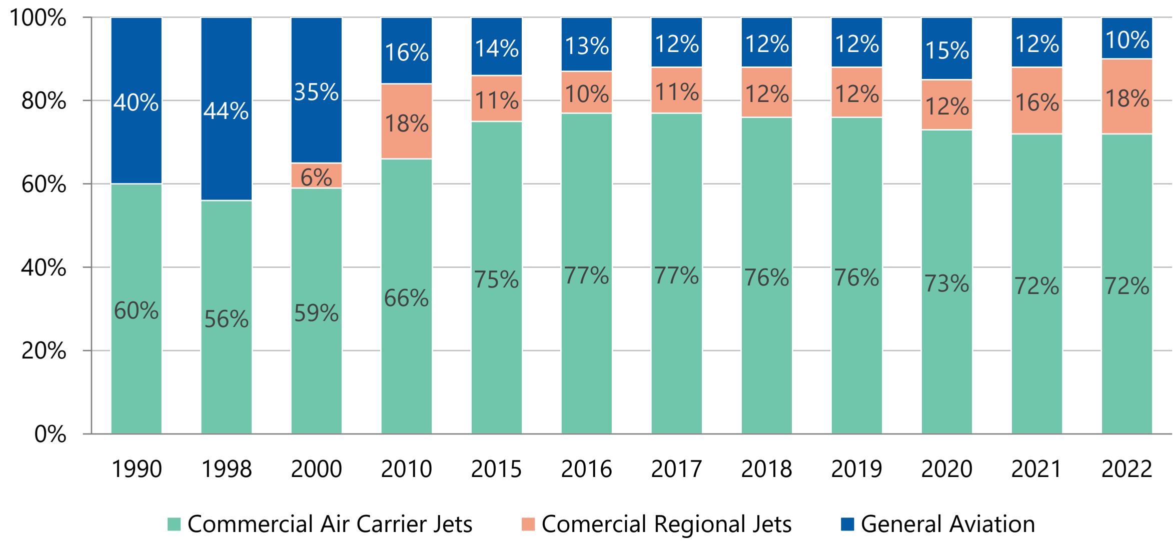
8 Stage 3, 4. and 5 categories include any aircraft that meet the requirements for the stage certification. Note that many aircraft originally certificated as Stage 3 or Stage 4 would in fact satisfy the newer Stage 4 and 5 criteria if recertificated. FAA does not require aircraft to be recertificated and FAA has no plans at this time to restrict Stage 3 operations. Massport does not have the regulatory authority to restrict aircraft using Logan Airport.

9 Multiplying nighttime operations by 10 is mathematically equivalent to adding 10 decibels to the aircraft sound level in the DNL calculation.

Figure 7-1 presents the commercial aircraft operations by category in terms of the percent of the total operations (aircraft takeoffs and landings) for the years 2000, 2010, and each year from 2015 through 2022. This figure demonstrates the decrease in commercial non-jet operations after 2000 and the more recent rise of the RJ category in the fleet mix. As shown in **Figure 7-1** and **Table 7-1**, air carrier jets continue to make up over 70 percent of commercial operations in 2022.

As noted in recent EDRs, the share of operations by RJ aircraft[10] at Logan Airport has increased since 2017, reversing the trend seen from 2010 through 2016, when Logan Airport fleet showed a continuous shift toward larger aircraft. In 2022, the RJ share of total airport activity surpassed the level of RJ aircraft before the pandemic. The share of non-jets in the commercial fleet increased in the pandemic years (2020 and 2021), but that was a result of larger decrease in the share of operations by jets; as jet operations counts have rebounded, the non-jet share has decreased.

Figure 7-1 Fleet Mix of Commercial Operations (Passenger and Cargo) at Logan Airport



Source: HMMH, 2023.

Notes: Includes both passenger and cargo operations.
Since 2010, the split between air carrier jets and regional jets (RJs) is 90 seats with RJs having fewer than 90 seats.
Prior to 2010, the split between air carrier jets and RJs was 100 seats with RJs having fewer than 100 seats.
The share of RJs as a percentage of the commercial fleet was not tracked prior to 2000.

10 RJs are defined as those aircraft with 90 or fewer seats, consistent with the categorization in Chapter 3. 10 For years prior to 2010, the RJs in EDRs and ESPRs were classified as aircraft with fewer than 100 seats. When RJs first started gaining popularity, the aircraft types available were typically 50 seats or fewer with the traditional air carrier jet being 100 seats and higher. As newer aircraft types have become available, the smaller 35- to 50-seat types have been replaced by 70- to 99-seat types, with the 90 and above seat types flying many of the traditional air carrier routes. Therefore, the 90 seat and higher aircraft types are classified as air carrier.

Table 7-1 Modeled Average Daily Operations by Commercial and General Aviation (GA) Aircraft[1]

		1990[2]	1998	2000[3]	2010[4]	2019	2020	2021	2022	Change 2019 to 2022	Change 2021 to 2022
Commercial Aircraft Operations (Passenger and Cargo)											
Air Carrier Jets	Day	601.3	626.4	649.0	521.6	655.6	319.0	382.7	567.8	-13.4%	48.4%
	Night[5]	77.2	101.5	99.8	94.0	174.3	68.4	85.2	123.4	-29.2%	44.8%
	Total	678.5	727.8	748.7	615.6	829.9	387.4	467.9	691.3	-16.7%	47.7%
Regional Jets	Day	N/A[2]	N/A[2]	78.1	152.6	123.5	57.4	95.9	153.9	24.7%	60.5%
	Night[5]	N/A[2]	N/A[2]	3.9	13.9	11.9	3.8	7.2	13.0	9.0%	79.9%
	Total	N/A[2]	N/A[2]	82.0	166.6	135.4	61.2	103.1	167.0	23.3%	61.9%
Commercial Non-Jets	Day	444.4	552.6	409.6	138.5	124.1	79.3	91.7	95.0	-23.4%	3.7%
	Night[5]	11.7	21.9	21.6	5.2	1.7	0.3	0.2	0.4	-73.6%	88.8%
	Total	456.1	574.4	431.2	143.7	125.8	79.7	91.9	95.5	-24.1%	3.9%
Total Commercial Operations	Day	1,045.7	1,178.9	1,141.8	812.8	903.2	455.8	570.3	816.8	-9.6%	43.2%
	Night[5]	89.0	123.3	125.5	113.1	187.9	72.5	92.7	136.9	-27.2%	47.7%
	Total	1,134.7	1,302.2	1,267.4	925.9	1,091.1	528.3	663.0	953.7	-12.6%	43.9%
GA Aircraft Operations											
GA Jets	Day	N/A[2]	35.8	47.4	28.1	53.2	25.3	46.0	60.8	14.3%	32.2%
	Night[5]	N/A[2]	4.6	3.9	3.3	4.8	2.4	3.7	5.2	8.6%	41.2%
	Total	N/A[2]	40.4	51.2	31.3	58.0	27.7	49.7	66.0	13.8%	32.9%
GA Non-Jets	Day	N/A[2]	37.3	34.6	8.2	19.4	9.5	15.1	16.2	-16.2%	7.4%
	Night[5]	N/A[2]	16.3	1.8	0.7	1.9	0.7	1.1	1.4	-28.2%	24.5%
	Total	N/A[2]	53.57	36.4	8.9	21.3	10.3	16.2	17.6	-17.2%	8.6%
Total GA Operations	Day	N/A[2]	73.1	81.9	36.3	72.5	34.8	61.1	77.0	6.2%	26.1%
	Night[5]	N/A[2]	20.9	5.7	4.0	6.7	3.1	4.8	6.6	-1.8%	37.3%
	Total	N/A[2]	94.0	87.6	40.2	79.2	38.0	65.9	83.6	5.5%	26.9%

Table 7-1 Modeled Average Daily Operations by Commercial and General Aviation (GA) Aircraft[1]

		1990[2]	1998	2000[3]	2010[4]	2019	2020	2021	2022	Change 2019 to 2022	Change 2021 to 2022
Total Aircraft Operations											
Combined Commercial and GA	Day	1,045.7	1,252.0	1,223.8	849.0	975.7	490.6	631.4	893.8	-8.4%	41.6%
	Night[5]	89.0	144.2	131.2	117.1	194.6	75.7	97.5	143.5	-26.3%	47.2%
	Total[2]	1,134.7	1,396.2	1,355.0	966.1	1,170.3	566.3	728.9	1,037.3	-11.4%	42.3%

Source: Massport's Noise Monitoring System, Revenue Office, and HMMH, 2022.
Notes: Totals and percentages may not add exactly due to rounding.
1 Operations include scheduled and unscheduled operations. Data for other years are available in Appendix I, Section I.2.3.
2 Regional Jets (RJs) were not tracked separately prior to 2000. Totals prior to 1998 do not include GA operations.
3 Prior to 2010, the split between air carrier jets and RJs is 100 seats with RJs having less than 100 seats.
4 Since 2010, the split between air carrier jets and RJs is 90 seats with RJs having less than 90 seats.
5 Nighttime operations occur between 10:00 PM and 7:00 AM.

FAA Jet Aircraft Noise Categories

Aircraft noise standards for all jet aircraft in the U.S., including those currently operating at Logan Airport, are defined in the Code of Federal Regulations (CFR) Title 14 Part 36, *Noise Standards: Aircraft Type and Airworthiness Certification* (14 CFR Part 36).[11] Accordingly, jet aircraft are categorized according to their noise emission levels in FAA Advisory Circular 36-1H, *Noise Levels for U.S. Certificated and Foreign Aircraft*, as either Stage 3, Stage 4, or Stage 5.[12] The oldest and noisiest aircraft, Stage 1, were phased out of service in the 1980s. The FAA banned Stage 2 aircraft operations in the contiguous U.S. as of December 31, 2015. The highest (quietest) standard of noise classification called Stage 5 was adopted by FAA in 2017. Stage 5 aircraft are certificated as a cumulative 17 dB below Stage 3 standards and are effective for new aircraft type certification after December 31, 2017, or December 31, 2020, depending on the weight of the aircraft.[13] Appendix I, Section I.1.4, provides more detail on the aircraft stage designations regulated by 14 CFR Part 36 and the regulatory framework governing aircraft noise.

About 99 percent of the 2022 commercial jet fleet at Logan Airport meets at least Stage 4 certification requirements with approximately 29 percent of Logan Airport's commercial jet fleet met the requirements for certification in the FAA's newest noise category, Stage 5.

11 Code of Federal Regulations Title 14 Part 36, Noise Standards: Aircraft Type and Airworthiness Certification, as amended.
12 U.S. Department of Transportation, Federal Aviation Administration, Advisory Circular 36-1H, Noise Levels for U.S. Certificated and Foreign Aircraft, Change 1, May 25, 2012.
13 The Stage 5 Final Rule was published on October 5, 2017. https://www.federalregister.gov/documents/2017/10/04/2017-21092/stage-5-airplane-noise-standards.

Table 7-2 Example Stage 3, Stage 4, and Stage 5 Aircraft Types Operating at Logan Airport

Aircraft Name	Aircraft/ Engine Model	Aircraft Noise Stage Equivalent	Cumulative Noise Level (dB)[1]	Stage 3 Noise Limit (dB)	Difference (dB)	Percent Below Limit
Embraer 175	EMB175	3	272.8	282.0	9.2	3.3%
Boeing 737-700	CFM56-7B22	4	274.1	288.1	14.0	4.9%
Airbus 220-300	PW1524G-3	5	262.9	288.2	25.3	8.8%

Source: EASA MAdB Jets (200213) Certification data: https://www.easa.europa.eu/domains/environment/easa-certification-noise-levels
Cumulative levels include lateral, overflight, and approach noise.

Examples of Stage 3, Stage 4, and Stage 5 aircraft types operating at Logan Airport in 2022 are shown in **Table 7-2**. As shown in the table, noise levels are lower with each successive stage of aircraft design. The regulation provides a Stage 3 noise limit for each aircraft that is dependent on the aircraft's weight. A cumulative level, determined by summing the certification lateral, flyover, and approach values, can be compared against the permissible limit. The columns on the right side of **Table 7-2** show this sum, the noise limit for that aircraft, and the dB difference. The Stage 5 aircraft shows the greatest difference, at over 25 dB below the Stage 3 limit.

Due to noise differences among aircraft, Massport tracks operations by **Aircraft Certification Noise Categories**. **Table 7-3** provides the percentage of commercial jet operations by stage for the past four years with 1990, 1998, 2000, and 2010 also reported for historical context. **Table I-3** in Appendix I, Section I.2.4, provides data on aircraft stage types in the fleet mix for every year since 1998. **Table I-29** in the appendix lists the numbers of operations in recent years by stage for each airline with over 100 annual operations.

Table 7-3 Percentage of Commercial Jet Operations by 14 CFR Part 36 Stage Category

Year[1]	Meeting Stage 5 Requirement	Meeting Stage 4 Requirement	Certificated Stage 3	Recertificated Stage 3[3]	Stage 2 (Greater than 75,000 lbs.)	Total
1990	N/A	N/A	51.1%	0.0%	48.9%	100%
1998	N/A	N/A	65.9%	21.7%	12.4%	100%
2000	N/A	N/A	75.0%	24.0%	1.0%	100%
2010	N/A	93.2%	5.7%	1.1%	0.0%	100%
2019	15.2%	82.9%	2.0%	0.0%	0.0%	100%
2020	28.5%	68.7%	2.8%	0.0%	0.0%	100%

Table 7-3 Percentage of Commercial Jet Operations by 14 CFR Part 36 Stage Category

Year[1]	Meeting Stage 5 Requirement	Meeting Stage 4 Requirement	Certificated Stage 3	Recertificated Stage 3[3]	Stage 2 (Greater than 75,000 lbs.)	Total
2021	29.1%	69.2%	1.7%	0.0%	0.0%	100%
2022	33.6%	65.3%	1.1%	0.0%	0.0%	100%

Source: Massport's Noise Monitoring System, Revenue Office, and HMMH 2022.
Notes: Totals and percentages may not add exactly due to rounding.
1 Data for all years beginning in 1998 are available in Appendix I, Section I.2.4.
2 Aircraft counted as Stage 4 are aircraft that are certificated Stage 4 or would qualify if recertificated. Certificated Stage 4 aircraft became available in 2006 and the level of aircraft meeting Stage 4 requirements was not determined prior to 2009.
3 Recertificated Stage 3 aircraft are aircraft originally manufactured as a certificated Stage 1 or 2 aircraft under Federal Aviation Regulation (FAR) Part 36 that either have been retrofitted with hush kits or have been re-engine to meet Stage 3 requirements.
4 In 2010, only one commercial carrier with more than 100 annual operations continued to use recertificated Stage 3 aircraft at Logan Airport (FedEx). A few charter operators also used these aircraft.
5 Aircraft counted as Stage 5 are aircraft that are certificated Stage 5 or would qualify if recertificated. Stage 5 aircraft certification was available beginning in 2018 for aircraft with a maximum certificated takeoff weight greater than 121,254 pounds. The level of aircraft that meet Stage 5 requirements was not determined prior to 2016.

Nighttime Operations

Massport keeps track of operations occurring during the DNL nighttime period of 10:00 PM to 7:00 AM, when each modeled flight is weighted tenfold in calculations of noise exposure. **Table 7-4** shows this nighttime activity by distinct groups of aircraft. Approximately 137 commercial jet nighttime operations per night occurred in 2022, a level approximately 27 percent lower than pre-covid operations in 2019. Both commercial non-jet nighttime activity and GA nighttime operations were lower than 2019 levels. Nighttime operations represented approximately 14 percent of total operations for 2022 at Logan Airport. For reference, in 2019, nighttime operations represented approximately 17 percent of operations. **Figure 7-2** is a graphical representation of the number and composition of the nighttime flight operations over the years.

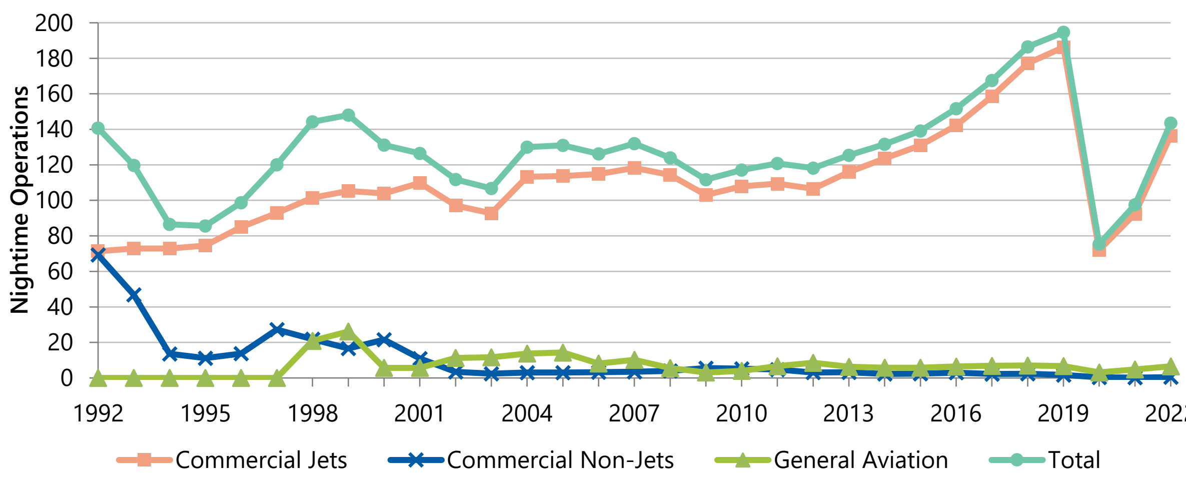
Of the commercial jet nighttime operations, cargo airlines accounted for approximately 6 percent in 2022. For comparison, in 2019, 5 percent of the commercial jet nighttime operations were cargo planes.

Table 7-4 Modeled Nighttime Operations (10:00 PM to 7:00 AM) at Logan Airport Per Night[1]

Year	Commercial Jets	Commercial Non-Jets	General Aviation	Total
1990	77.2	11.7	N/A2	89.0
1998	101.4	21.9	20.93	144.2
2000	103.9	21.6	5.7	131.2
2010	107.9	5.2	4.0	117.1
2019	186.2	1.7	6.7	194.6
2020	72.2	0.3	3.1	75.7
2021	92.5	0.2	4.8	97.5
2022	136.5	0.4	6.6	143.5
Change (2019 to 2022)	-49.7	-1.3	-0.1	-51.1
Percent Change (2019 to 2022)	-26.7%	-73.6%	-1.8%	-26.3%
Change (2021 to 2022)	44.0	0.2	1.8	46.0
Percent Change (2021 to 2022)	47.6%	88.8%	37.3%	47.2%

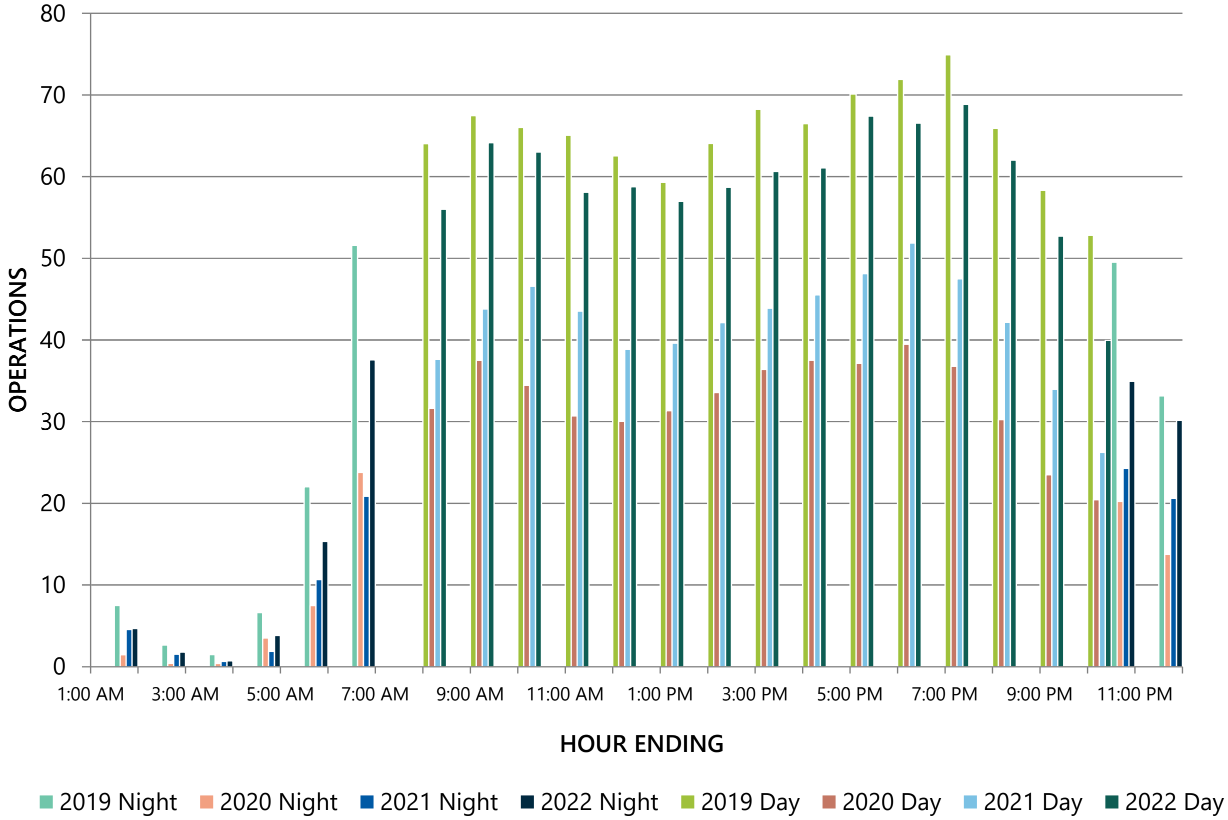
Source: Massport and L3Harris NOMS data; and HMMH, 2023.
Notes: Totals and percentages may not add exactly due to rounding.
1 Data for all years beginning in 1990 are available in Appendix I, Section I.2.6.
2 Totals prior to 1998 do not include general aviation (GA) operations.
3 1998 was the first year GA operations were reported and included in the total nighttime operations.

Figure 7-2 Nighttime Operations 2022



Source: HMMH

Figure 7-3 Logan Airport Average Hourly Operations, 2019 - 2022



Source: HMMH, 2023.

As in years past, the majority of 2022 nighttime operations (between 10:00 PM and 7:00 AM) occurred either before midnight or after 5:00 AM, as shown in **Figure 7-3**, to accommodate connecting flights and international time zones. The proportion occurring in the "shoulder hours" between 10:00 PM and midnight or between 5:00 AM and 7:00 AM was approximately 81 percent of total nighttime operations in 2019, 76 percent in 2021, and 83 percent in 2022.

7.2.1.2 2022 Runway Use

Figure 7-4 shows Logan Airport's runways. Runway use refers to the frequency with which aircraft use each of these runways during the year, as dictated or permitted by availability, wind, weather, aircraft performance, demand, and air traffic control. Runway 15R-33L and Runway 4R-22L are Logan Airport's longest runways; each of these is just over 10,000 feet in length.

For noise abatement reasons, Runway 15R-33L is the preferred runway to use at night, with arrivals to Runway 33L and departures from Runway 15R (known as head-to-head procedures), to keep flights over Boston Harbor as much as possible and away from noise-sensitive land uses. Many of these flights do fly over the North Shore or South Shore communities, but not until after reaching altitudes of over one mile high.

During other periods of the day, Runway 9 and 22R are used primarily for departures, and Runways 4R and 22L are used primarily for arrivals. Typically, Runways 27, and 33L are used for both arrivals and departures. Runway 14-32 is unidirectional; there are no arrivals to Runway 14 and no departures from Runway 32. Additionally, Runway 14-32 can be used only during northwest or southeast wind conditions[14] when winds are 10 knots or greater. Under certain northwest wind conditions, Runway 32 provides FAA with a second arrival runway, thereby reducing delays at Logan Airport. Runway 14 is available for departures but is rarely used. Runway 15L-33R is Logan Airport's shortest runway, at under 3,000 feet long. This runway is primarily used for small, non-jet aircraft arrivals.

Table 7-5 provides a summary of jet runway use conditions in 2022, with recent years and historical years provided for comparison. Weather is the primary driver of runway use at Logan Airport. There were no extended main runway closures in 2022. Detailed runway usage for all aircraft types (jet and non-jet) for 2022 is provided in Appendix I, Section I.2.5.

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14 The Runway 14-32 restrictions are a condition of the Logan Airside Improvements Project Record of Decision (ROD). Federal Aviation Administration (FAA) Boston Logan Airport Noise Study Categorical Exclusion Record of Decision (CATEX ROD), Issued October 16, 2007.

Figure 7-4 Logan Airport Runways

2022 Environmental Status and Planning Report

Terminal Buildings	Runway 4L-22R
Runway 14-32	Runway 4R-22L
Runway 15L-33R	Runway 9-27
Runway 15R-33L	

0 450 900 1800 Feet

Table 7-5 Summary of Annual Jet Aircraft Runway Use[1]

	Runway									
	4L	4R	9	14[2]	15R	22L	22R	27	32[2]	33L
1990										
Departures	0%	3%	21%	N/A	10%	2%	36%	20%	N/A	7%
Arrivals	1%	25%	0%	N/A	2%	14%	0%	28%	N/A	29%
1998										
Departures	0%	8%	35%	N/A	6%	5%	28%	14%	N/A	5%
Arrivals	2%	41%	0%	N/A	2%	7%	0%	28%	N/A	19%
2000										
Departures	0%	8%	35%	N/A	4%	3%	30%	15%	N/A	6%
Arrivals	4%	40%	0%	N/A	1%	7%	0%	28%	N/A	20%
2010										
Departures	0%	4%	28%	<1%	8%	2%	31%	10%	0%	17%
Arrivals	5%	28%	0%	0%	1%	15%	0%	32%	1%	16%
2019										
Departures	0%	4%	30%	0%	4%	2%	28%	12%	0%	20%
Arrivals	4%	28%	0%	0%	<1%	29%	<1%	22%	2%	15%
2020										
Departures	0%	5%	19%	0%	7%	2%	33%	13%	0%	21%
Arrivals	1%	23%	0%	0%	4%	36%	<1%	16%	1%	19%
2021										
Departures	0%	4%	24%	0%	6%	2%	29%	14%	0%	21%
Arrivals	1%	25%	0%	0%	3%	32%	<1%	17%	1%	20%
2022										
Departures	0%	4%	27%	0%	5%	2%	33%	6%	0%	23%
Arrivals	2%	28%	0%	0%	1%	33%	<1%	23%	2%	11%

Source: Massport L3Harris NOMS data and HMMH, 2023.

Notes: These data reflect actual percentages of jet aircraft operations on each runway. They should not be confused with effective runway use.

Jet aircraft are not able to use Runway 15L or 33R due to its length of only 2,557 feet.

Totals may not add exactly due to rounding.

N/A Not available.

1 Data for all years beginning in 1990 are available in Appendix I, Section I.2.5.

2 Runway 14-32 opened in late November 2006. Runway 14-32 is unidirectional with no arrivals to Runway 14 and no departures from Runway 32.

Preferential Runway Advisory System (PRAS)

In 1982, Massport developed the **Preferential Runway Advisory System (PRAS)** to provide an equitable distribution of Logan Airport's noise impacts on surrounding communities. Massport enhanced the system in 1990 and in subsequent years. The two primary objectives of PRAS were to equitably distribute noise on an annual basis and to provide short-term relief from continuous operations over the same neighborhoods near the Airport. PRAS consisted of two parts:

- Set of specific runway use goals to address the PRAS objectives.
- Computer program that provides runway configuration recommendations to air traffic controllers based on weather, traffic, and PRAS goals.

In February 2004, the PRAS system was suspended due to an upgrade of the FAA radar system during the consolidation of the Boston Terminal Control Center at the new facility in Merrimack, New Hampshire.

During Phase 2 of the Boston Logan Airport Noise Study (BLANS), the Massport Community Advisory Committee (Massport CAC) voted to abandon PRAS because it had not achieved the intended noise abatement.[15] Phase 3 of the BLANS focused on updating the Runway Use Program. Operational tests of a new program began in November 2014 and continued through September 2016. The BLANS project ended in 2016 without the Massport CAC agreeing on a new Runway Use Program. A final BLANS project report was issued in April 2017.

Although PRAS is not in effect at Logan Airport, Massport continues to report on key PRAS statistics for public information purposes. **Table 7-6** provides the original PRAS goals and a comparison of **effective runway use**[16] from 2019, 2021, and 2022. Massport also continues to collect and report data pertaining to PRAS's second objective: relief from continuous operations over the same neighborhoods near the Airport. Section 7.2.3.2 presents that data.

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15 BLANS Level 3 Screening Analysis, FAA, December 2012, Page E-2.

16 Effective usage refers to runway use which applies a factor of ten to the night operations, similar to DNL.

Table 7-6 Effective Jet Aircraft Runway Use in Comparison to Preferential Runway Advisory System (PRAS) Goals

Runway End	PRAS Effective Usage Goals		Effective Usage		2021 Effective Usage		2022 Effective Usage	
	ARR	DEP	ARR	DEP	ARR	DEP	ARR	DEP
4R/4L	21.1%	5.6%	24.0%	3.3%	21.6%	4.0%	23.1%	3.6%
9	0.0%	13.3%	0.0%	23.6%	0.0%	19.1%	0.0%	22.9%
15R	8.4%	23.3%	0.3%	9.2%	2.2%	14.8%	0.9%	14.0%
22L/22R	6.5%	28.0%	35.5%	30.3%	32.7%	25.9%	37.2%	29.2%
27	21.7%	17.9%	18.3%	15.5%	15.0%	12.4%	19.1%	6.7%
33L	42.3%	11.9%	21.3%	18.1%	28.3%	23.8%	18.9%	23.5%
14[1]	N/A	N/A	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
32[1]	N/A	N/A	0.7%	0.0%	0.3%	0.0%	0.8%	0.0%

Source: PRAS documentation, Massport NOMS data and HMMH, 2023

1 Runway 14-32 opened following the suspension of PRAS; consequently, PRAS goals were not established for this runway.

7.2.1.3 2022 Flight Tracks

As described in the *Noise Modeling Process* section of this chapter, a data pre-processor imports data into AEDT. Instead of using representative model flight tracks, the AEDT pre-processor converts each NOMS track to an AEDT model track and then models the scaled operation on that track.[17] Appendix I, Section I.2.6, provides more information about the pre-processor. The pre-processor step allows Massport to account for runway closures and/or temporary or permanent airspace changes that occur during the year, events which would be much more difficult to accurately capture with conventional modeling methods.

The AEDT modeling incorporated 376,575 flight tracks to calculate the noise levels surrounding Logan Airport for calendar year 2022. **Figure 7-5** through **Figure 7-11** provide samples of the flight tracks used in AEDT to develop the DNL contours.[18] The figures show arrivals and departures throughout 2022 from a representative sample for each of three aircraft categories: air carrier jets, RJs, and non-jets.

17 The pre-processor method provides a one to-one correspondence of radar tracks to model tracks and ensures that the lateral and vertical dispersion of aircraft types are consistent with the radar data.

18 The flight tracks shown in these figures are a representative sample, selected uniformly from the complete track set to match the overall annual runway use.

By 2011, FAA completed the implementation of Area Navigation (RNAV) departure and arrival procedures from the BLANS. RNAV technology allows aircraft to navigate precisely between any two geographical points. In addition to the RNAV procedures recommended from the BLANS study, other RNAV procedures implemented at Logan Airport (such as the RNAV arrivals into the terminal airspace) are part of a national FAA initiative, implemented to improve safety and efficiency in the airspace system. These procedures result in consolidated flight paths and greater predictability along the flight route. The FAA implemented similar procedures at Denver, Minneapolis, Baltimore-Washington, Houston, Dallas, Chicago Midway, Phoenix, and Seattle Airports.

7.2.1.4 2022 Meteorological Data

AEDT has several settings that reflect aircraft performance profiles and sound propagation based on meteorological data. Meteorological settings include average temperature, dew point, barometric pressure, and relative humidity at the Airport. Massport obtained weather data for 2022 from the National Oceanic and Atmospheric Administration's National Centers for Environmental Information and used the applicable annual averages in modeling all 2022 operations.

Figure 7-5 Air Carrier Jet Departures Flight Tracks

2022 Environmental Status and Planning Report

Air Carrier Jet Departures

Municipal Boundary

This figure displays air carrier jet departures following the FAA RNAV departure procedures.

0 4,000 8,000 Feet

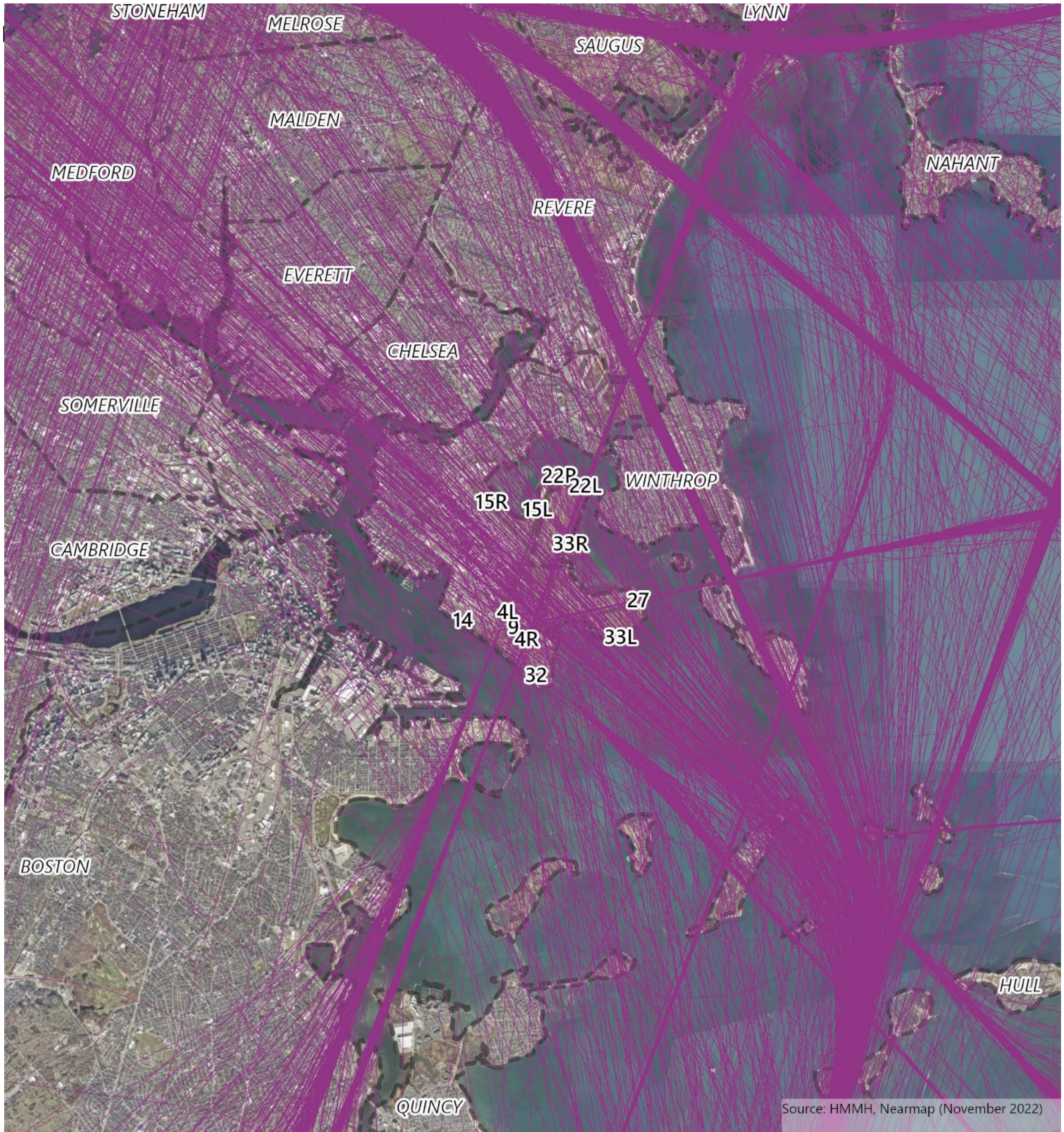


Figure 7-6 Air Carrier Jet Arrivals Flight Tracks

2022 Environmental Status and Planning Report

This figure displays air carrier jet arrivals. The RNAV arrival procedures are very evident in the 2022 modeled data, with a narrowing of the flight tracks into concentrated areas.

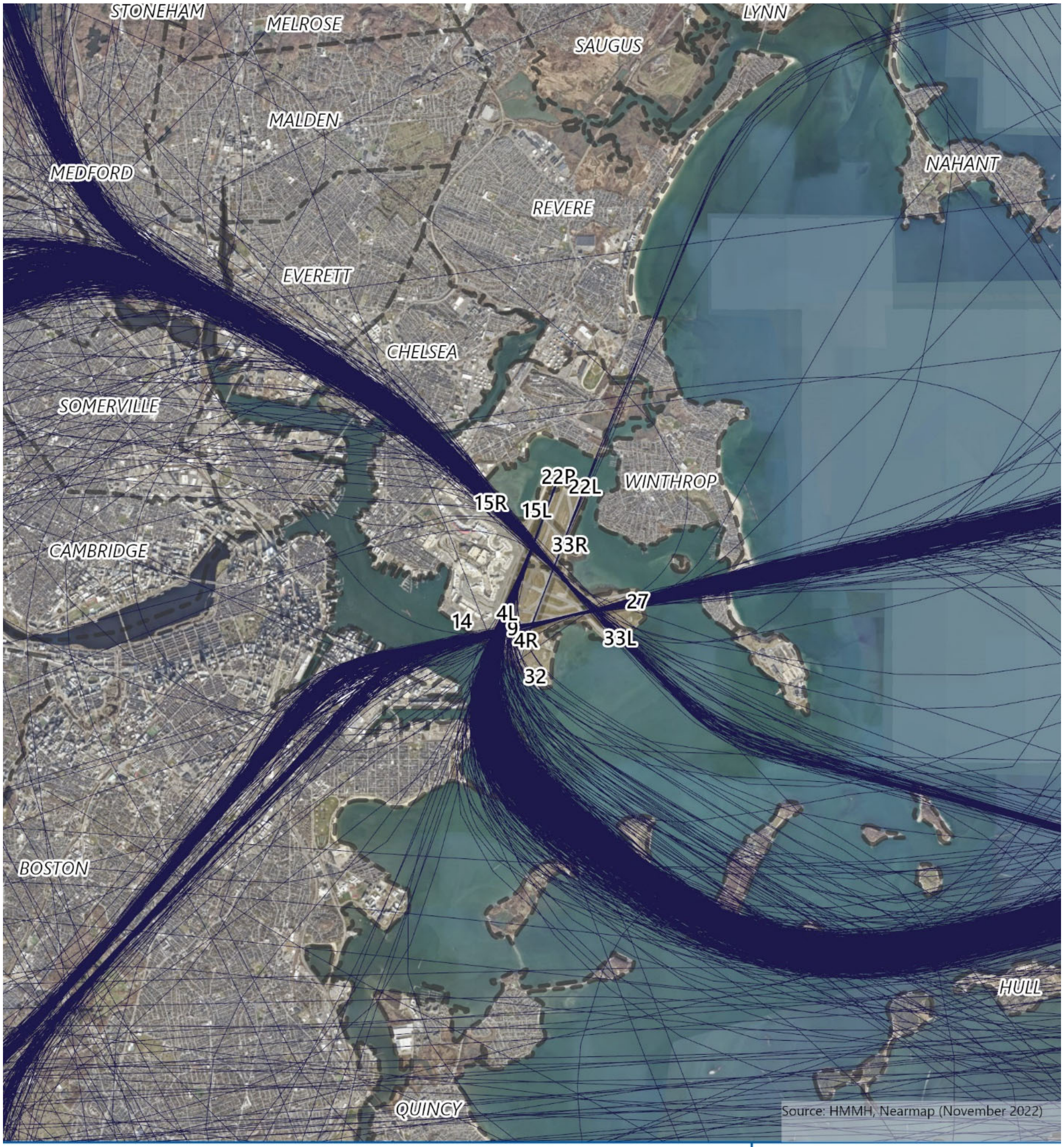


Figure 7-7 Regional Jet Departure Flight Tracks

2022 Environmental Status and Planning Report

Regional Jet Deperature

Municipal Boundary

This figure displays the RJ departures following the RNAV departure routes in the same manner as the larger air carrier jets.

0 4,000 8,000 Feet

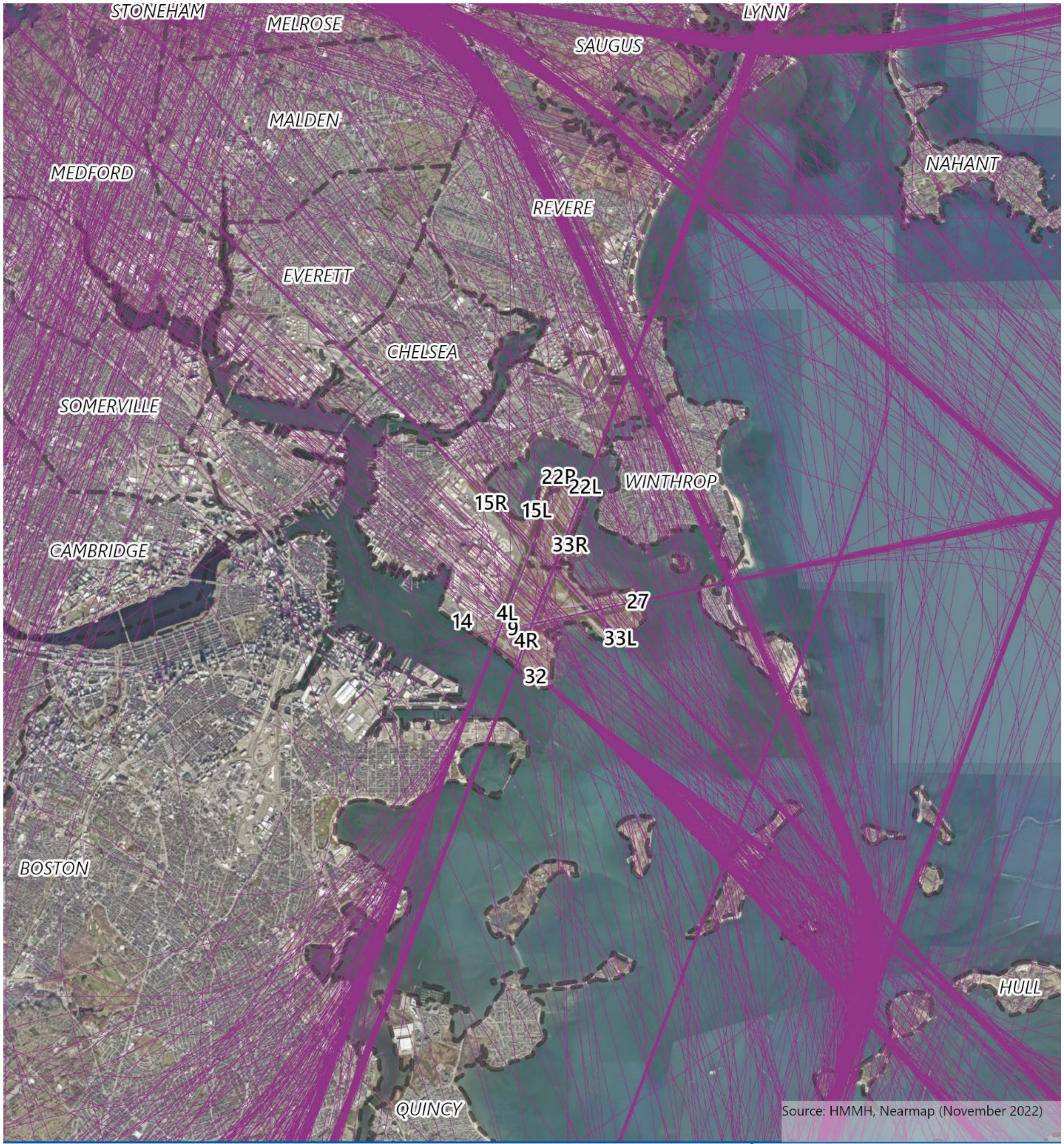


Figure 7-8 Regional Jet Arrivals Flight Tracks

2022 Environmental Status and Planning Report

Regional Jet Arrivals

Municipal Boundary

This figure displays the RJ arrivals, again resembling the patterns of the larger air carrier jets.

0 4,000 8,000 Feet

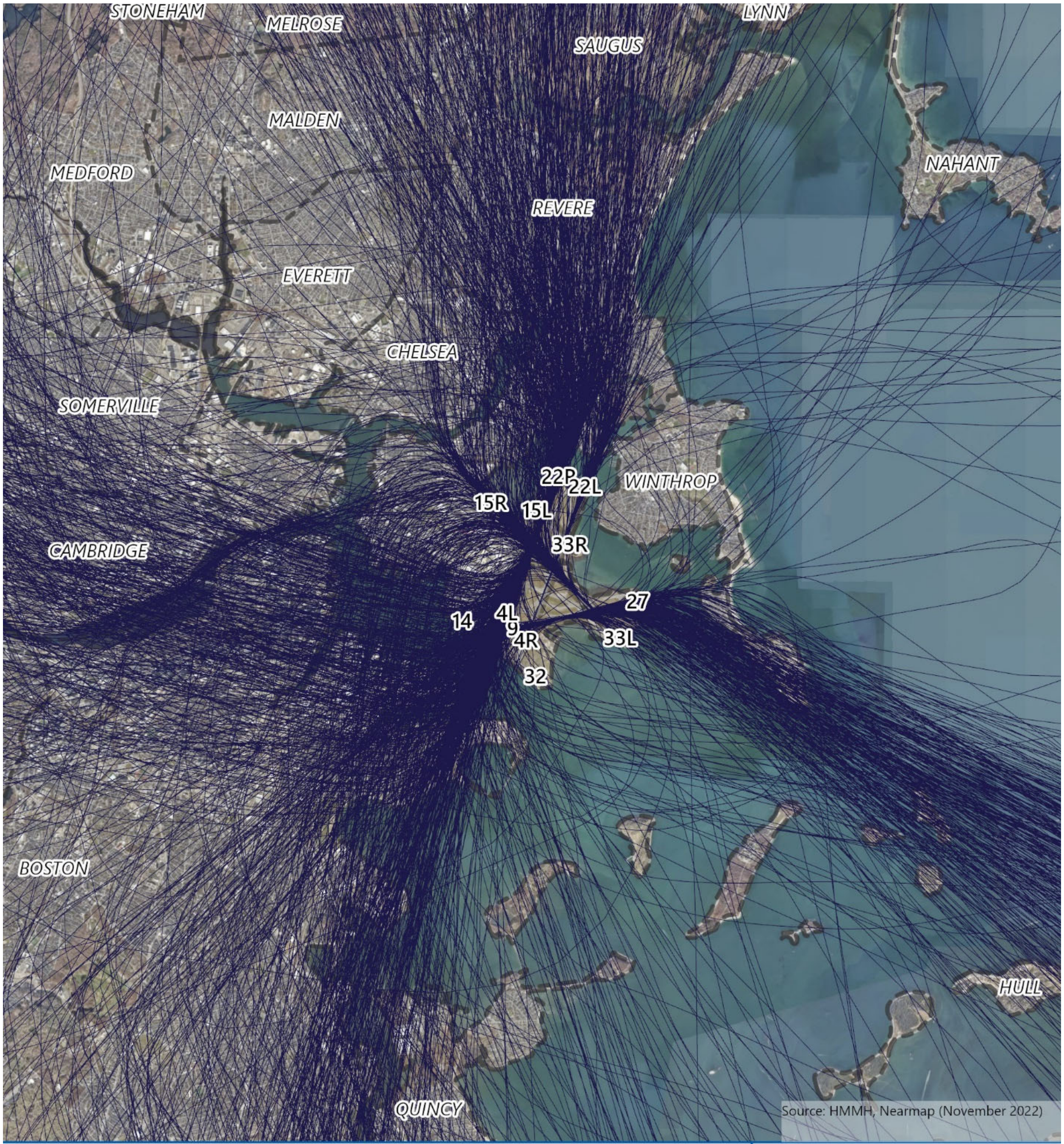


Figure 7-9 Non-Jet Departure Flight Tracks

2022 Environmental Status and Planning Report

Non-Jet Deperatures

Municipal Boundary

This figure displays the non-jet departures. Non-jet aircraft tend to turn early off the runways, not following the jet departure routes. Non-jet departures from Runways 4L, 22R, 33L, and 27 are allowed to turn over residential areas, whereas the jet aircraft are not. This also keeps the non-jet aircraft out of the jet departure paths, allowing for efficient jet departures.

0 4,000 8,000 Feet

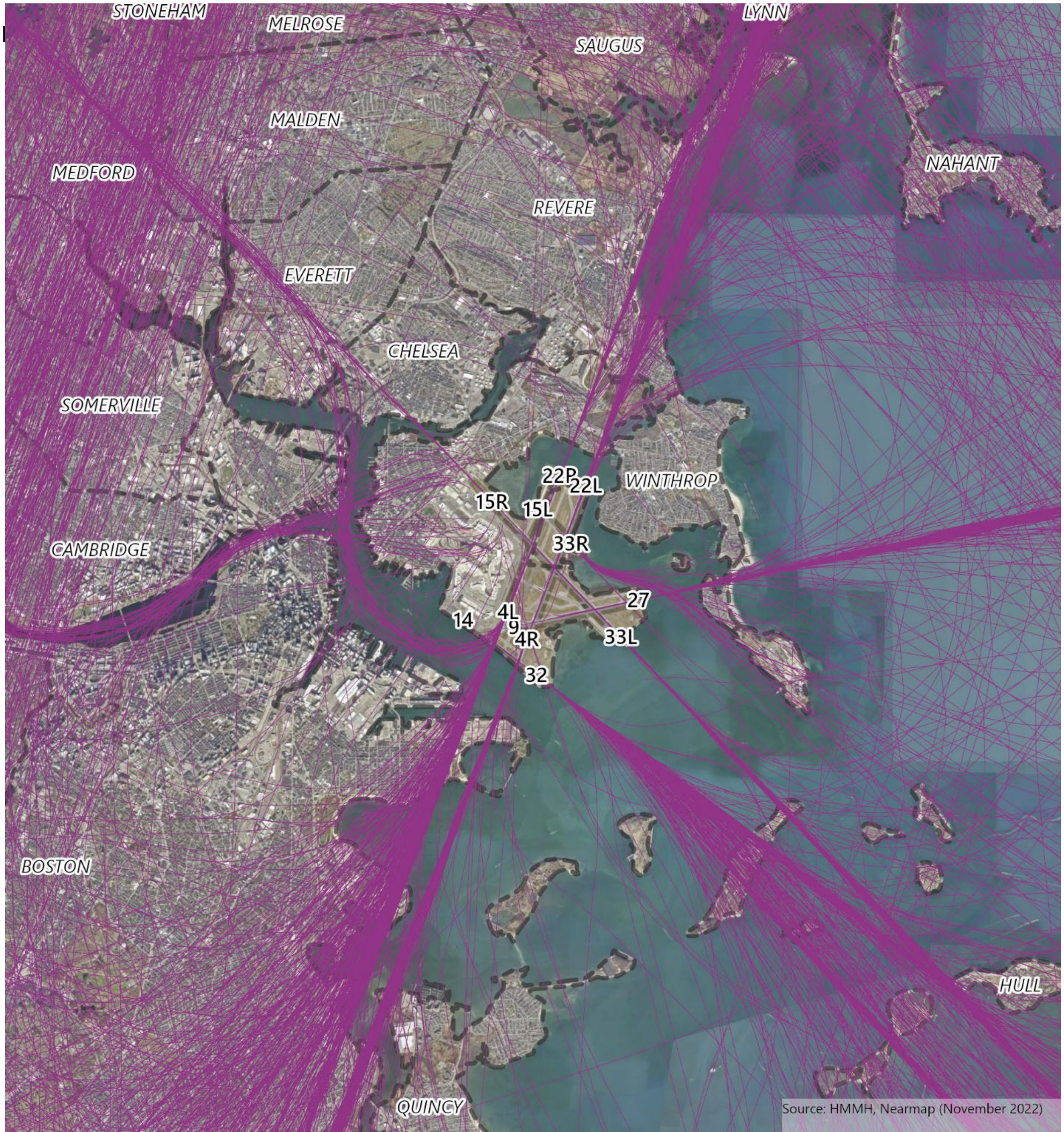


Figure 7-10 Non-Jet Arrivals Flight Tracks

2022 Environmental Status and Planning Report

Non-Jet Arrivals

Municipal Boundary

This figure displays the non-jet departures. Non-jet aircraft tend to turn early off the runways, not following the jet departure routes. Non-jet departures from Runways 4L, 22R, 33L, and 27 are allowed to turn over residential areas, whereas the jet aircraft are not. This also keeps the non-jet aircraft out of the jet departure paths, allowing for efficient jet departures.

0 4,000 8,000 Feet

Figure 7-11 Noise Abatement Night (10PM-7AM) Arrival Flight Tracks to Runway 33L

2022 Environmental Status and Planning Report

RNAV RNP X 33L Approach Arrivals
Light Visual Approach Arrivals
Municipal Boundary

0 4,000 8,000 Feet

7.2.2 Noise Environment in 2022

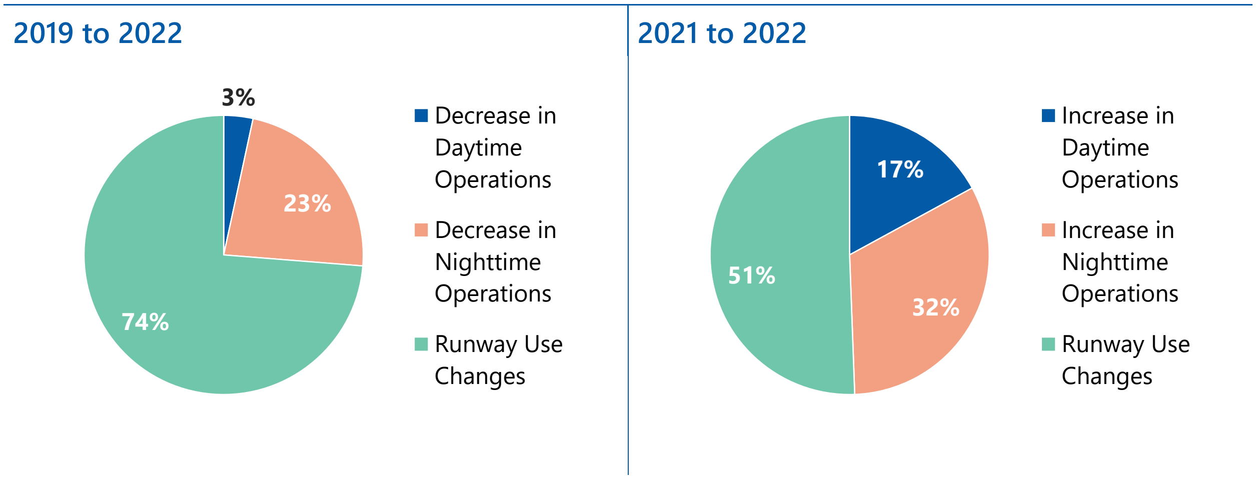
This section describes the results of AEDT noise modeling for 2022. The DNL contours are presented graphically, the population living within contour intervals are tabulated, and DNL values computed by the model for the specific noise monitor locations are compared to the measured noise levels. Historical data are also provided for context. DNL 65 dB is the focus of much of the noise analysis, as it is the threshold for noise incompatibility with residential land use,[19,20] for both FAA and the U.S. Department of Housing and Urban Development (U.S.HUD).

7.2.2.1 Day-Night Noise Contours for 2022

The shape of the DNL contours for 2022 resemble those of 2019 but are smaller in extent.

Compared to 2019, aircraft operations at Logan Airport in 2020 and 2021 were drastically reduced due to the global pandemic. However, 2022 aircraft operations returned to approximately 11 percent below 2019 levels. Some differences in the overall proportion of fleet mix, nighttime operations, and runway use also occurred. **Figure 7-12** shows the relative influence of these factors on changes in the noise contour.

Figure 7-12 Reason for Changes in Number of People Exposed to Day-Night Average Sound Level (DNL) Values Greater than or Equal to 65 dB (2019, 2021, and 2022)



Source: HMMH, 2023.

19 14 Code of Federal Regulations Part 150, Appendix A to Part 150 Noise Exposure Maps, Sec. A150.101(d)).

20 24 Code of Federal Regulations Part 51, Subpart B Noise Abatement and Control, Sec. 51.103(c)).

Figure 7-13 displays the DNL contour set (DNL 60, 65-, 70-, and 75-dB contours) for 2022.

Figure 7-14 shows the DNL 65 dB contours for 2022, superimposed with the previously published DNL 65 dB contours for 2019, 2020, and 2021, calculated with the AEDT software.[21] The general shape of the 2022 contours is similar to the 2019 contours, but the 2022 contour is slightly smaller, due to the 11 percent decrease in operations from 2019.

As noted in the discussion of **Table 7-1** and **Table 7-4**, AAD operations for 2022 were 11 percent less than 2019, resulting in the DNL 65 dB contour being smaller than the 2019 pre-pandemic DNL 65 contour. Because the 2022 operations levels continued the recovery from the pandemic years, the 2022 DNL contours are larger than the DNL contours representing conditions from both 2020 and 2021. The areas of particular interest are where the contour shows change, especially where contour lobes extend over the populated land. These are detailed below, starting on the east side of the Airport, and proceeding counterclockwise.

The collective contour lobe extends eastward over the Point Shirley area of Winthrop indicating that the DNL for 2022 is close to but less than the 2019 levels, which can be attributed to the 2022 operations counts approaching pre-pandemic levels, the use of Runway 9 for departures, and the effective use of Runway 27 for arrivals in 2022 being close to the usage in 2019.

The lobe of the contours that reaches north of the airport into Revere also showed a 2022 return to close to pre-pandemic noise levels, extending over Broad Sound as it did in 2019. This can be attributed to both the return of aircraft operations in 2022 and greater usage of Runway 22L for arrivals than in recent years.

The gap between the 2019 and the 2022 DNL 65 contours over East Boston reflects the lower operations levels in 2022 as well as a slightly lower use of Runway 22R for departures, since that area is most affected by start of takeoff roll noise behind jets on that runway. The contour lobe extending northwest over the Eagle Hill section of East Boston, towards Chelsea for 2022 indicates that noise levels there slightly exceed the pre-pandemic 2019 levels. The lower number of aircraft annual operations in 2022 (as compared to 2019) were counteracted by the increase in effective usage of Runway 33L for departures in that area.

The effective usage of Runway 27 for departures was significantly lower in 2022 than in 2019, which resulted in the contour differences over Boston Inner Harbor.

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21 2019 contours were calculated with AEDT version 3c; 2020 (and 2021) contours were calculated with version 3d, and the 2022 analysis used version 3e. The differences between AEDT versions 3c, 3d, and 3e for noise calculations are minimal, as those updates focused on air pollutant emission methodology rather than noise.

The 2022 DNL 65 contour lobe south of the airport near South Boston resembles the pre-pandemic shape seen in the 2019 DNL contours but is noticeably smaller. This can be attributed to both the fewer operations in 2022 and slightly lower effective usage of Runway 4R for arrivals and Runway 22R for departures in 2022.

The length of the 2022 contour lobe to the southeast over the water along the extended Runway 33L/15R extended centerline has not completely rebounded to the pre-pandemic shape represented by the 2019 contour, due to fewer aircraft operations in 2022.

There is a demonstrated long-term trend of noise level reduction at Logan Airport due to efforts by Massport, airlines, and the FAA, as well as improvements in engine technologies. The nationwide phase-out of Stage 2 operations in 1999 and today's requirements that newly certificated aircraft meet Stage 5 noise levels are two indicators of the continual technological improvements, replacing old aircraft with newer. **Figure 7-15** presents the DNL 65 dB noise contours from 1990, 2019, 2020, 2021, and 2022. Due to the effects of the pandemic on air travel, the 2020 contours are understood to be unusually small; as such, the 2019 contours are more representative of a decade baseline.

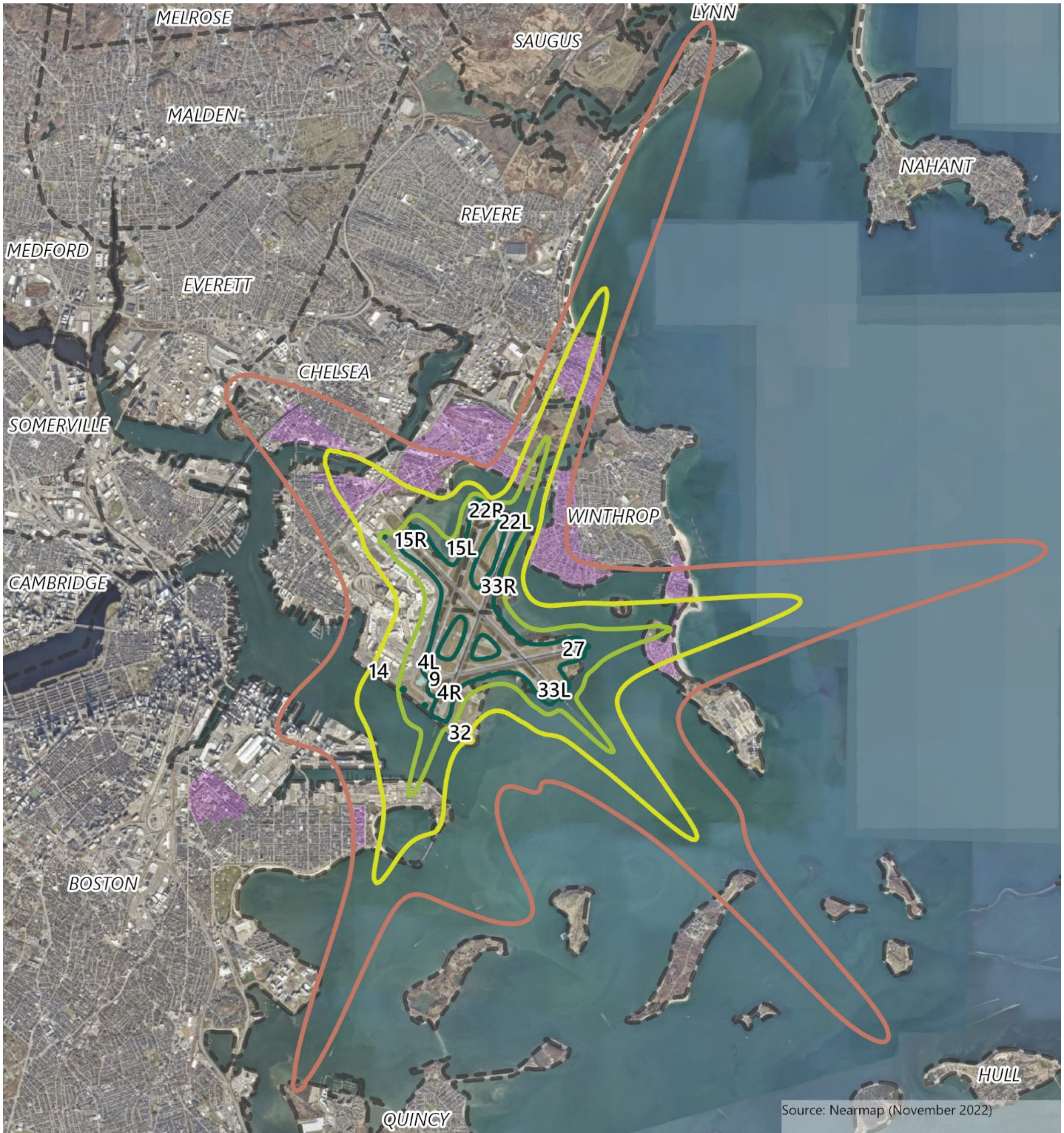


Figure 7-13 60-75 DNL Contours for 2022 Operations Using AEDT 3e

2022 Environmental Status and Planning Report

Figure 7-14 Comparison Between 2019 and 2022 DNL 65dB Contours

2022 Environmental Status and Planning Report

65 dB Contour by Year
2019
2020
2021
2022
Municipal Boundary
Residential Sound Insulation Areas

0 1,800 3,600 5,400 Feet

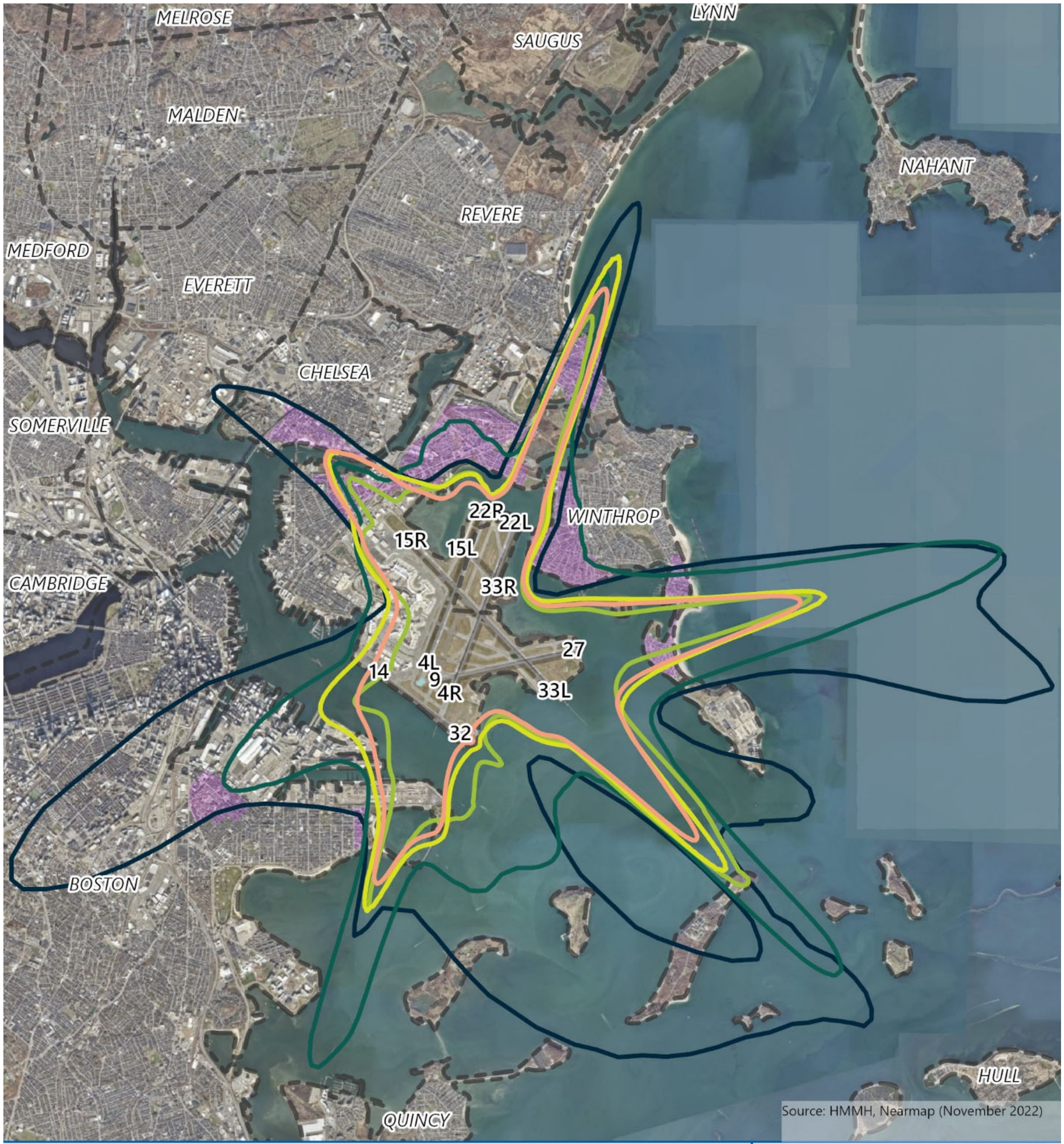


Figure 7-15	Comparison Between 1990, 2000, 2010, 2019, and 2022 DNL 65 dB Contours	2022 Environmental Status and Planning Report

7.2.2.1 2022 Population Counts within Noise Contours

Each year, the EDRs and ESPRs report on population counts within selected 5 dB increments of exposure to indicate how Logan Airport's noise environment changes over time. **Table 7-7** shows population counts for 2022 by noise level and by community, compared to previous years. The 2020 U.S. Census data forms the basis of the population counts for 2020, 2021 and 2022. Population counts from 2010 through 2019 are based on U.S. Census data for 2010, while the counts for 2000 through 2009 were prepared using 2000 U.S. Census data.

The population-counting process determines the fraction of the area of the U.S. Census block that is within the contour and multiplies the block population by this fraction to determine the population exposed to DNL 65 dB or greater for that block. **Table 7-7** provides population results for the contour set for each given year, with the model noted.

Preceding discussions of the comparisons of consecutive years' DNL 65 dB contours (as shown in **Figure 7-13**) detail the contour changes over the populated areas exposed to DNL 65 dB or greater. The population changes seen in **Table 7-7** reflect those contour changes. The estimated population within the DNL 65 dB contour decreased approximately 7 percent from 2019 to 2022, due to the decreased cumulative noise levels resulting from the reduction in aircraft operations. The 2022 DNL 70 dB contour encompasses approximately 27 residents, all within the Winthrop community.

Table 7-7 Population Exposed to DNL 65 dB or Greater, by Community[1]

Year	> 75 DNL	70-75 DNL	65[3]-70 DNL	Total (65+)[3] DNL	Year	> 75 DNL	70-75 DNL	65[3]-70 DNL	Total (65+)[3] DNL
Boston					**Revere**				
1990 (INM)	0	1,778	28,970	30,748	1990 (INM)	0	0	4,274	4,274
1998	58	580	10,877	11,515	1998	0	0	3,168	3,168
2000 (INM)	0	234	9,014[2]	9,248[2]	2000 (INM)	0	0	2,496	2,496
2010 (INM)	0	0	689[2]	689[2]	2010 (INM)	0	0	2,413	2,413
2019	0	7	4,029	4,036	2019	0	0	3,484	3,484
2020	0	0	60	60	2020	0	0	641	641
2021	0	0	885	885	2021	0	0	1,260	1,260
2022	0	0	3,862	3,862	2022	0	0	3,416	3,416

Table 7-7 Population Exposed to DNL 65 dB or Greater, by Community[1]

Year	> 75 DNL	70-75 DNL	65[3]-70 DNL	Total (65+)[3] DNL	Year	> 75 DNL	70-75 DNL	65[3]-70 DNL	Total (65+)[3] DNL
Chelsea					**Winthrop**				
1990 (INM)	0	0	4,813	4,813	1990 (INM)	676	1,211	2,420	4,307
1998	0	0	0	0	1998	519	1,522	6,572	8,613
2000 (INM)	0	0	0	0	2000 (INM)	247	1,070	4,684	6,001
2010 (INM)	0	0	0	0	2010 (INM)	0	130	598	728
2019	0	0	0	0	2019	0	96	1,152	1,248
2020	0	0	0	0	2020	0	0	103	103
2021	0	0	0	0	2021	0	0	352	352
2022	0	0	0	0	2022	0	27	880	907
Everett					**All Communities**				
1990 (INM)	0	0	0	0	1990 (INM)	676	2,989	40,477	44,142
1998	0	0	0	0	1998	577	2,102	20,617	23,296
2000 (INM)	0	0	0	0	2000 (INM)	247	1,304	16,194	17,745
2010 (INM)	0	0	0	0	2010 (INM)	0	130	3,700	3,830
2019	0	0	0	0	2019	0	103	8,665	8,768
2020	0	0	0	0	2020	0	0	804	804
2021	0	0	0	0	2021	0	0	2,497	2,497
2022	0	0	0	0	2022	0	27	8,158	8,185

Source: Massport and HMMH, 2023.

Notes: Population counts for 2020 and later used the 2020 Census data; counts from 2010 to 2019 used 2010 U.S. Census data; counts for 2000 used the 2000 U.S. Census data; counts for 1990 used the 1980 U.S. Census data.

1 The then-current version of the FAA's noise model was used for each analysis: contours for 2016 through 2021 used versions of AEDT; 2015 and prior years used versions of FAA's Integrated Noise Model (INM). Specific model versions and data for years not shown here are available in Appendix I, Section I.3.1.

2 These values reflect the effect of the FAA-approved terrain adjustment in Orient Heights.

3 Day-Night Average Sound Level (DNL) 65 dB is the federally defined noise criterion used as a guideline to identify when residential land use is considered incompatible with aircraft noise

7.2.2.2 2022 Noise Measurement Data

Massport's permanent noise monitoring system consists of 30 noise monitors located around the Airport and environs, as shown in **Figure 7-16**. During normal operation, the noise monitors continuously measure noise exposure levels as well as a variety of metrics associated with individual noise events that exceed preset threshold sound levels. Noise monitoring data are transmitted back to Massport's Noise Office, where daily DNL values and other noise metrics are computed for each location and are summarized in various reports. Noise monitors collect sound data not only from aircraft noise events but also from surrounding noise events such as roadway traffic and construction. Software algorithms identify aircraft noise events which allows Massport to separately calculate total DNL and aircraft only DNL.

Table 7-8 compares the measured 2019, 2021, and 2022 aircraft noise DNL values at each location. The average measured aircraft DNL at the monitoring locations was 56.5 dB in 2019, 55.1 dB in 2021, and 57.7 dB in 2022. This represents an average increase of 0.9 dB from 2019 to 2022.

For 2022, 16 locations[22] had measured average annual DNL values greater than or equal to the corresponding 2019 value, and 12 sites had lower values. The largest difference (of 13.6 dB) is at site 25, where the 2019 result appears to be artificially low. Sites 5, 11, and 21 show the next greatest differences, with 2022 measured DNL higher than 2019 measured DNL by 5.6, 5.4 and 4.4 dB, respectively. The 11 sites with a decrease in measured noise levels as compared to 2019 ranged from 0.1 dB difference to 3.3 dB.

22 A few sites had abnormal readings that seem to indicate equipment malfunction; these are identified in the table end notes. Two sites (1 and 7) had no measured DNL value for 2019.

Figure 7-16 Noise Monitor Locations

2022 Environmental Status and Planning Report

Noise Monitors
Airport Reference Point
Municipal Boundary

0 5,000 10,000 Feet

Table 7-8 Comparison of Measured Aircraft Noise Levels (DNL) From 2019 to 2022

ID	Location	Distance from Airport (miles)	Measured Aircraft Noise Level (DNL)			
			2019	2021	2022	2022-2019
1	South End – Union Park Street Playground	3.7	N/A	N/A	N/A	N/A
2	South Boston – B and Bolton	2.9	58.6	56.3	55.5	(3.1)
3	South Boston – Day Blvd. near Farragut	2.5	63.1*	58.8	61.0	(2.1)
4	Winthrop – Bayview and Grandview	1.6	72.5*	69.7	72.5	0.0
5	Winthrop – Harborview and Faun Bar	1.9	59.2	62.0	64.8	5.6
6	Winthrop – Somerset near Johnson	0.8	64.6	62.7	65.7	1.1
7	Winthrop – Loring Road near Court	1.0	N/A	63.4	66.7	N/A
8	Winthrop – Morton and Amelia	1.6	60.6	58.3	60.7	0.1
9	East Boston – Bayswater near Annavoy	1.3	68.6	66.5	68.2	(0.4)
10	East Boston – Bayswater near Shawsheen	1.3	63.0	60.6	65.9	2.9
11	East Boston – Selma and Orient	1.8	60.2*	57.1	65.6	5.4
12	Coleridge Street, East Boston	1.2	64.2*	62.5	64.4	0.2
13	East Boston High School	1.9	62.9	61.0	62.9	0.0
14	East Boston – Jeffries Point Yacht Club	1.2	57.8*	55.4	57.6	(0.2)
15	Chelsea – Admiral's Hill	2.8	61.9*	60.1	62.6	0.7
16	Revere – Bradstreet and Sales	2.4	70.4	68.2	70.3	(0.1)
17	Revere – Carey Circle	5.3	61.3	59.9	62.2	0.9
18	Nahant – U.S.C.G. Recreational Facility	5.9	38.4	37.5	39.8	1.4
19	Swampscott – Smith Lane	8.7	40.8	40.2	40.0	(0.8)
20	Lynn – Pond and Towns Court	8.4	54.4	52.3	55.0	0.6
21	Everett – Tremont near Prescott	4.5	51.2	52.4	55.6	4.4
22	Medford – Magoun near Thatcher	6.0	54.2	51.4	54.1	(0.1)

Table 7-8 Comparison of Measured Aircraft Noise Levels (DNL) From 2019 to 2022

ID	Location	Distance from Airport (miles)	Measured Aircraft Noise Level (DNL)			
			2019	2021	2022	2022-2019
23	Dorchester – Myrtlebank near Hilltop	6.3	56.3	49.1	53.8	(2.5)
24	Milton – Cunningham Park near Fullers	8.1	49.4	47.5	49.7	0.3
25	Quincy – Squaw Rock Park	4.2	38.9	37.8	52.5	13.6
26	Hull – Hull High School near Channel St.	6.0	59.7	58.4*	59.5	(0.2)
27	Roxbury – Boston Latin Academy	5.3	54.6	52.1	51.3	(3.3)
28	Jamaica Plain – Southbourne Road	7.7	46.4	47.2	46.2	(0.2)
29	Mattapan – Lewenburg School	7.3	37.4	39.9	39.0	1.6
30	East Boston – Piers Park	1.5	50.4	49.5	50.2	(0.2)
Arithmetic Average			**56.5**	**55.1**	**57.7**	**0.9**

Source: HMMH, 2022.
Notes: DNL means Day-Night Average Sound Level; N/A means data not available.
Changes in () represent a decrease in measured noise level.
Site numbers correlate with the **Figure 7-16** map.
Distance from Logan Airport calculated from the Airport Reference Point, which is located along Runway 4L-22R near its intersection with Runway 15R-33L. This location is shown in Figure 7-16.
* Indicates sites with more than 20 days missing from yearly average DNL.
The monitor at Site 1 was removed in May 2017; Massport (in collaboration with the South End community) relocated Site 1 to the Union Park Street Playground in April 2023.
The data collected from Sites 10, 11, and 26 showed signs of equipment malfunction for some of the days; Massport investigated and recalculated DNL manually.
The difference at site 25 correlates to an improved agreement of measured DNL to AEDT-calculated DNL for 2022.

7.2.2.3 Comparing Measured and Modeled 2022 Noise Levels

On an annual basis, Massport reports a comparison of measured noise levels to the computer model results for the specific monitor locations. Differences between measured and modeled values have narrowed over the years as both the noise monitoring and modeling processes have been refined. As shown in **Table 7-9**, for 2022, the difference between the average measured and modeled DNL was 0.1 dB. Of the 30 monitor locations, 16 of the sites recorded higher measured noise levels than the corresponding model-computed noise levels. The agreement between measured and modeled DNL is within 1 dB at eleven of the sites in 2022. The data collected from Sites 10, 11, and 26 showed signs of equipment malfunction on some days; Massport is working with the system vendor to determine the cause of the problem. For those sites, Massport manually recalculated average DNL from the remaining days. It is not unusual to experience larger differences between measured and modeled levels at the locations with measured DNL below 60 dB. At those locations, the monitor identification of aircraft noise events becomes more difficult to differentiate from other noise sources, and long-distance noise attenuation effects can reduce actual levels that the model cannot duplicate.

Table 7-9 Comparison of Measured Aircraft DNL Values to AEDT Modeled DNL Values

Site	Distance to Airport (miles)	2019		2021		2022		Difference: Modeled minus Measured		
		Measured Aircraft – Only DNL	Modeled (AEDT) DNL	Measured Aircraft – Only DNL	Modeled (AEDT) DNL	Measured Aircraft – Only DNL	Modeled (AEDT) DNL	2019	2021	2022
1[3]	3.7	N/A	56.4	N/A	52.2	N/A	52.4	N/A	N/A	N/A
2	2.9	58.6	59.7	56.3	55.5	55.5	56.2	1.1	(0.8)	0.6
3	2.5	63.1*	61.8	58.8	58.0	61.0	60.5	(1.3)	(0.8)	(0.5)
4	1.6	72.5*	71.8	69.7	69.0	72.5	71.2	(0.7)	(0.7)	(1.3)
5	1.9	59.2	64.9	62.0	61.7	64.8	64.6	5.7	(0.3)	(0.2)
6	0.8	64.6	62.4	62.7	60.0	65.7	61.7	(2.2)	(2.7)	(4.0)
7	1.0	N/A	67.3	63.4	63.5	66.7	65.4	N/A	0.1	(1.3)
8	1.6	60.6	62.1	58.3	59.0	60.7	61.2	1.5	0.7	0.5
9	1.3	68.6	68.8	66.5	65.9	68.2	67.9	0.2	(0.6)	(0.3)
10	1.3	63.0	62.8	60.6	59.7	65.9	61.8	(0.2)	(0.9)	(4.1)
11	1.8	60.2*	57.6	57.1	54.6	65.6	56.7	(2.6)	(2.5)	(8.9)
12	1.2	64.2*	66.0	62.5	62.6	64.4	64.7	1.8	0.1	0.3
13	1.9	62.9	63.9	61.0	61.5	62.9	64.2	1.0	0.5	1.3
14	1.2	57.8*	61.8	55.4	58.6	57.6	60.2	4.0	3.2	2.6
15	2.8	61.9*	61.6	60.1	59.1	62.6	61.1	(0.4)	(1.0)	(1.5)
16	2.4	70.4	69.2	68.2	66.7	70.3	68.7	(1.2)	(1.6)	(1.6)
17	5.3	61.3	61.8	59.9	59.1	62.2	61.0	0.5	(0.8)	(1.2)
18	5.9	38.4	45.9	37.5	43.1	39.8	45.0	7.5	5.6	5.2
19	8.7	40.8	45.5	40.2	43.0	40.0	44.7	4.7	2.8	4.7
20	8.4	54.4	56.4	52.3	53.5	55.0	55.5	2.0	1.2	0.5
21	4.5	51.2	55.0	52.4	53.5	55.6	54.8	3.8	1.1	(0.8)
22	6.0	54.2	54.6	51.4	51.5	54.1	53.8	0.4	0.1	(0.3)
23	6.3	56.3	55.9	49.1	53.0	53.8	54.7	(0.4)	3.9	0.9
24	8.1	49.4	54.0	47.5	51.3	49.7	52.9	4.6	3.8	3.2
25	4.2	38.9	50.5	37.8	46.8	52.5	48.9	11.6	9.0	(3.6)

Table 7-9 Comparison of Measured Aircraft DNL Values to AEDT Modeled DNL Values

Site	Distance to Airport (miles)	2019		2021		2022		Difference: Modeled minus Measured		
		Measured Aircraft – Only DNL	Modeled (AEDT) DNL	Measured Aircraft – Only DNL	Modeled (AEDT) DNL	Measured Aircraft – Only DNL	Modeled (AEDT) DNL	2019	2021	2022
26	6.0	59.7	59.7	58.4*	57.9	59.5	58.3	0.0	(0.5)	(1.2)
27	5.3	54.6	54.8	52.1	50.7	51.3	50.9	0.2	(1.4)	(0.4)
28	7.7	46.4	51.6	47.2	47.4	46.2	47.9	5.2	0.2	1.7
29	7.3	37.4	48.6	39.9	44.5	39.0	45.4	11.2	4.6	6.4
30	1.5	50.4	59.0	49.5	55.7	50.2	57.3	8.6	6.2	7.1
Arithmetic		56.5	58.8	55.1	56.1	57.7	57.7	2.4	1.0	0.1

Source: HMMH, 2023.
Notes: DNL – Day-Night Average Sound Level. Modeled results were computed for the full year. N/A – not available.
* Indicates sites with more than 20 days missing from measured yearly average DNL.
1 Site numbers correlate with the **Figure 7-16** map and the addresses listed in Table 7-8.
2 Distance from Logan Airport calculated from the Airport Reference Point, which is located along Runway 4L-22R near its intersection with Runway 15R-33L. This location is shown in **Figure 7-16**.
3 The monitor at Site 1 was removed in May 2017; Massport (in collaboration with the South End community) relocated Site 1 to the Union Park Street Playground in April 2023.
The data collected from Sites 10, 11, and 26 showed signs of equipment malfunction for some of the days; Massport investigated and recalculated DNL manually.

7.2.3 2022 Supplemental Noise Metrics

To further describe the noise environment, this *2022 ESPR* includes supplemental noise metrics: CNI, dwell and persistence, and times above a noise threshold.

7.2.3.1 2022 Cumulative Noise Index (CNI)

Massport reports total annual fleet noise at Logan Airport, as defined in the *Logan Airport Noise Rules (*Noise Rules*)* by a metric referred to as CNI. CNI is a single number representing the sum of the full set of single-event noise energy from each commercial jet aircraft operation (takeoff or landing) at Logan Airport over a full year. CNI is weighted similarly to DNL, meaning an extra 10 dB is added to each event occurring at night. This weighting is equivalent to multiplying the number of nighttime operations by each aircraft by a factor of ten.

The Noise Rules define CNI in units of EPNdB[23] and require that the index be computed for the fleet of commercial aircraft operating at Logan Airport throughout the year. In addition, in EDRs and ESPRs, Massport reports partial CNI values of noise at Logan Airport, so that contributions from various subsets

23 Effective Perceived Noise Level in decibels (EPNdB) is the noise metric used to certify aircraft under CFR Part 36.

of the fleet (cargo, night operations, passenger jets, etc.) are identified. Airline and aircraft registration information from the NOMS allows the proper noise certification levels to be selected from the latest aircraft noise registration database.[24]

The Noise Rules, adopted by Massport following public hearings held in February 1986, established a CNI limit of 156.5 EPNdB. As shown in the top lines of **Table 7-10**, the CNI has decreased since 1990, remaining below the cap, and typical changes from one year to the next have been within a few tenths of a decibel. Since its 2010 minimum of 151.9 EPNdB, the CNI increased moderately through the past decade in response to increases in operations. In 2020, the CNI decreased by 3.2 dB from the 2019 value, in response to the pandemic-induced 52 percent decrease in operations. However, in 2022, as operations rebounded, the CNI was 152.8 EPNdB, remaining 0.7 dB less than the 2019 value of 153.5 EPNdB and well below the Noise Rules limit.

2022 Partial Cumulative Noise Index (CNI) Calculations

The analysis of partial CNI values helps to explain the yearly changes. Partial CNI values are obtained by summing the noise from particular segments of Logan Airport's total operations. **Table 7-10** shows the sectors of the fleet with the highest numbers of partial CNI which generate greater contributions to total noise.

Year-to-year changes can be best understood by examining the subsets of jet operations in **Table 7-10**. Although total CNI dropped in proportion to the decrease in overall operations from 2019 to 2022, the partial CNI from cargo operations increased due to an increase in daytime cargo operations. The number of daytime cargo operations increased by about 33 percent from 2019 to 2022. All other subsets of jet operations had fewer flights in 2022 than in 2019, including nighttime cargo.

Passenger aircraft operations dominate the cumulative noise because passenger flights comprise about 96 percent of commercial jet operations. Nighttime passenger operations contribute more to CNI than daytime passenger operations do because of the tenfold weighting to nighttime noise events in the calculation. Appendix I, Section I.3.2, provides CNI data for 1990 through 2022. and shows the relative contribution of each airline to total CNI.

24 Type-certificate data sheet for noise database available from the European Aviation Safety Agency; http://www.easa.europa.eu/document-library/noise-type-certificates-approved-noise-levels.

Table 7-10 CNI and Partial CNI

	1990	1998	2000	2010	2019	2021	2022	Change (2019 to 2022)
Full CNI (Entire Commercial Jet Fleet)	**156.4**	**154.7**	**154.7**	**151.9**	**153.5**	**151.5**	**152.8**	**(0.7)**
Total Passenger Jets	155.2	153.7	153.6	150.9	153.1	150.9	152.5	(0.6)
Total Cargo Jets	150.1	147.9	148.2	145.1	143.0	142.7	142.2	(0.8)
Total Daytime	152.5	150.4	149.5	146.8	147.7	145.8	147.6	(0.1)
Total Nighttime	154.4	152.7	153.1	150.3	152.2	150.1	151.3	(0.9)
Daytime Passenger	N/A	150.1	149.3	146.6	147.6	145.4	147.4	(0.2)
Nighttime Passenger	N/A	151.2	151.6	149.0	151.7	149.4	150.8	(0.9)
Daytime Cargo	137.1	138.0	137.5	134.5	133.4	134.9	134.3	0.9
Nighttime Cargo	149.9	147.5	147.8	144.7	142.5	142.0	141.4	(1.1)

Source: HMMH, 2023.
Notes: General aviation and non-jet aircraft are not included in the calculation.
1 Data for other prior years prior are available in Appendix I, Section I.3.2.

7.2.3.2 2022 Dwell and Persistence Reporting.

Another supplemental measure of noise impact relates to the length of time for which noise impacts occur. To provide temporary relief to neighborhoods affected by regular overflights during single- or multi-day periods, the PRAS Advisory Committee in 1982 established two short-term goals for the system beyond its annual goals:

- Provide relief from excessive dwell. Exceedance is defined as more than seven hours of operations over a given area during any day between the hours of 7:00 AM and midnight.
- Provide relief from excessive persistence. Exceedance is defined as more than 23 hours of operations over an area between 7:00 AM and midnight during a period of three consecutive days.

In contrast to the annual PRAS goals that counted the number of equivalent operations on a runway, dwell and persistence are measured by the number of hours that a given location or area is subject to jet aircraft overflights. The results of the 2022 Dwell and Persistence reporting are provided in Appendix I, Section I.3.3.

7.2.3.3 2022 Time Above (TA)

The third supplemental noise metric reported in this *2022 ESPR* is the amount of time that aircraft noise is above each of three predefined threshold sound levels. The measure is referred to as TA, and the threshold sound levels used in the analysis are 65, 75, and 85 dBA, like DNL values. These times are computed using the FAA-approved AEDT, using the same inputs as for calculating the DNL contours. The TA computations are made for each of Massport's permanent noise monitoring locations for two timeframes:

- The average 24-hour day during the year
- The average nine-hour nighttime period from 10:00 PM to 7:00 AM.

The threshold sound levels of 65, 75, and 85 dBA reflect different degrees of speech interference depending on factors such as whether people are outdoors, indoors with their windows open, or indoors with windows closed. Appendix I, Section I.3.4 contains more information about speech interference analysis in the Fundamentals of Acoustics and Environmental Noise section. The appendix also presents tables of the AEDT-calculated TA values for 2019, 2021, and 2022 at each of the monitor locations in the Annual Model Results section.

7.3 Future Planning Horizon Noise Environment

Massport applied the Future Planning Horizon operational assumptions (described in the following section) to produce forecast noise contours. 2022 NOMS flight track data were used to develop flight tracks and track use for the forecast case modeling. The resulting noise contours represent Massport's best estimates of future noise levels for when annual passenger counts reach 53.5 million and annual aircraft operations reach 495,000. The following sections present these results along with the associated predicted population impact analysis.

7.3.1 Future Planning Horizon Model Inputs

Inputs for modeling Future Planning Horizon for noise include the following metrics derived from the future forecast described in Chapter 3, *Activity Levels and Forecasting*:

- Annual air passengers (Million Air Passengers or MAP)
- Annual aircraft operations
- Average Annual Day (AAD) aircraft operations
- Aircraft Type
- Aircraft Origin and Destination
- Aircraft Day/Night Schedule
- Assumed Runway Use

These inputs are used in the AEDT version 3e model to develop forecast noise conditions.

7.3.2 Future Planning Horizon Fleet Mix and Operation Assumptions

The Future Planning Horizon developed for Logan Airport includes a predicted 33 percent increase in commercial aircraft operations and a 5 percent increase in GA operations compared to 2022 levels (which were less than pre-pandemic operations). The future forecast fleet, with the passenger level of 53.5 million annual air passengers, includes a larger percentage of newer aircraft (Boeing 787, 737 Max, Airbus 220, and Airbus Neo variants), and 11 percent more RJ operations than the 2022 noise model inputs. The new aircraft types predicted to be in the fleet mix are projected to be more fuel efficient and generate less noise. The projected increase in total operations is 31 percent over the 2022 count. Over the same time period, passengers are projected to increase by 48 percent, continuing the trend of increasing load factors where the growth in passengers outpaces a growth in aircraft operations.

Total operations are expected to increase from almost 1,040 per day in 2022 to over 1,350 per day in the Future Planning Horizon. The total numbers of nighttime operations are expected to increase from 143 in 2022 to 193 in the future planning forecast, due to airline scheduling and accommodation of international time zones. It is expected that the majority of nighttime operations in the future will continue to occur either before midnight or after 5:00 AM.

The forecast assumes that any Stage 3 recertificated aircraft (aircraft that were certified Stage 2 when they were manufactured but were later modified to qualify for Stage 3 certification) would be phased out by this period. The forecast includes some aircraft carrying Stage 3 certification, but all of these would meet the more stringent standards for Stage 4 (44.1 percent of the jet fleet) and Stage 5 (55.9 percent of the jet fleet). **Table 7-11** summarizes the forecast operations by commercial and GA aircraft in comparison to the 2022 fleet.

Table 7-11 Modeled Daily Operations, 2019, 2022, and Future Planning Horizon

	2019			2022			Future Planning Horizon			Percent change (2022-future)
	Day	Night	Total	Day	Night	Total	Day	Night	Total	
Air Carrier Jets	656	174	830	568	123	691	798	171	969	40%
Regional Jets (RJ)	123	12	135	154	13	167	172	14	186	11%
Commercial Non-Jets	124	2	126	95	1	96	112	1	113	18%
Total Commercial Operations	903	188	1,091	817	137	954	1,082	186	1,268	33%
General Aviation (GA) Jets	53	5	58	61	5	66	65	5	70	7%
GA Non-Jets	19	2	21	16	1	18	16	1	18	0%

Table 7-11 Modeled Daily Operations, 2019, 2022, and Future Planning Horizon

	2019			2022			Future Planning Horizon			Percent change (2022-future)
	Day	Night	Total	Day	Night	Total	Day	Night	Total	
Total GA Operations	73	7	79	77	6	84	81	7	88	5%
Total Modeled Operations	976	195	1,170	894	143	1,038	1,163	193	1,356	31%

Source: 2022 data - HMMH and Massport's Noise Monitoring System.
Notes: Totals may not appear to add exactly due to rounding
53.5 MAP forecast data - Massport Long-Range Forecast.

In the Future Planning Horizon the forecast fleet is expected to primarily consist of jet aircraft, resulting in the continued use of the highest-capacity runway configurations. To generate a runway usage table for the future forecast, Massport used recent years' operations counts taken from periods of normal airport operations (i.e., no runway closures), accounting for all seasonal variations.[25] The results were then compared to historical runway usage patterns and adjusted slightly. Although it is challenging to accurately predict a future year's runway usage, Massport has relied on best-available information to develop this estimate. Future ESPR documents will revisit the forecast assumptions using data collected for and reported on in the intervening EDR documents. **Table 7-12** compares the 2022 jet runway use to the future planning forecast jet runway use. Runway use for 2000 and 2010 is also shown in **Table 7-12** for historical context.

Departures for the Future Planning Horizon on Runways 9 and 27 would be higher than in 2022, while departures on Runways 22R and 33L would be lower. Arrivals for the Future Planning Horizon on Runways 4L and 33L are predicted to be higher than for 2022, while use of Runways 22L and 27 is expected to decrease. The resultant forecast runway use resembles the 2022 flight distribution but leans toward historical patterns.

25 The NOMS data for 2018, 2019, 2021, and 2022 were the basis for the forecast runway use.

Table 7-12 Actual and Predicted Jet Aircraft Runway Use

Departures					Arrivals				
Runway	2000	2010	2022	Future Planning Horizon	Runway	2000	2010	2022	Future Planning Horizon
4L	-	-	-	-	4L	4%	5%	2%	3%
4R	8%	4%	4%	4%	4R	40%	28%	28%	28%
9	35%	28%	27%	28%	9	-	-	-	-
14	N/A	<1%	-	-	14	N/A	-	-	-
15L	-	-	-	-	15L	-	-	-	-
15R	4%	8%	5%	5%	15R	1%	1%	1%	1%
22L	3%	2%	2%	2%	22L	7%	15%	33%	31%
22R	30%	31%	33%	31%	22R	-	-	<0.5%	<0.5%
27	15%	10%	6%	10%	27	28%	32%	23%	21%
32	N/A	-	-	-	32	N/A	1%	2%	2%
33L	6%	17%	23%	20%	33L	20%	16%	11%	14%
33R	-	-	-	-	33R	-	-	-	-

Source: HMMH and Massport, 2023.

Notes: Totals may not appear to add exactly due to rounding. N/A for Runway 14-32 in 2000 indicates that the runway was not built yet. Percentages for 2000, 2010 and 2022 are actual jet runway use (as opposed to "effective" runway use which weights nighttime operations); future planning forecast percentages compiled from historical data as described in text.

7.3.3 Predicted Future Planning Horizon Noise Conditions

The following sections describe noise conditions predicted for the Future Planning Horizon and compare these conditions to 2022 and prior years.

7.3.3.1 Future Planning Horizon Day-Night Noise Contours

Figure 7-17 presents a comparison between the 2022 DNL contours and the Future Planning Horizon DNL contours. The area contained within the forecast contours is larger than the area within the 2022 contours due to the expected growth in number of aircraft operations. The total number of nighttime operations for the Future Planning Horizon is expected to increase approximately 35 percent from 2022 levels, while the daytime operations are expected to increase by 30 percent. Runway usage is the controlling factor over the general distribution of noise around the Airport.

Runway usage is the controlling factor over the general distribution of noise around the Airport.

Beginning on the west side of the Airport, and moving clockwise, the contour changes from 2022 to the future forecast are as follows:

- The contour lobe extending southwest beyond the Runway 9 end would be larger in the future forecast case due to the expected fleet mix changes to larger aircraft. Since there would be no arrivals to Runway 9, the contours in that area would be affected only by departures from Runway 27. The Future Planning Horizon DNL 60 dB contour encompasses the Fort Point area of Boston and the DNL 65 dB does not extend into Boston.
- The lobe of the DNL 65 dB contour extending northwest beyond the Runway 15R end would be slightly longer and approximately the same width for the Future Planning Horizon in comparison to 2022, due to decreased Runway 33L departures. The comparison of the DNL 60 dB contours over Chelsea and into Everett displays a similar relationship.
- To the north, the DNL 65 dB future forecast contour would be similar in width and it extends further past the shoreline than the corresponding 2022 contour, due to the increases in aircraft operations. The DNL 60 dB contour reflects the same increases and would extend further into the Point of Pines area of Revere.
- The lobes of the future forecast DNL 65 dB and DNL 60 dB contours would extend eastward over Winthrop would be slightly wider than for 2022 due to increased departures from Runway 9. Arrivals to Runway 27 also contribute to the noise exposure over Winthrop.
- The lobes of the DNL 65 dB and DNL 60 dB contours would extend southeast beyond the Runway 33L end are longer (over Long Island and the tip of Hull) and would be wider in the Future Planning Horizon case than for 2022 due to the overall increase in operations. as Runway 33L arrivals are expected to increase as a percentage of operations.
- Directly south of the airport, the DNL 65 dB contour would be wider for the forecast case than for 2022, and the future forecast DNL 60 dB contour would reach Spectacle Island as an effect of increased aircraft departures from Runways 22R and 22L.
- The lobes of the DNL 65 dB and DNL 60 dB contours would extend south (toward Dorchester and Quincy) would be both wider and longer for the Future Planning Horizon in comparison to 2022, due to increased Runway 4R arrivals.

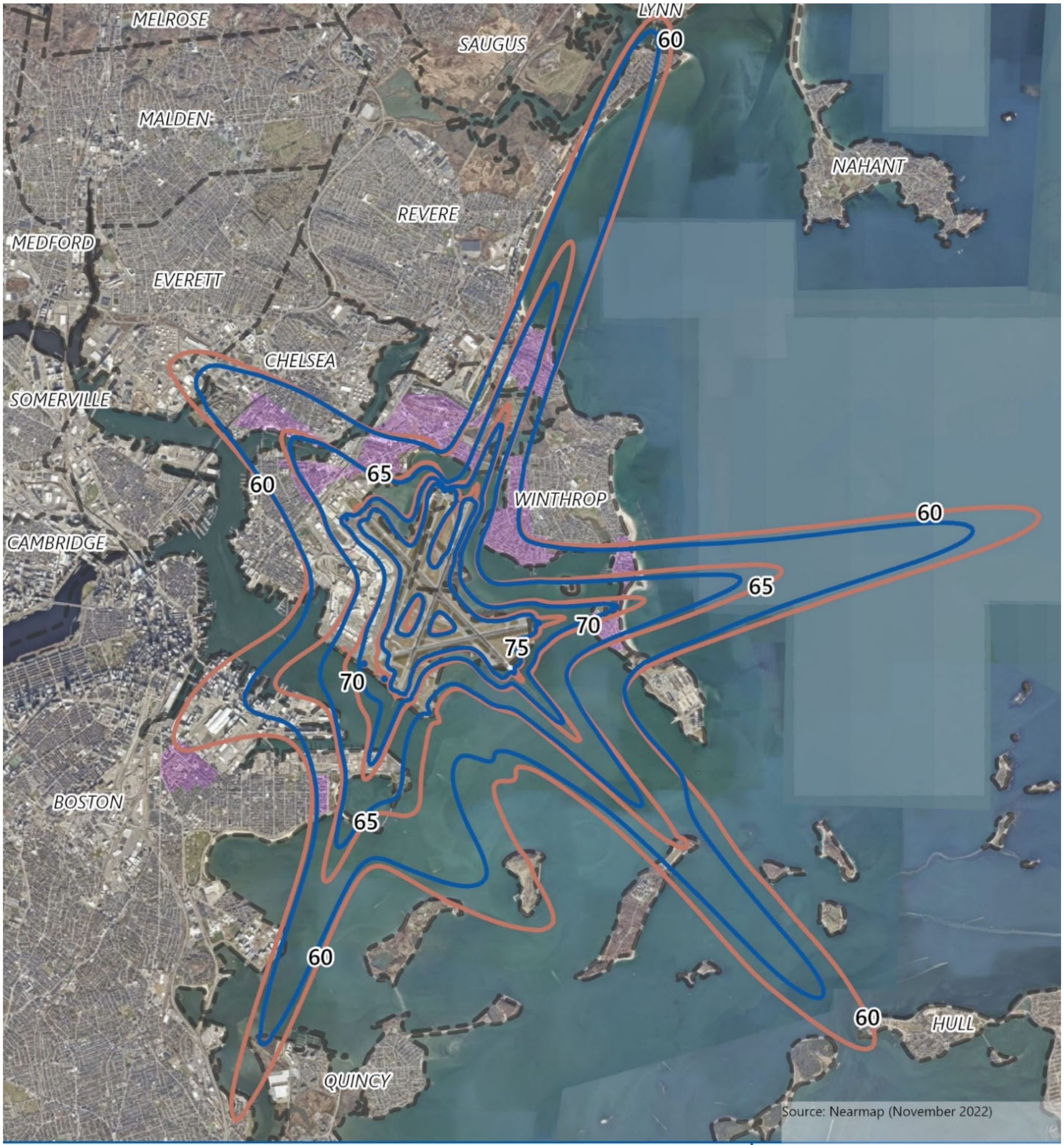
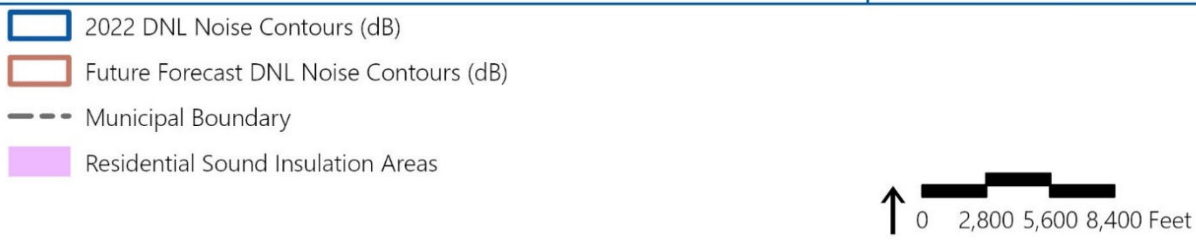


Figure 7-17	Comparison of the DNL 60 - 75 Contours for 2022 and Future Planning Horizon	2022 Environmental Status and Planning Report



7.3.3.2 Modeled Future Planning Horizon Noise-Impacted Population

Population counts by contour interval are summarized in **Table 7-13**.[26] The DNL contours prepared for the anticipated Future Planning Horizon level of aircraft operations in the future forecast result in 9,435 people exposed to noise levels of DNL 65 dB or greater. For comparison, 8,185 people are exposed to noise levels greater than or equal to DNL 65 dB in 2022. The future forecast DNL 65 dB contour remains within areas included in Massport's RSIP.

The future forecast population within DNL 65 dB is significantly less than the 17,745 people exposed to DNL 65 dB or above in 2000.

Table 7-13 also shows that in 2000, a larger number of people were exposed to DNL 70 dB and above than in the future forecast (200 in the forecast compared to 1,551 in 2000). While population exposed to noise levels above 65 DNL are expected to increase 15.2 percent from 2022 to the future forecast, they remain well below historical peaks. As noted earlier, the aircraft in the future forecast fleet are likely to have quieter and more efficient engines than older aircraft in the current fleet, and thus this forecast is conservative. The noise modeling relies on an extensive database of **aircraft noise and performance (ANP)** profiles within AEDT and must use current versions of aircraft as "substitutes" for future types. Therefore, the future forecast DNL contours presented in this chapter are a conservative estimate of the future noise levels. It is expected, with the continued advancement in aircraft technology resulting in quieter engines, that the actual noise levels would be lower. **Figure 7-18** shows the long-term trend in population exposed to levels equal to or higher than DNL 65 dB since 1980.

Table 7-13 Future Planning Horizon Noise-Exposed Population by Community Compared to 2022 and Historical Levels

Year	80+ DNL	75-80 DNL	70-75 DNL	65-70[1] DNL	Total (65+)	Year	80+ DNL	75-80 DNL	70-75 DNL	65-70[1] DNL	Total (65+)
Boston						**Revere**					
1990[3]	0	0	1,778	28,970	30,748	1990[3]	0	0	0	4,274	4,274
2000[3]	0	0	234	9,014[2]	9,248[2]	2000[3]	0	0	0	2,496	2,496
2010[3]	0	0	0	689[2]	689[2]	2010[3]	0	0	0	2,413	2,413
2019	0	0	7	4,029	4,036	2019	0	0	0	3,484	3,484
2021[4]	0	0	0	885	885	2021[4]	0	0	0	1,260	1,260
2022[4]	0	0	0	3,862	3,862	2022[4]	0	0	0	3,419	3,416
Future Forecast[4]	0	0	7	4,402	4,409	Future Forecast[4]	0	0	0	3,880	3,880

26 The 2022 and Future Planning Horizon population counts are based on 2020 U.S. Census data. The 2010 and 2017 counts are based on 2010 U.S. Census data. 2000 counts are based on 2000 U.S. Census data and the 1990 counts are based on 1980 U.S. Census data.

Table 7-13 Future Planning Horizon Noise-Exposed Population by Community Compared to 2022 and Historical Levels

Year	80+ DNL	75-80 DNL	70-75 DNL	65-70[1] DNL	Total (65+)	Year	80+ DNL	75-80 DNL	70-75 DNL	65-70[1] DNL	Total (65+)
Chelsea						**Winthrop**					
1990[3]	0	0	0	4,813	4,813	1990[3]	0	676	1,211	2,420	4,307
2000[3]	0	0	0	0	0	2000[3]	0	247	1,070	4,684	6,001
2010[3]	0	0	0	0	0	2010[3]	0	0	130	598	728
2019	0	0	0	0	0	2019	0	0	96	1,152	1,248
2021[4]	0	0	0	0	0	2021[4]	0	0	0	352	352
2022[4]	0	0	0	0	0	2022[4]	0	0	27	880	907
Future Forecast[4]	0	0	0	0	0	Future Forecast[4]	0	0	193	943	1,136
Everett						**All Communities**					
1990[3]	0	0	0	0	0	1990[3]	0	676	2,989	40,477	44,142
2000[3]	0	0	0	0	0	2000[3]	0	247	1,304	16,194[2]	17,745[2]
2010[3]	0	0	0	0	0	2010[3]	0	0	130	3,700[2]	3,830[2]
2019	0	0	0	0	0	2019	0	0	103	8,665	8,768
2021[4]	0	0	0	0	0	2021[4]	0	0	0	2,497	2,497
2022[4]	0	0	0	0	0	2022[4]	0	0	27	8,158	8,185
Future Forecast[4]	0	0	0	0	0	Future Forecast[4]	0	0	200	9,225	9,425

Source: HMMH, 2023.

Notes: The 1990 population estimates are based on the 1980 U.S. Census data; 2000 estimates are based on the 2000 U.S. Census data; 2010 and 2017 estimates are based on the 2010 U.S. Census data; 2022 and future forecast population estimates are based on the 2020 U.S. Census data.

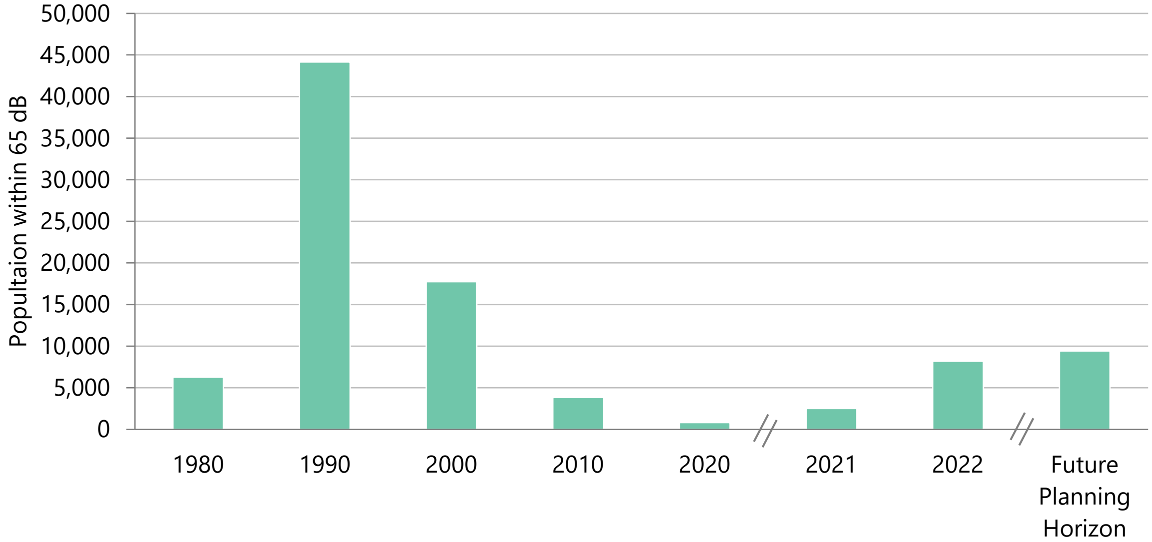
1 Day-Night Average Sound Level (DNL) 65 dB is the federally-defined noise criterion used as a guideline to identify when residential land use is considered incompatible with aircraft noise.

2 These values reflect the effect of the Federal Aviation Administration (FAA)-approved terrain adjustment in Orient Heights.

3 Noise modeled with INM.

4 Noise modeled with AEDT.

Figure 7-18 Future Planning Horizon DNL 65 dB Exposed Population Trend



Source: Massport and HMMH, 2023.

7.3.3.3 Noise Per Seat Index (NPSI)

In the 1990s, Massport developed a metric termed the Noise Per Seat Index (NPSI), which was designed to encourage the reduction of Stage 2 commercial jet aircraft in use at the Airport. The index level was set and then lowered each year. To reach the new level, airlines would switch to newer Stage 3 aircraft on their routes. The index was last set in 1998 because the federal government mandated the phase out of Stage 2 aircraft greater than 75,000 pounds by December 31, 1999. The 2012 FAA Reauthorization bill also mandated the phase out of Stage 2 aircraft with a takeoff weight less than 75,000 pounds by 2015.

The index provides a decibel level per seat, computed by using the number of operations, the number of seats per aircraft, and the certificated noise levels for takeoffs and landings for each aircraft type. For comparison purposes, using this same method, Massport continues to compute and report the NPSI value for all commercial jet operations in each ESPR. These results for 2000, 2011, 2017, 2022, and for the Future Planning Horizon are shown in **Table 7-14**.

Table 7-14 Noise Per Seat Index (NPSI)

Year	Commercial Jet Operations	Average Number of Seats per Aircraft	NPSI (dB EPNL)
2000	306,026	161.7	73.4
2011	283,320	133.1	72.0
2017	325,926	163.0	71.3
2022	313,250	160.5	71.5
Future Planning Horizon	421,567	168.0	71.3

Source: HMMH, 2023

As shown in the table, the average number of seats decreased to 133.1 in 2011, primarily due to the use of RJs and smaller narrow-body aircraft on routes as compared to 2000. Recent trends accommodate more passengers on fewer flights through the use of larger aircraft; this is evidences by the 2017 and 2022 data and is expected to continue, with the average number of seats at 168.0 in the future forecast. The NPSI analysis shows that in the Futre Planning Horizon, even with a higher number of commercial jet operations, the forecast NPSI would be comparable to the 2017 and 2022 values because of the higher average number of seats per aircraft combined with quieter, newer technology aircraft.

7.3.3.4 Historical Context and Trends

Logan Airport noise analyses demonstrate a long-term trend of noise level reduction due to efforts by Massport, the FAA, and improvements in engine technologies such as the nationwide phase-out of Stage 2 operations in 1999 and current requirements that newly certificated aircraft meet Stage 5 noise levels. **Figure 7-19** presents the DNL 65 dB noise contours from 1990, 2000, 2010, 2019, 2022, and the Future Planning Horizon. For historical years through 2022, the contours are based on actual operations data. The predicted contours for the future forecast are based on forecast data prepared for this *2022 ESPR*.

The most important changes in the Logan Airport noise environment, visible in **Figure 7-20**, are the substantial decreases in noise levels, largely attributable to modernization of aircraft fleets whereby the reduction in aircraft noise outweighs noise associated with a growth in operations. As shown in **Table 7-15**, the 1990 noise exposure contours reflected a mix of aircraft operations where almost 50 percent of the jets in the fleet were Stage 2 types and over 40 percent of the overall fleet were non-jet aircraft. The 1990 DNL contours also reflect the prior Runway 27 departure procedure, as the current FAA procedure was implemented in 1996.

Table 7-15 Modeled Average Daily Operations by Commercial and General Aviation (GA) Aircraft

		1990	1998	2000	2010	2019	2022	Future Planning Horizon
Commercial Aircraft								
Stage 2 Jets	Day	312	85	5	0	0	0	0
	Night	20	6	0	0	0	0	0
	Total	332	91	5	0	0	0	0
Stage 3 (or higher) Jets	Day	288	541	727	674	779	722	970
	Night	57	96	104	108	186	136	185
	Total	346	637	831	782	965	858	1,155
Non-Jet Aircraft	Day	444	553	410	139	124	95	112
	Night	12	22	22	5	2	<1	1
	Total	456	575	431	144	126	96	113
Total Commercial Operations	Day	1,046	1,179	1,142	813	903	817	1,082
	Night	89	123	126	113	188	137	186
	Total	1,135	1,302	1,267	926	1091	954	1,268
GA Aircraft								
Total GA Operations	Day	N/A[2]	73	82	36	73	77	81
	Night	N/A[2]	21	6	4	7	7	7
	Total	N/A[2]	94	88	40	79	84	88
Totals	Day	1,046	1,252	1224	849	976	894	1,163
	Night	89	144	131	117	195	144	193
	Total	1,135	1,396	13,55	966	1,170	1,037	1,356

Source: HMMH, Massport NOMS. Massport Long-Range Forecast
Notes: Totals prior to 1998 do not include GA operations.
N/A Not available.

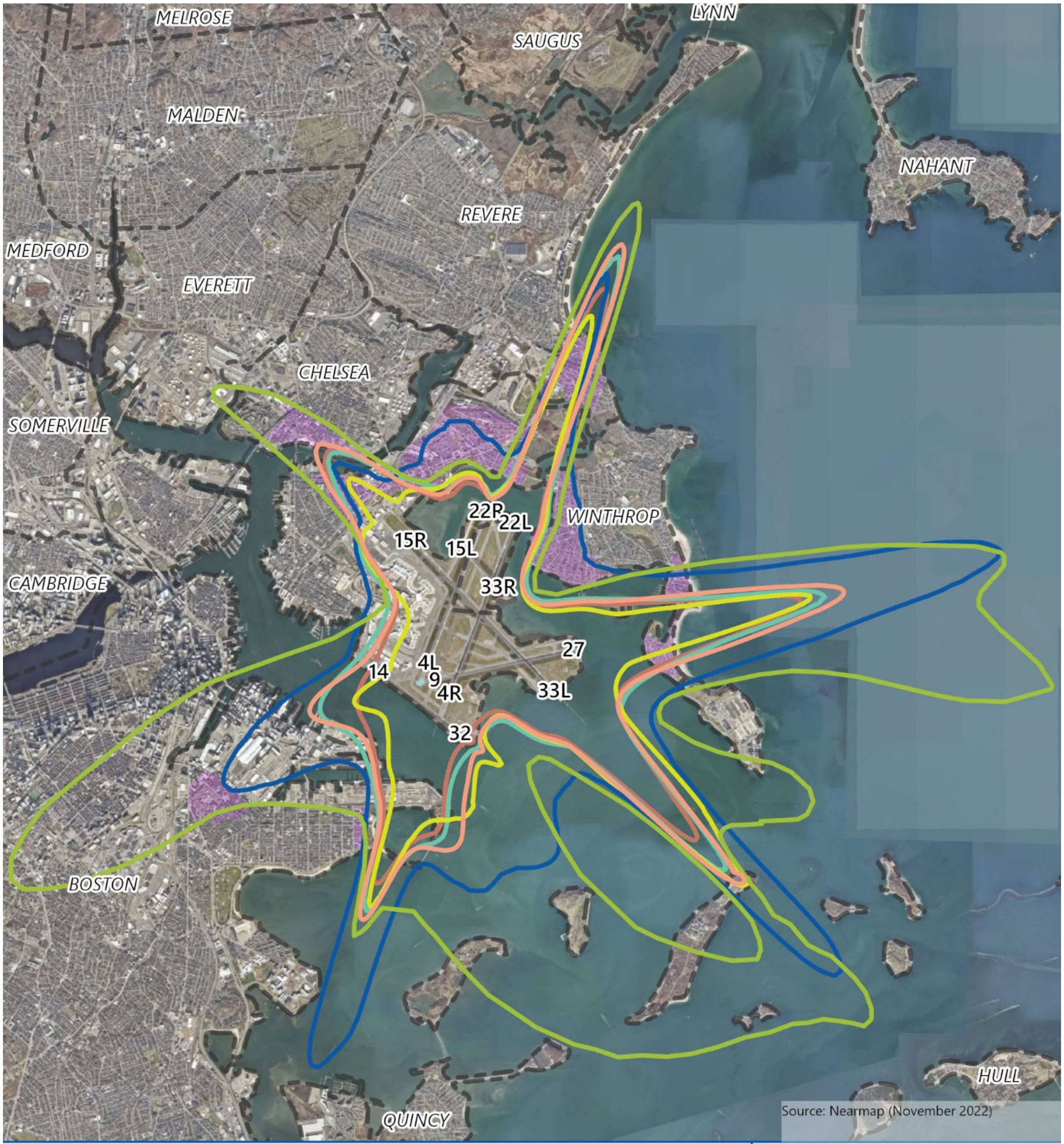
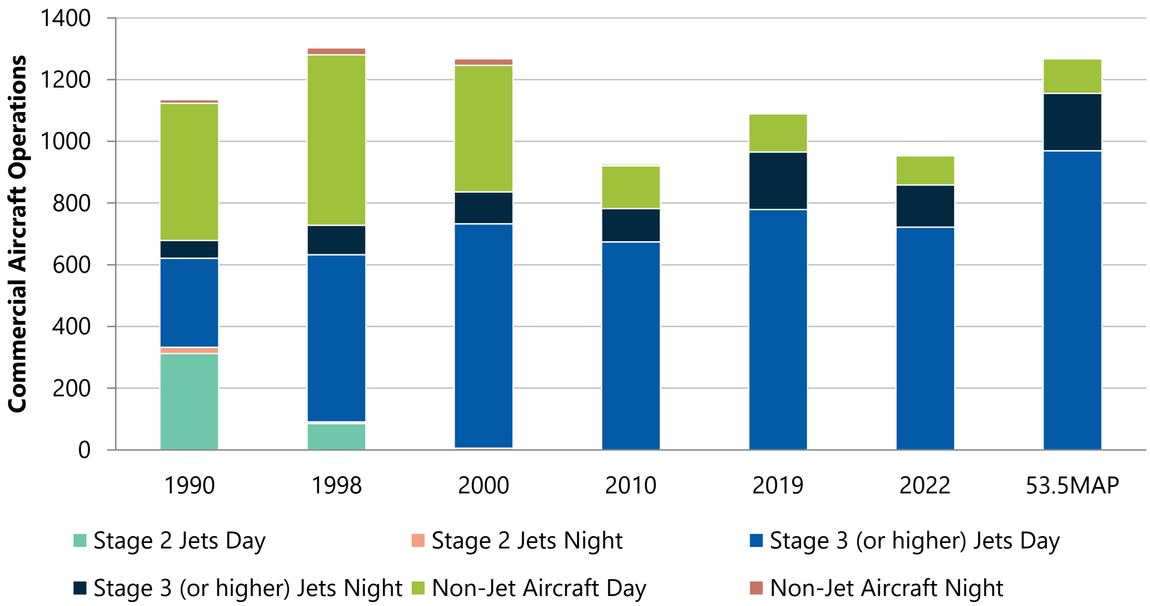


Figure 7-19	Comparison Between 1990, 2000, 2010, 2019, 2022, and Future Planning Horizon DNL 65 dB Contours	2022 Environmental Status and Planning Report

Figure 7-20 Historical Logan Airport Commercial Fleet Mix Comparison



Source: HMMH

7.4 Noise Abatement Management Plan

Massport achieves its noise abatement goals through the implementation of multiple elements. **Table 7-16** lists these goals and the associated plan elements and reports on progress toward achieving these goals.

Table 7-16 Noise Abatement Management Plan

Noise Abatement Goal	Plan Elements	2022 Progress Report
Limit total aircraft noise	Limit on Cumulative Noise Index (CNI)	The CNI value for 2022 was 152.8 EPNdB which is well below the cap of 156.5 EPNdB.
	Stage 3 percentage Requirement in Noise Rules	In 2022, 100 percent of Logan Airport's total commercial jet traffic satisfied Stage 3 noise criteria or better. The newest Stage 5 category comprised about 34 percent of these operations.
Mitigate noise impacts	Residential Sound Insulation Program (RSIP)	No additional dwelling units were sound insulated in 2022, leaving the total of treated dwelling units at 11,515 since the start of the program in 1986, with over $170 million invested. See Appendix I, Section I.4.1, for additional details. In 2022, Massport re-started its RSIP, applying for and receiving an initial grant from FAA to fund the beginning phase of the new program.

Table 7-16 Noise Abatement Management Plan

Noise Abatement Goal	Plan Elements	2022 Progress Report
	School Sound Insulation Program	Thirty-six eligible schools have been sound insulated since this program began.
	Noise Abatement Arrival and Departure Procedures	Flight track monitoring and data analysis were used to verify adherence to noise abatement flight procedures. See Appendix I, Section I.4, for data from the 2022 Monitoring Reports.
	Preferential Runway Advisory System (PRAS) Runway End Use Goals	Massport continues to report on effective runway use and compare the results to PRAS goals despite the program no longer being in effect.
	Runway Restrictions	Noise-based use restrictions 24 hours per day on departures from Runway 4L and arrivals on Runway 22R were continued.
	Reduced-Engine Taxiing	Voluntary use of reduced-engine taxiing (shutting one engine off) is encouraged when appropriate and safe.
Continue to Improve the Noise Monitoring System	Evaluate current system and update system as needed	Massport replaced all 30 permanent noise monitors in the past 3 years. In 2024, at the end of the current support contract, Massport will select a contractor for system upgrade and ongoing support.
Minimize nighttime noise	Nighttime Stage 2 Aircraft Prohibition	With the FAA's ban on all Stage 2 operations after December 31, 2015, this prohibition is no longer necessary.
	Nighttime Runway Restrictions	Prohibitions on use of Runway 4L for departures and Runway 22R for arrivals between 11:00 PM and 6:00 AM were continued in 2022.
	Maximization of Late-Night Over-Water Operation	Efforts to maximize late-night over-water operations were continued. Preferential use of Runway 15R for departures and Runway 33L for arrivals continued.
Minimize nighttime noise (continued)	Nighttime Engine Run-up and auxiliary power unit (APU) Restrictions	Restriction on nighttime engine run-ups and use of APUs was continued.
Address/respond to noise issues and complaints	Noise Office	Massport's Noise Office was established in 1977. Noise Office staff participate in all elements of Logan Airport's noise abatement efforts.
	Noise Complaint Line and website	Massport continued operation of its Noise Complaint Line, (617) 561-3333 and website (https://www.massport.com/logan-airport/about-logan/noise-abatement/complaints/).

Table 7-16 Noise Abatement Management Plan

Noise Abatement Goal	Plan Elements	2022 Progress Report
	Special Studies	Massport continued to provide technical assistance and analysis using noise monitoring systems to support the FAA and others in monitoring jet departure tracks from Runway 27 and Runway 33L. Massport and the FAA completed an Area Navigation (RNAV) evaluation project in 2021 designed to identify ways to reduce noise from the RNAV procedure (which concentrates flights). Massport is working with the Aviation Sustainability Center (ASCENT) on two research project concerning aircraft noise and flight procedures. Massport continues to support research at the federal level including Boston University/Tufts University FAA ASCENT research.

Source: Massport, 2022.

Massport's noise abatement program continues to play a critical role in helping to limit and monitor noise impacts. Massport's emphasis on noise abatement has focused on the benefits of better analysis tools, involvement in noise research projects, and improved modeling techniques to identify the causes of noise problems. Massport also continues to coordinate with FAA and the Massport CAC on matters related to runway use and the ongoing RNAV Pilot project.

Massport's NOMS, installed in 2008, includes extensive analysis and mapping capabilities, the latest FAA NextGen radar data feed, use of multilateration radar (a separate and unique source of operational data), improved noise complaint handling, and direct correlation of noise events with radar flight paths and complaints (a feature that the prior system did not have). This latter capability has improved the ability of the system to differentiate between aircraft and community noise sources. All measured data and complaint information in this report were generated through the NOMS. Another important feature of this system is the public flight tracking interface which allows the public to view, identify, and report aircraft operations to Massport. Massport evaluated the current system in early 2018 and went out to bid for an upgraded NOMS in late 2018. The prior vendor L3Harris was selected and in 2019, L3Harris began upgrading the system and the option for Virtual Noise Monitors (VNM). Massport completed replacing the equipment for 29 permanent noise monitors in 2021 and, in collaboration with the South End community, identified a preferred location for Site 1. The new site 1 was operational in April 2023.

The Logan Airport noise mitigation program includes operational restrictions on certain runways, limits to engine runup locations, late night runway preference, and noise abatement turns. Other continuing elements of Massport's noise mitigation program are discussed below.

7.4.1 Residential Sound Insulation Program

In accordance with FAA requirements, Massport has one of the most extensive residential and school sound insulation programs in the nation. To date, Massport has installed sound insulation in 5,467 residences, including 11,515 dwelling units, and 36 schools in East Boston, Roxbury, Dorchester, Winthrop, Revere, Chelsea, and South Boston. Historically, the percentage of eligible homeowners who have responded and whose dwellings are treated varies significantly by community from a high of approximately 90 percent in Revere to a low of approximately 50 percent in South Boston. Approximately 80 to 85 percent of homeowners in East Boston and Winthrop have historically participated. Approximately 8 percent of applicants also choose the Room of Preference option that allows the owner to identify a room (usually a bedroom or living room) for extra acoustical treatment.

Eligibility for sound insulation must follow FAA guidelines which state that the residence must be located within the latest DNL 65 dB contour submitted to the FAA and a noncompatible structure must be experiencing existing interior noise levels within habitable rooms that are 45 dB or greater with the windows closed to be considered eligible.[27] Also, structures constructed after October 1, 1998 are not eligible and structures that do not meet building codes are not eligible until the building's deficiencies have been addressed. The FAA will allow a residence to be treated under the sound insulation program one time; homes treated previously after 1993 are not eligible for additional consideration.[28]

In January 2020, Massport's Chief Executive Officer (CEO) sent a letter to the FAA Associate Administrator requesting that Massport and the FAA work together to address re-treatment of homes that were sound insulated during the early years of the program, potentially upgrading treatments in eligible homes with newer, more effective, and more durable materials. The Associate Administrator responded that the FAA was exploring limited circumstances under which Massport might be able to re-assess homes that had been mitigated before the FAA first issued sound insulation standards in 1993. The first step in this process was for Massport to submit an updated RSIP NEM.

Massport submitted an AEDT-derived 2019 NEM to FAA in 2020 for review and discussion. At that time, the FAA had requested that the updated sound insulation program contour represent 2019 operational conditions due to the significant reduction in aircraft operations in 2020 resulting from the COVID-19 pandemic. It was subsequently determined by FAA that a 2020 NEM would be more appropriate. It is recognized that as air traffic activity rebounds, the DNL contours will grow and Massport will update subsequent NEMs so that the RSIP will continue to be based on the latest Logan Airport noise environment.

FAA accepted the 2020 NEM on December 20, 2021, and Massport re-started its RSIP in 2022. Massport selected a consulting team who will survey eligible program areas to identify potentially eligible properties that meet the FAA's new criteria for a pilot program. In 2022, Massport applied for and was approved for an

27 FAA Airport Improvement Handbook, Appendix R.

28 FAA Airport Improvement Handbook, Table C-5 Item (8), page C-19.

initial grant by the FAA to fund the beginning phase of the RSIP program. Appendix I, Section I.4.5 contains data on the residential buildings, dwelling units, and schools which have been sound insulated by Massport.

7.4.2 Massport Noise Complaint Line

Table 7-17 presents a summary of noise complaints received by the Massport Noise Abatement Office. The summary table presents the fifteen communities with the greatest number of complaints for 2022, along with the number of callers and the corresponding numbers from 2019 through 2021. The communities listed in the table represent 97 percent of the complaints in 2022. All remaining communities are summed together into a single line above the grand total. Appendix I, Section I.4.2, has a full listing of the complaints by community.

In 2022, Massport received 272,943 noise complaints from 80 communities, an increase of about 1.4 percent as compared to the 268,929 complaints received from 86 communities in 2019. The community of Winthrop generated about 31 percent of the complaints in 2022 (but only 3.5 percent in 2019). The community of Medford, with 16 percent of the callers[29] in 2022, had the most individual callers as well as the second highest number of complaints. In 2019, there were more than three times as many individual callers from Medford (and twice as many individual callers overall). The total number of individual callers was 1,301 callers in 2022, as compared to 2,669 callers in 2019.

Continued technological advances in both Massport's noise complaint phone system and online complaint tracking system, as well as the incorporation of third-party complaint applications, have made it easier for community members to file a complaint and to receive information about particular noise events.

In late 2018, Massport's complaint tracking system began identifying complaints that were submitted through the new Airnoise online button.[30] The ability to easily submit a complaint has dramatically increased the number of complaints[31] logged in the system. Prior to 2018, the average number of complaints per individual caller (the ratio of complaints to callers) varied from about 10 to 17 each year. In 2019 the average number of complaints per individual caller was just over 100; in 2022, it was almost 210.

The FAA launched its nationwide Noise Complaint Initiative (NCI) in 2020 to better engage with communities on noise complaints. This initiative allows the public to submit a noise complaint or inquiry through the FAA Noise Portal, enabling the FAA to direct or respond to noise complaints more efficiently

29 For clarity, the people logging the complaints are referred to here as "callers" despite most complaints arriving electronically (as opposed to by telephone calls).

30 Airnoise is a subscription service that allows the user to file a noise complaint by clicking an online button. The system finds the aircraft closest to the complainer and then files a detailed noise complaint directly with Massport. https://www.airnoise.io/

31 In 2020, 82 percent of complaints were logged through Airnoise; in 2021, almost 87 percent of the complaints were logged that way.

and effectively. Massport is a Partnering Airport with the FAA's Noise Portal,[32] and has a link to that portal on the noise complaint section of the Massport website.[33]

Table 7-17 Noise Complaint Line Summary

Town	2019		2021		2022		Change in Complaints
	Complaints	Callers	Complaints	Callers	Complaints	Callers	2019 to 2022
Winthrop	8,121	201	54,166	85	84,748	103	76,627
Medford	98,021	712	102,182	210	73,912	211	(24,109)
Somerville	28,070	229	26,565	108	40,372	155	12,302
Milton	41,575	219	17,454	77	17,420	110	(24,155)
Arlington	7,021	77	10,017	30	11,276	58	4,255
Revere	291	95	12,389	29	10,200	27	9,909
Winchester	9,143	15	15,329	19	8,466	9	(677)
Watertown	3,709	28	2,710	18	3,661	28	(48)
South End	5,309	27	359	14	3,347	7	(1,962)
Malden	15,414	34	6,324	24	3,265	9	(12,149)
Marblehead	1,291	14	2,742	16	2,807	6	1,516
Roxbury	5,151	24	3,548	21	1,586	6	(3,565)
Woburn	387	8	846	9	1,346	5	959
Cambridge	1,958	142	629	50	1,214	68	(744)
Chelmsford	1,931	2	1,201	3	1,093	1	(838)
Totals (for towns listed above)	227,392	1,827	256,461	713	264,713	803	37,321
Totals from other towns	41,537	842	13,406	491	8,230	498	(25,296)
Overall Totals	268,929	2,669	269,867	1,204	272,943	1,301	4,014

Source: Massport, 2023.

Notes: "Callers" data tracks individual complainants, although complaints are usually submitted online. Changes in parentheses () represent a decrease in noise complaints.

The top fifteen communities for 2022 are listed above. The complete list of complaints is in Appendix I, Section I.4.2. In late 2018, Massport added the option to submit complaints through the Airnoise button, which has dramatically increased complaints logged in the system

32 Federal Aviation Administration. FAA Noise Portal. https://noise.faa.gov/noise.

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

7.4.3 Other Massport Noise Initiatives

Massport develops and publishes annual noise contours (**Figure 7-13** presents contours for 2022). Massport's website features a web-based flight tracking system known as PublicVue.[34] The PublicVue site allows the user to view flight tracks in near-real time, replay flight tracks, and enter noise complaints.

The Noise Office uses summary reports of operations by airline, runway, aircraft type, and other parameters to help track potential changes in the noise environment. Refer to Appendix I, Section 1.3.

Massport, in an advisory role, participated in the completed FAA BLANS process, which designed RNAV departure procedures off most runways to avoid highly populated areas and the use of an over-water visual approach at night to keep aircraft offshore as much as possible.

Massport supports the Massport CAC, a state-legislated body that works with Massport on a range of Authority-wide topics, including environmental issues. Further information about the Massport CAC can be found at http://massportcac.org/.

Massport encourages the use of reduced-engine taxiing whenever possible and encourages the vortex generator retrofit of the Airbus A320 family.

Massport strives to participate in research to reduce community noise levels whether through the Airport Cooperative Research Program (ACRP) or with FAA, such as the recently completed RNAV Pilot project.

In 2022, Massport completed an innovative study with the MIT and FAA which evaluated PBN procedures and possible airspace changes as part of a memorandum of understanding (MOU) signed in 2016. Two measures from the first phase of this study were implemented in 2022 and two additional measures were implemented in 2023. The FAA's letter to Massport "sunsetting" the MOU is included in Appendix I, Section I.4.5.

Massport is a member of the Aviation Sustainability Center (ASCENT), which is a coalition of 16 leading U.S. research universities and over 60 private sector stakeholders (including Massport) committed to reducing the environmental impact of aviation. Massport is actively participating in two research initiatives on aircraft noise.[35]

7.4.4 Noise-Related Efforts by Others

The next sections discuss various initiatives and studies conducted by the FAA and Massport to improve airport operations and reduce noise impact. A federal Environmental Assessment (EA) prepared by FAA evaluated a permanent RNAV Runway 4L approach procedure to improve landing during reduced weather conditions. Massport requested the FAA to review and implement two procedures at Logan Airport to shift departures away from populated areas. The use of single- or reduced-engine taxiing was

34 Massport. Flight Monitor. http://www.massport.com/logan-airport/about-logan/noise-abatement/flight-monitor/.

35 Ascent. Massachusetts Port Authority. https://ascent.aero/participant/massachusetts-port-authority/.

explored as a potential noise reduction method, but it was not widely adopted due to safety and practical reasons. The FAA, academia, and other entities are conducting ongoing noise studies to understand the impact of aircraft noise on communities and explore alternative noise metrics. Massport is also keeping abreast of international research on the effects of aircraft noise.

7.4.4.1 FAA Runway 4L RNAV Approach Environmental Assessment (EA)

The FAA proposed an improved approach procedure to Runway 4L, which previously was only available during visual weather conditions. The goal of implementing the RNAV was to allow Runway 4L to be available for arrivals during some reduced-visibility weather conditions. The procedure was originally evaluated in 2015 during a temporary test and the FAA committed at that time to conduct a federal EA. The *2015 EDR* reported on the test and evaluation.

The FAA EA evaluated a permanent RNAV Runway 4L approach procedure to provide a de-conflicted stabilized approach procedure that provides vertical and lateral guidance when weather or winds require aircraft to land on Runway 4L. The FAA began this process in October 2019 and provided a status presentation to the Massport CAC during its January 2020 meeting. The Draft EA was available for public review and the FAA held public workshops in October 2020. A Finding of No Significant Impact (FONSI) was issued in May 2022 along with the Final EA report.[36,37] The procedure was published in November 2022 and is now in use.

7.4.4.2 Memorandum of Understanding (MOU) Pilot Study Procedures

As an outcome from Block 1 of the RNAV Pilot project, Massport submitted a request to the FAA for review and implementation of two procedures at Logan Airport. These include modifying the existing RNAV Standard Instrument Departures (SID) from Runway 15R to shift departures further north over water away from Hull, and a new over-water Required Navigational Performance (RNP)[38] approach to Runway 33L. The FAA completed development of these procedures and published the procedures in December 2021. Thus, 2022 represents the first full year of use for the procedures.

FAA's new RNP approach to Runway 33L is also designed to keep traffic out over the water and away from densely populated areas. The initial RNAV study Block 1 recommendation was for FAA to convert the jetBlue Special RNAV Visual Approach to a published RNAV Visual Approach that all airlines could use. After further review and analysis, it was decided that an RNP approach would be better, and it could be used day or night. The procedure is referred to as RNAV (RNP) X RWY 33L Approach.

36 U.S. Department of Transportation. Final Environmental Assessment, Boston Logan RNAV (GPS) RWY 4L. https://www.faa.gov/air_traffic/community_engagement/bos/media/Full-Final-EA-with-Appendices.pdf.

37 U.S. Department of Transportation. Federal Aviation Administration. Finding of No Significant Impact and Record of Decision, Boston Logan RNAV (GPS) RWY 4L Environmental Assessment. https://www.faa.gov/air_traffic/community_engagement/bos/media/Final-EA-with-Appendices.pdf.

38 (RNP) is a family of navigation specifications which allow aircraft to operate along a precise flight path.

An outcome of Block 2 of the RNAV project is a new RNAV/RNP approach to Runway 22L and modifications to the Runway 22L/R RNAV SID to shift departures further north away from Hull. Both of these procedures were implemented in Nov 2023.

7.4.4.3 Reduced-Engine Taxiing

Single-engine or reduced-engine taxiing has the potential to reduce noise at Logan Airport. When used, the largest noise benefit is achieved by reducing the use of the engines on the side of the aircraft closest to the community. However, this is not always practicable due to airline procedures, taxiway routings, and safety considerations. Massport has reached out to the airlines and encouraged the use of this procedure whenever practicable. A copy of Massport's letter to pilots, reminding them of the single-engine taxi recommendation, is shown as **Figure 7-21**.

In 2009, MIT, in cooperation with Massport and the FAA, conducted a survey of pilots at Logan Airport and found that the procedure was widely used on arrivals but not frequently used on departures.[39] Key reasons cited for not using the procedure were safety related or practical reasons such as a short taxi time. The survey indicated that for the procedure to be considered for arrivals, the taxi-in time would have to exceed 10 minutes and for departures, exceed 20 minutes.

The average taxi-out times for Logan Airport, which exceed 20 minutes historically occurred during two periods of the day: in the early morning and in the evening. During 2022, average taxi-out times only exceeded 20 minutes from 7:00 AM. to 9:00 AM, and from 5:00 PM to 9:00 PM. This is consistent with the average taxi-out times for 2019. Historically, the average taxi-in time did not exceed 10 minutes. However, in 2019, it was exceeded during the 6:00 to 8:00 PM period. In 2022, average taxi-in times exceeded 10 minutes from 6:00 to 7:00 AM and from 6:00 to 9:00 PM.

The average taxi-out time at Logan Airport was 19.4 minutes in 2019 and 17.8 minutes in 2022. The average taxi-in time was 8.6 minutes in 2019 and 8.5 minutes in 2022. Overall, the average taxi/delay time decreased from 14.0 minutes in 2019 to 13.1 minutes in 2022.[40]

Mandatory single engine taxiing was also one of the proposed measures in the BLANS but the FAA rejected them due to safety concerns. The voluntary process remains in effect.

39 The full report was published in the 2009 EDR in Appendix L, Survey of Airline Pilots Regarding Fuel Conservation Procedures for Taxi Operations.

40 FAA Aviation System Performance Metrics: Avg. Taxi Time: Standard Report.

Figure 7-21 Massport Letter to Pilots on Single Engine Taxiing

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

To: Boston Logan Air Carriers, Chief Pilots

From: Edward C. Freni
Director of Aviation

Date: August 7, 2023

RE: Update on Strategies to Reduce Aircraft-Generated Emissions and Noise at Boston Logan and Massport's Net Zero Plan/Sustainable Aviation Fuels

I am writing to you on our long term goals of reducing environmental impacts and tackling aviation's contribution to climate change. Airlines and airports across the US and the world have established goals and announced initiatives to reduce emissions, de-carbonize aviation operations, and make our industry more sustainable. As we previously mentioned, this includes Massport's Net Zero Initiative to achieve net zero carbon on Massport related emissions by 2031, our 75th anniversary.

Airlines, including many serving Boston Logan, have announced initiatives to buy and use Sustainable Aviation Fuels (SAF) as a critical strategy to reducing carbon emissions. The industry, including Massport has successfully advocated for new federal policy to support the production of SAF. Massport, as part of our Net Zero Plan, is also looking for ways to partner with you on this critical industry initiative, as well as other airports. I want to thank you for your support to electrify GSE equipment at Boston Logan, as well as your support for our investments in greener facilities and onsite solar.

I also want to recognize efforts to reduce noise and emissions that impact our nearby communities. Successful strategies include:

- Utilizing single or reduced-engine taxiing saving fuel and reducing emissions-subject to pilot discretion and consistent with operational safety.
- Use of idle reverse thrust (or to minimize the use of reverse thrust) on landing, as a second operational measure, again, at the discretion of the pilot and consistent with your safety procedures.

Thank you for your continued work to enhance Boston Logan's operational safety and efficiency, while reducing its environmental footprint. If you have any questions or would like to discuss any aspect of this letter, please feel free to contact me or Mr. Flavio Leo, Director of Planning and Strategy, at 617-568-3528.

Edward C. Freni
Director of Aviation

7.4.4.4 Ongoing Noise Studies

Massport keeps up to date with noise related studies and requirements undertaken by the FAA, academia, and other entities. As part of the October 2018 FAA Reauthorization, FAA was directed to address issues related to aviation noise research including:

- Sec. 173. Alternative Airplane Noise Metric Evaluation Deadline: Requires FAA to complete research on alternative noise metrics as a possible replacement to DNL within one year. FAA forwarded its Report to Congress in April 2020 as described under the Noise Metrics section above. FAA is considering how these findings will be used.
- Sec. 187. Aircraft Noise Exposure: Requires that the FAA complete "ongoing review of the relationship between aircraft noise exposure and its effects on communities" within two years. It specifically requires FAA to revise its Part 150 land use compatibility guidelines (14 CFR 150). The Neighborhood Environmental Survey (NES) was released in January 2021. The FAA is considering public and other stakeholder input and has not made any determinations yet on the findings.
- Sec. 189. Study on Potential Health and Economic Impacts of Overflight Noise: Requires FAA to engage a university to conduct a health study in a number of metropolitan areas (Boston, Chicago, the District of Columbia, New York, the Northern California Metroplex, Phoenix, the Southern California Metroplex, Seattle, or such other area as may be identified by the FAA), focusing on: "incremental health impacts on residents living partly or wholly underneath flight paths most frequently used by aircraft flying at an altitude lower than 10,000 feet, including during takeoff or landing"; and "an assessment of the relationship between a perceived increase in aircraft noise, including as a result of a change in flight paths that increases the visibility of aircraft from a certain location, and an actual increase in aircraft noise, particularly in areas with high or variable levels of non-aircraft-related ambient noise." FAA initiated a study on cardiovascular disease and aircraft noise exposure through its ASCENT Center of Excellence for Alternative Jet Fuels and Environment. Boston University is leading ongoing research.

The FAA has a number of ongoing research studies aimed to support policymaking around aviation noise:

- The Neighborhood Environmental Survey:[41] is a multi-year effort to update the scientific evidence on the relationship between aircraft noise exposure and its effects on communities around airports. This is the study referenced in FAA Reauthorization Section 187.
- ASCENT research on sleep disturbance:[42] The long-term goal of this project is to understand the relationship between aircraft noise and sleep disturbance in the United States. This project's researchers are investigating the use of actigraphy and electrocardiography as a cost-effective tool for studying large cohorts of people.

41 Federal Aviation Administration. Neighborhood Environmental Survey. https://www.faa.gov/regulations_policies/policy_guidance/noise/survey.

42 Ascent. Pilot Study on Aircraft Noise and Sleep Disturbance. https://ascent.aero/project/noise-exposure-response-sleep-disturbance/.

- Review of the Civilian Aviation Noise Policy:[43] Massport responded to FAA's request for comments seeking input on its review of four key considerations of its civil aviation noise policy, in the context of noise metrics and noise thresholds. Massport's letter is reproduced as **Figure 7-22.**

In addition to tracking FAA-related studies, Massport is also closely following international research on the state of the science around effects of aircraft noise on people including:

- The International Civil Aviation Organization's (ICAO) Committee on Aviation Environmental Protection (CAEP). Massport is reviewing ongoing research and information as part of each CAEP cycle such as the ICAO Guidance Document *Operational Opportunities to Reduce Aircraft Noise*.
- The United Kingdom Civil Aviation Authority publishes periodic update documents following ongoing research into aircraft noise.

43 The comment period to the request for comments published on May 1, 2023, was extended to September 29, 2023. https://www.federalregister.gov/documents/2023/07/11/2023-14597/request-for-comments-on-the-federal-aviation-administrations-review-the-civil-aviation-noise-policy

Figure 7-22 Massport Comments on FAA Civil Aviation Noise

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

September 19, 2023

Filed electronically through www.regulations.gov
Docket number FAA-2023-0855
Mr. Donald Scata
Office of Environment and Energy
Federal Aviation Administration, DOT

Re: Comment Letter on Federal Aviation Administration (FAA) Federal Register Notice *Docket No. FAA-2023-0855*: Request for Comments on the Federal Aviation Administration's Review of the Civilian Aviation Noise Policy

On behalf of the Massachusetts Port Authority (Massport), I am submitting this comment letter to the FAA's Federal Register Notice "Request for Comments on the Federal Aviation Administration's Review of the Civilian Aviation Noise Policy" (Docket No. FAA-2023-0855) and to provide our perspective on the FAA's Noise Policy Review.

Massport and the FAA have a strong, historic partnership in collaborating on environmental research and in implementing one of the oldest and most successful airport noise mitigation programs in the nation. The most recent example of this collaboration is the Memorandum of Understanding (MOU) between Massport and the FAA that leveraged current research by the FAA's Aviation Sustainability Center (ASCENT) and MIT. The focus of the MOU was to identify and evaluate opportunities to reduce the noise impacts of the FAA's nationwide rollout of Performance-Based Navigation (PBN) procedures at Boston Logan International Airport (Boston Logan). Although implementation work continues, the study has been successfully completed.

Massport appreciates the FAA's decision to seek additional stakeholder and public input regarding its Noise Policy. Aviation is critical for economic activity and long term growth. We believe that a key reason the industry has been successful is its proven track record of reducing environmental impacts. Past research that led to reductions in noise and air emissions is the reason that the industry has been so successful in addressing these challenges and we strongly encourage the FAA to continue important research to inform national policy. Over time, the research-informed policy will benefit communities in close proximity to airports through more efficient flight operations, reduced noise, and reduced local air emissions and it will support the industry's efforts to tackle climate change challenges.

The day-night average sound level (DNL) noise metric has functioned well for determining areas of noise/land use compatibility. Consistent with federal requirements, Massport has utilized the DNL 65 dB contour to determine eligibility for our Residential Sound Insulation Program since the program began in the 1980's. To date, with FAA assistance, we have sound-insulated over 11,000 homes. We encourage the FAA to continue to fully fund noise mitigation efforts and minimize hurdles to qualifying for sound insulation treatments for those residents within the DNL 65 dB contour.

At Boston Logan, the DNL 65 dB contour has shrunk significantly as air carriers phased out stage 2, stage 3 hush-kitted, and older stage 3 aircraft. As a result, the number of people within the Boston Logan DNL 65 dB contour has dropped from over 100,000 in the 1980s, to fewer than 10,000 in 2019 and 2022, while our passenger levels have more than doubled. However, the FAA's Neighborhood Environmental Survey (NES) results indicate that today there is

Figure 7-22 Massport Comments on FAA Civil Aviation Noise (*continued*)

greater community sensitivity to noise energy than indicated by the Schultz Curve (the basis for the DNL 65 significance threshold). These findings are consistent with our experience.

In addition to DNL, Massport also supports the use of supplemental metrics, such as a metric to account for overflight frequency. This "N Above"[i] metric was successfully used by MIT in evaluating and communicating the benefits and impacts of strategies designed to reduce annoyance as a result of PBN flight procedures around Boston Logan. Supplemental metrics often provide more easily understood descriptions of noise than the DNL metric alone especially for areas outside of the DNL 65 dB contour. The additional metrics offer opportunities to better communicate and visualize the effects of proposed changes to the national airspace system.

We request that the FAA continue to analyze the survey data and methodology to be able to better describe the causes of the magnitude of the disconnect between reduction in noise and emissions and continued community complaints. Please consider including analysis of broader trends such as: economic trends, demographics, use of social media, increased sensitivity to the environment, land use development, and the advent of PBN procedures. A deeper analysis of the NES data may help better explain this shift and inform the type and effectiveness of policies that may be evaluated to further reduce aviation impacts over the long run. The additional information would also help airports discuss these new findings with our communities.

Massport fully supports FAA's ongoing research related to noise, health impacts, sleep disturbance, and air emissions. We believe that the industry and the FAA are better served with informed research so that we can continue to accommodate growth while reducing our overall environmental footprint. This research will also help identify and target future industry efforts to address noise impacts while informing the public on the relative impact of aviation to the local environment and to their daily lives.

We also support ongoing research on new vehicle types including supersonic and AAM/UAM technology. It is important to the successful adoption of the new technology that community concerns related to overflight noise, emissions, and congestion are acknowledged and are used to inform industry and FAA policy.

Thank you for the opportunity to comment on the FAA's Federal Register Notice. We are looking forward to continued engagement on this critical topic and in the FAA's ongoing research.

Sincerely,
Massachusetts Port Authority

Edward C. Freni
Director of Aviation

cc: Colleen D'Alessandro (FAA); Aaron Toffler (Massport CAC); John Nucci, Lisa Wieland, Alaina Coppola, Flavio Leo

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1 "N_x counts the number of overflights during a time period, where "x" represents the $L_{A,max}$ noise level that is exceeded." (Source: MIT *Approach for Representing the Aircraft Noise Impacts of Concentrated Flight Tracks*).

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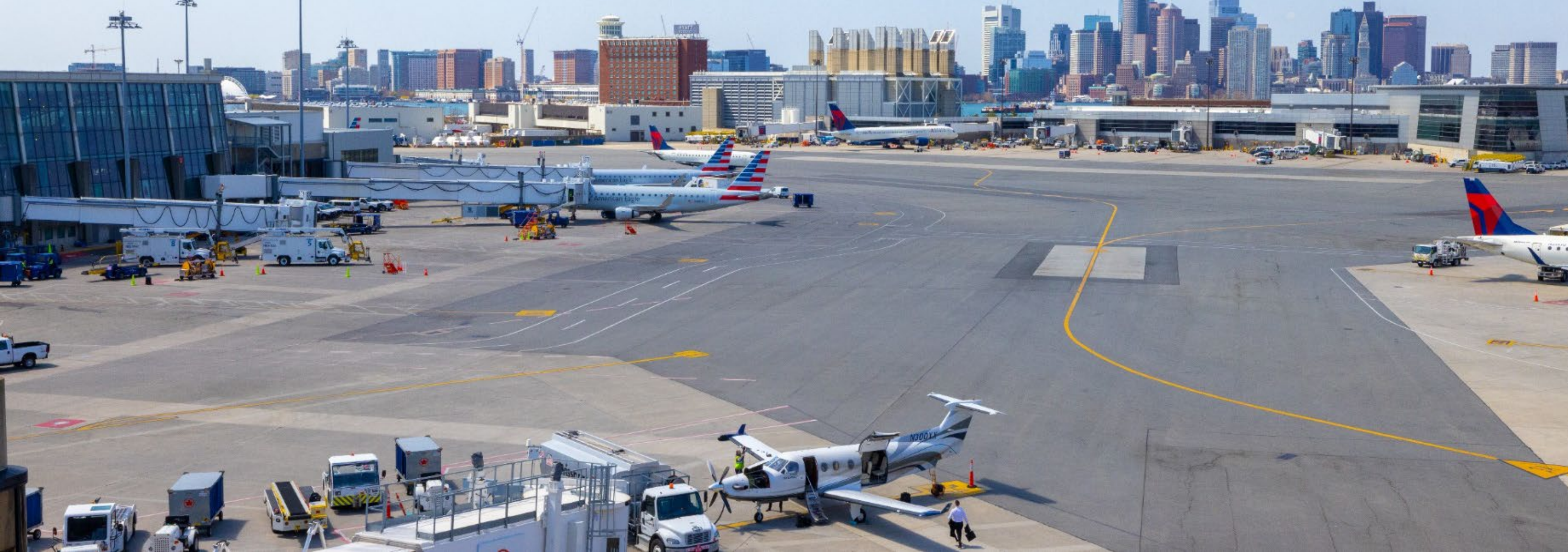

8. Air Quality and Greenhouse Gas Emissions

This chapter of the *2022 ESPR* describes air quality emissions at Logan Airport in 2022. The chapter also compares 2022 conditions with emission levels in 2021 as well as with historical air quality conditions in 2019 prior to COVID-19 and earlier years, which serve as a benchmark point of reference to provide context for the progress made towards reducing emissions and improving air quality in and around Logan Airport. Finally, the chapter covers anticipated future conditions forecasted over the next 10 to 15 years. An annual inventory of 2022 **greenhouse gas (GHG)** emissions and anticipated future GHG emissions is also provided. Additional information on the data, assumptions, and methodologies used to develop the content in this chapter is provided in Appendix J, *Air Quality and Greenhouse Gas Emissions Supporting Documentation*.

Airport-related emissions are associated with a wide range of sources, including aircraft, on and off-road vehicles, building heating and cooling systems, mechanical equipment, purchased electricity, and power generation. Using the methods described in this chapter, Massport's annual emissions inventory estimates the air emissions from airport-related sources, which are then compared to levels computed in previous years. The emissions are computed for U.S. Environmental Protection Agency (U.S.EPA) defined **criteria air pollutants** and their precursors, including volatile organic compounds (VOCs), nitrogen oxides (NO_X), carbon monoxide (CO), and particulate matter ($PM_{10}/PM_{2.5}$). Emissions are also computed for GHGs, which as a group include carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). In addition to computing emission levels for 2022, this ESPR also estimates anticipated future emissions. As with noise and ground access conditions, air quality is closely tied to airport activity levels, and most directly to aircraft and vehicle movements.

While the number of **aircraft operations** and **air passengers** increased in 2022 compared to 2021 levels, these remained below pre-COVID-19 levels in 2019. Passenger demand and airline seating capacity have continued to increase in 2022 as the U.S. continues to transition from pandemic conditions to a new normal post-COVID.

Logan Airport is expected to serve around **53.3 million air passengers** and conduct about **495,000 flights** over the Future Planning Horizon of the next 10 to 15 years.

Logan Airport activity levels are projected to increase to approximately 53.3 million annual air passengers (MAP) and 495,000 aircraft operations over the **Future Planning Horizon** of the next 10 to 15 years. In this *2022 ESPR*, the Future Planning Horizon activity levels serve as the basis for assessing future environmental effects of airport operations. The *2022 ESPR* provides an opportunity to revisit previous forecasts completed for the *2017 ESPR* and update them based on current data and industry trends as well as other changes that have occurred over the previous five years. Projected future air quality and GHG emissions are based on airside and landside activity level forecasts over the Future Planning Horizon associated with aircraft operations and fleet mix, passenger activities, and ground transportation activity levels. For further information on the development of the future long-range forecast, refer to Chapter 3, *Activity Levels and Forecasting*.

Massport remains committed to implementing their longstanding emissions reduction strategies as identified in previous **Environmental Data Report (EDR)** and ESPR publications, and those documented in this chapter as well as in Chapter 10, *Project Mitigation*. Specifically, the *2022 ESPR* reports on the progress of energy efficiency, emissions reduction, and clean energy strategies outlined in Massport's *Roadmap to Net Zero by 2031* (Net Zero by 2031), the goal of which is to reach net zero GHG emissions for those emissions under Massport's direct control by 2031, Massport's 75th anniversary.

2022 Air Quality Key Findings

The following details key findings regarding air quality conditions at the Airport in 2022:

- In addition to Airport-specific initiatives, Massport is joining others across the aviation industry in implementing long-term strategies to reduce GHG emissions, such as transitioning to **sustainable aviation fuels (SAF)** made from non-petroleum feedstocks that reduce lifecycle GHG emissions.
- Total modeled Airport-related emissions of VOCs, NO_X, CO, and $PM_{10}/PM_{2.5}$ increased from 2021 to 2022, but still remained less than emissions modeled in 2019.
- The GHG analysis includes the following key findings, which are discussed further in Section 8.3.2:
    - Logan Airport's total GHG emissions in 2022 were less than 1 percent of the most recent statewide total emissions estimates.
    - In 2022, Massport-controlled, Scope 1 emissions represented 5.4 percent of Airport-wide GHG emissions; in-direct, Scope 2 emissions from purchased electricity represented 7.3 percent; and Scope 3 emissions, which originate from sources controlled by tenants or the public, represented 87.3 percent of Logan Airport's total GHG emissions.

- Logan Airport's total GHG emissions, including Scopes 1, 2, and 3, increased from 2021 to 2022 but remained below 2019 levels. The increase from 2021 to 2022 is primarily attributable to the increase in operational and passenger activity levels. Similarly, the lower emissions in 2022 when compared to 2019 are due to the lower operational and passenger activities in 2022.

Air Quality Key Findings for Future Forecast

- In the Future Planning Horizon, Airport sources of VOCs, NO_X, $PM_{10}/PM_{2.5}$, and CO will continue to stay well below the criteria pollutant thresholds set by the U.S.EPA and are expected to decrease substantially compared to 1990 benchmark levels.
  - Operations sources are expected to remain at similar levels even as flights are expected to increase.
  - When compared to 2022 levels, total emissions of VOCs, NO_X, and $PM_{10}/PM_{2.5}$ are predicted to increase and total emissions of CO are predicted to decrease.
  - Projected reductions in CO emissions are due to a combination of converting commercially available **ground service equipment (GSE)** to viable electric alternatives; lower motor vehicle emissions due to greater efficiency and cleaner technologies; changes in aircraft fleet-mix; and emission reductions due to Net Zero by 2031 program efforts.
- Compared to conditions in the 1990s, emissions from airport sources are expected to decrease significantly and operations sources are expected to remain steady, even as flights are expected to increase. This is due to improvements made in aircraft technology, fuel emissions, and efficiency gains.
- The Future Planning Horizon extends beyond the 2031 date for Massport's Net Zero by 2031.
- In the Future Planning Horizon, Massport's Scope 1 GHG emissions are anticipated to decrease by nearly 90 percent compared to 2022 emissions. A full reduction to net zero will likely take longer. Scopes 2 and 3 emissions increase by 10.7 and 14.2 percent, respectively, from 2022 levels.
- Massport is focused on reducing GHG emissions across all facilities and becoming net zero for activities under its direct control by 2031.
- For areas where GHG emissions cannot be reduced to zero, Massport will invest in carbon offsets to reach the target.
- The Authority expects to be net zero without offsets by 2040. Carbon offsets are investments in GHG-reducing projects, such as solar farms, which diminish the impact of an organization's own GHG emissions, and if possible, Massport intends to purchase offsets that benefit local and State projects.
- Massport will continue to incentivize and encourage entities responsible Scope 3 emissions, such as airlines, tenant-owned GSE, rental car facilities, taxis and RideApp service providers, and others, to also pursue net zero goals.

> Although the number of **flights is expected to increase** over the Future Planning Horizon, Airport **emissions are projected to decrease** overall due to improved aircraft technologies, cleaner fuels, and better operational efficiencies.

Air Quality Management and Key Initiatives Summary

Massport is a national leader in studying, tracking, and reporting on the air quality environment of Logan Airport and implementing measures to reduce emissions. Massport annually prepares an inventory of Airport-related emissions of the following U.S.EPA criteria air pollutants and their precursors; CO, NO_2, PM_{10}/$PM_{2.5}$,[1] and VOCs.[2] However, lead (Pb) and sulfur dioxide (SO_2) emissions are not computed, as airport emission sources are very small generators of these two U.S.EPA criteria air pollutants. Estimates of primary GHGs associated with Logan Airport operations are also prepared. The primary GHGs include CO_2, CH_4, and N_2O.

Massport's air quality management strategy for Logan Airport focuses on decreasing emissions from Airport-related sources. Key Massport initiatives to reduce criteria air pollutant and GHG emissions from Airport operations include:

- Providing pre-conditioned air (PCA) and 400-Hertz (Hz) power at all aircraft contact gates to reduce emissions associated with aircraft idling and **auxiliary power unit (APU)** use;
- Facilitating the replacement of gas- and diesel-powered ground service equipment with electric equivalents (eGSE), where commercially available;
- At the time of this filing, Massport is piloting a renewable diesel use program;
- Installing airside charging stations to support the use of battery-powered eGSE, such as aircraft tugs and belt loaders;
- Encouraging single-engine taxiing procedures by the airlines, when safe, to reduce both noise and air emissions;
- Installing **electric vehicle (EV)** charging stations available for public use, including RideApp vehicles, black car limousines, and taxis;
- Replacing older Massport fleet vehicles with **alternative fuel vehicles (AFVs)** or EVs;
- Replacing existing gas- and diesel-powered GSE with electric equivalents, where commercially available, and actively working with airlines on GSE replacement;
- Piloting a renewable diesel program as a sustainable fuel replacement for fossil-fuel-based diesel, which Massport has initiated as of this filing;
- Committing to the U.S. Green Building Council's (U.S.GBC) **Leadership in Energy and Environmental Design (LEED®)** green building standards, the Institute for Sustainable Infrastructure (ISI) Envision™ certifications, and other sustainability standards;
- Investing in on-Airport renewable energy installations, like solar energy facilities;
- Using cleaner fuels for shuttle buses, including compressed natural gas (CNG) and hybrid technologies;

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1 PM emissions are emissions of PM with a diameter that is 10 micrometers and smaller (PM_{10}) which is inclusive of particulate matter with a diameter that is 2.5 micrometers and smaller ($PM_{2.5}$).

2 Emissions of NO_2 are conservatively estimated by preparing emission estimates of total nitrogen oxides (NOx).

- Transitioning Massport and tenant fleets and equipment to low- or zero-emissions options, where feasible;
- Implementing strategies to promote high-occupancy vehicle (HOV) use and ground transportation improvements; and
- Continuing to develop and implement energy efficiency, emissions reduction, and clean energy strategies outlined in Net Zero by 2031.

Additionally, Massport is focused on reducing GHG emissions across all facilities and becoming net zero by 2031. The Net Zero by 2031 plan focuses on reducing GHG emissions from Scope 1 sources directly controlled by Massport, such as Massport-owned facilities and equipment, and Scope 2 sources, namely purchased electricity. However, Massport will continue to influence Scope 3 sources, or areas where Massport does not have direct or in-direct control. By implementing the initiatives outlined in the Net Zero by 2031 plan will directly benefit neighboring communities by reducing emissions and further preparing Massport for the impacts of climate change over the Future Planning Horizon and beyond.

A central element of Massport's emissions reduction initiatives is a comprehensive ground access strategy to diversify and enhance transportation options for passengers and employees, and to efficiently move vehicles while they are on the Airport property. Massport is committed to reducing on-Airport **vehicle miles traveled (VMT)** and emissions associated with airport roadways and curbsides, parking facilities, and vehicle staging areas, as well as reducing the VMT by Airport users traveling to and from the Airport.

Massport strongly supports the Logan Express system and encourages its use by:

- Investing in Logan Express facility improvements and additional parking;
- Offering priority security lines for users;
- Reducing fares; and
- Providing free fares for select Silver Line and Back Bay Logan Express routes.

Massport's ground transportation strategy is designed to help reduce vehicle air emissions and improve air quality by providing a broad range of HOV, public transit, and shared-ride options for travel to and from Logan Airport. The strategy also aims to reduce drop-off and pick-up modes by providing sufficient parking on-Airport for passengers choosing to drive or with limited HOV options.

Massport's Logan Express system remains a centerpiece of Logan Airport HOV options. In addition to evaluating new Logan Express service offerings, Massport is investing in existing Logan Express sites; increasing parking capacity and service frequency at Logan Express locations; implementing priority security lines for Logan Express riders; reducing urban Logan Express fares; providing free **Massachusetts Bay Transportation Authority (MBTA)** Silver Line outbound boarding from Logan Airport; and providing free Back Bay Logan Express outbound fares. Massport continues to carefully review both on and off-Airport activity levels and adjusts its ground access programs to align with ridership levels.

By enhancing the Airport's roadway system, vehicles can circulate more efficiently, resulting in lower overall emissions. Chapter 6, *Ground Access*, Section 6.5, provides detailed information on Massport's ground access and parking management strategies.

As part of its Net Zero by 2031 effort, and to support the federal goal of 3 billion gallons of SAF use by 2030 for the aviation industry nationwide, Massport is collaborating with fuel vendors, airlines, and state and federal entities regarding securing SAF supplies in the Northeast. Massport is a founding member of the Zero Impact Aviation Alliance (ZIAA), which is a consortium of airports, aviation industry businesses, aircraft manufacturers, and academic institutions focused on achieving net zero for airport operations, including promoting SAF use. ZIAA is spearheaded by the Massachusetts Institute of Technology (MIT) through the Department of Aeronautics and Astronautics, and with their support, ZIAA provides research-driven thought leadership across the aviation system to reduce environmental impacts.

https://aeroastro.mit.edu/zero-impact-aviation-alliance-ziaa/

In addition to Massport's initiatives, airlines operating at Logan Airport are also implementing strategies to reduce emissions. For example, jetBlue Airways has achieved carbon-neutral flying on all its domestic services through its fleet of aircraft and carbon offsets, and have also announced a plan for an accelerated transition to SAF with a target to convert 10 percent of the airline's total fuel usage to SAF on a blended basis by 2030.[3] Airlines with similar goals include Delta Air Lines, which has set a target of 10 percent SAF utilization by 2030, and United Airlines, which has a target of reaching 100 percent green net zero by 2050.

8.1 Regulatory Framework

Air quality and GHG emissions associated with Logan Airport activities are governed by federal and state requirements. Massport voluntarily reports on GHG emissions in the ESPRs and EDRs.

- The federal Clean Air Act (CAA), **National Ambient Air Quality Standards (NAAQS)** administered by the Environmental Protection Agency (U.S.EPA), and similar state laws administered by the Massachusetts Department of Environmental Protection (MassDEP) govern air quality issues in Massachusetts.

3 jetBlue, "jetBlue Accelerates Transition to Sustainable Aviation Fuel (SAF) With Plans for the Largest-Ever Supply of SAF in New York Airports for a Commercial Airline," September 29, 2021. http://mediaroom.JetBlue.com/investor-relations/press-releases/2021/09-29-2021-132310033.

- The NAAQS and the Massachusetts State Implementation Plan (SIP), a document that describes measures to attain and maintain compliance with the NAAQS, regulate air quality in the Boston Metropolitan Area and other areas of the State.
- In May 2010, the **Massachusetts Executive Office of Energy and Environmental Affairs (EEA)** revised the **Massachusetts Environmental Policy Act (MEPA)** *Greenhouse Gas Emissions Policy and Protocol*.[4] Under the revised policy, certain projects subject to review under MEPA (though not annual EDR/ESPR filings) are required to:
  - Quantify GHG emissions generated by a proposed project; and
  - Identify measures to avoid, minimize, or mitigate such emissions.[5]

These regulations as well as those associated with GHGs are detailed in Appendix J, Section J.2.

8.2 Assessment Methodology

The following sections provide a brief overview of the emission sources and pollutants inventoried as well as the modeling tools used to estimate emissions for calendar year 2022 and the Future Planning Horizon.

8.2.1 Sources

As with prior EDRs and ESPRs, air and GHG emissions sources for 2022 and future planning activity levels were modeled for aircraft-related sources (i.e., aircraft engines), GSE (including APUs), motor vehicles, and an "other" category that includes a variety of stationary sources, fuel storage, and handling facilities that are owned and operated by Massport. Emissions of criteria air pollutants and precursor pollutants and GHGs were estimated based on input data such as activity levels or material throughput rates (e.g., fuel usage, VMT, electricity consumption, etc.) applied to appropriate emission factors (e.g., grams per VMT).

8.2.2 Pollutants

For the *2022 ESPR,* U.S.EPA criteria air pollutant emissions and their associated precursors, including VOCs, NO_X, CO, and PM_{10}/$PM_{2.5}$ were modeled. There are no source emission rates for the air pollutant ozone (O_3) because it is formed by the interactions between VOCs and NO_X in the presence of sunlight. Emissions of Pb and SO_2 are not computed, as airport emission sources are very small generators of these two U.S.EPA criteria air pollutants. This is because there are very few aircraft that use leaded fuel and SO_2 is primarily generated by fuel combustion at power plants and other industrial facilities that are not affiliated with Logan Airport.

4 Commonwealth of Massachusetts, Executive Office of Energy and Environmental Affairs, Revised MEPA Greenhouse Gas Emissions Policy and Protocol, effective May 5, 2010, https://www.mass.gov/files/documents/2016/08/rp/ghg-policy-final-summary.pdf.

5 GHGs are comprised primarily of carbon dioxide (CO_2), methane (CH_4), nitrous oxides (N_2O), and three groups of fluorinated gases, sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs). GHG emission sources associated with airports are generally limited to CO_2, CH_4, and N_2O.

Estimates of primary GHGs (CO_2, CH_4, and N_2O) associated with Logan Airport operations were also modeled. The results of the *2022 ESPR* are reported in units of **metric tons (MT) of CO_2 equivalents (CO_2e),** or **MT CO_2e**, based on the appropriate Global Warming Potentials (GWPs). The GWPs and emission factors used to prepare the GHG estimates were obtained from the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) and the U.S.EPA, respectively.

8.2.3 Models and Databases

The modeling tools and emission factor databases used to estimate emissions for calendar year 2022 and the Future Planning Horizon are listed below and further detailed in Appendix J, Section J.3.

- FAA **Aviation Environmental Design Tool (AEDT, Version 3e or AEDT3e)**,
- U.S.EPA **Motor Vehicle Emission Simulator (MOVES, Version 3.1 or MOVES3.1)**, and
- U.S.EPA GHG Emission Factors Hub (modified on April 1, 2022).

8.3 Emissions Inventory in 2022

The following sections provide the results of the 2022 Logan Airport emission inventories for the criteria air, precursor pollutants, and GHGs. Information on the data inputs and assumptions used to estimate the 2022 Logan Airport emissions are provided in Appendix J, Section J.4.

8.3.1 2022 Criteria air and precursor pollutants Emission Inventory Results

Under the federal Clean Air Act, U.S.EPA has established National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants. This section provides the results of the 2022 Logan Airport emissions inventories for the criteria air pollutants and precursor pollutants (VOC, NO_X, CO, and $PM_{10}/PM_{2.5}$) using the AEDT3e and MOVES3.1 models and standard emission factors for stationary sources.

U.S.EPA research has correlated adverse health effects with exposure to high levels of criteria pollutants, and as a result, has set regulatory thresholds. However, Logan Airport's emissions are, and have historically been, below these threshold limits.

- Aircraft emissions inventory was modeled based on the actual number of aircraft operations, fleet mix, and operational times-in-mode at Logan Airport in 2022. Aircraft emissions are computed from ground level up to the mixing height (i.e., 3,000 feet).
- GSE emissions, including APUs; motor vehicles; fuel storage and handling facilities; and a variety of stationary sources, such as steam boilers, snow melters, live-fire training, space heaters, and emergency generators associated with Logan Airport were also computed based on actual fuel use and operations conditions.

As in previous EDRs and ESPRs, the 2022 emissions inventories for Logan Airport are compared to the previous years' inventory results as well as to previous EDRs and ESPRs extending back to 1990. Since

2021, activity levels were influenced by COVID-19, and most comparisons between 2022 and 2021 are not representative. Therefore, while those numbers are reported, a more relevant comparison is between 2022 and 2019 (pre-COVID-19).

For **historical context**, and to set a frame of reference for the 2022 and the future forecast results, air quality **data for 1990 and 1998 and 2017 to 2021 are provided**; enabling 2022 emissions comparisons between the future forecasted conditions, the recent past, and **historical "benchmark" years**.

The change in emissions year-to-year is a function of several variables. These include:

- Numbers of aircraft operations and VMT
- Changes in the aircraft fleet
- Advancements in aircraft engine technologies
- Improved airfield efficiencies
- Massport's emission reduction measures, such as the GSE replacement initiatives

Another variable is the continuous evolution of air quality models. An example of the effects of the differences among model versions can be seen in Section 8.3.1.5 of this chapter.

To better understand and highlight the effects of model changes, Massport has calculated 2022 emissions using both the current and prior model versions. From an air quality perspective, the primary differences between the two model versions (AEDT3e versus the previous AEDT3d) are the updates to the aircraft fleet inputs (i.e., aircraft and engine combinations). As a result of the differences between available aircraft and engine combination model defaults, the AEDT3e model results with the 2022 aircraft fleet presented in **Table 8-1** show a slight increase in aircraft emissions for VOC, CO, and $PM_{10}/PM_{2.5}$ (1.4 percent, 0.4 percent, and 0.2 percent, respectively), and a negligible decrease in NO_X (less than 1 percent) when compared to AEDT3d. These changes are attributable to model updates and refinements, not changes in operations or other factors. Since its release, the FAA has continually enhanced the AEDT model by expanding its capabilities, correcting computational errors, and making it more user-friendly, and then releasing updated versions for future use.

Additionally, **Table 8-1** shows the differences by pollutant due to the changes in the aircraft fleet mix and number of aircraft operations between 2021 and 2022, and 2019 and 2022. The increase in all types of pollutant emissions from 2021 (AEDT3d) to 2022 (AEDT3d) is attributable to the differences between aircraft fleet mix, but is mostly attributable to the number of aircraft operations, which were lower in 2021 as the aviation industry was still rebounding from COVID-19. Operations increased by 42 percent from 2021 to 2022. Also, the decrease in all types of pollutant emissions from 2022 (AEDT3e) compared to 2019 (AEDT3c) is primarily attributable to 13 percent more aircraft operations in 2019 than in 2022.

As shown in **Table 8-2,** the 2022 total emissions inventory using AEDT3e/MOVES3.1 results in higher emissions of all pollutants in comparison to the 2021 inventory using AEDT3d/MOVES3.0.3. The differences between the 2022 and 2021 inventories are predominantly due to the increase in passenger and aircraft operational levels. The total 2022 emissions inventory using AEDT3e/MOVES3.1 results in lower emissions of all types of pollutants except $PM_{10}/PM_{2.5}$ in comparison to the 2019 inventory using

AEDT3c/MOVES2014b. These lower emissions are primarily due to the passenger and aircraft operational activity levels being lower in 2022 compared to 2019.

Table 8-1 Aircraft Emissions Inventory Comparison

Year	Model Version	Pollutant (kg/day)			
		VOCs	NO_X	CO	$PM_{10}/PM_{2.5}$
2019	AEDT3c	771	6,123	7,171	58
2021	AEDT3d	399	3,576	3,678	32
2022	AEDT3d	671	5,677	5,566	47
2022	AEDT3e	681	5,650	5,586	47
% Difference between 2022 AEDT3e versus 2019 AEDT3c:		-12%	-8%	-22%	-19%
% Difference between 2022 AEDT3d versus 2021 AEDT3d:		68%	59%	51%	45%
% Difference between 2022 AEDT3e versus 2022 AEDT3d:		1.4%	-0.5%	0.4%	0.2%

Source: Massport and CMT, 2023.

Notes: Modeled emissions totals are rounded numbers. Percent calculations are based on exact numbers.
CO – carbon monoxide; NO_X – oxides of nitrogen; $PM_{10}/PM_{2.5}$ – particulate matter with a diameter that is 10 micrometers and smaller (PM_{10}) which is inclusive of particulate matter with a diameter that is 2.5 micrometers and smaller ($PM_{2.5}$); VOCs – volatile organic compounds.

However, $PM_{10}/PM_{2.5}$ emissions are slightly higher due to the difference in MOVES model versions between those years. According to EPA's 2021 MOVES3 Update Log, MOVES3.0.3 results in higher $PM_{10}/PM_{2.5}$ outputs compared to MOVES2014b due to:

- Differences in the two database servers for MOVES3.0.3 (MariaDB) versus MOVES 2014b (MySQL); and
- Updates to the vehicle population, travel activities, and emission rates.

The following sections compare the air emission results by pollutant (i.e., VOC, NO_X, CO, and $PM_{10}/PM_{2.5}$) and by source (i.e., aircraft, GSEs and APUs, motor vehicles, stationary sources, and non-mobile sources) between 2022 and 2021 as well as 2019.

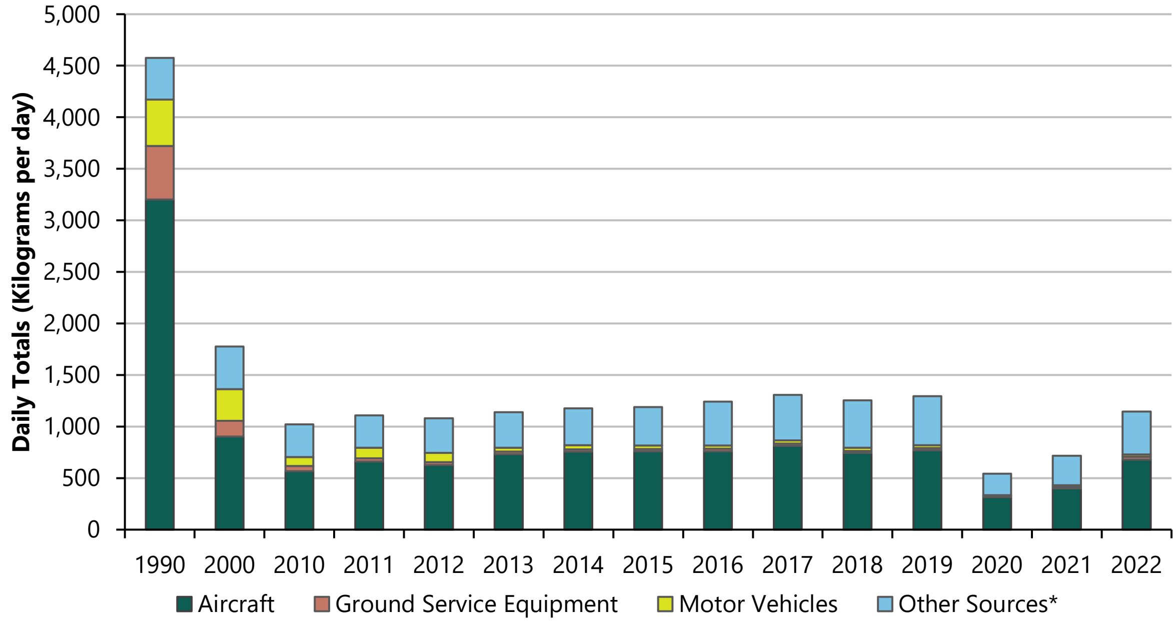
Table 8-2 Total Emissions Inventory Comparison

Year	Model Versions	Pollutant (kg/day)			
		VOCs	NO_X	CO	$PM_{10}/PM_{2.5}$
2019	AEDT3c and MOVES2014b	1,295	6,440	8,267	92
2021	AEDT3d and MOVES3.0.3	716	3,756	4,321	71
2022	AEDT3e and MOVES3.1	1,145	5,8	6,456	113
% Difference 2022 and 2021		60%	56%	49%	58%
% Difference 2022 and 2019		-12%	-9%	-23%	22%

Source: Massport and CMT, 2023.

Notes: Modeled emissions totals are rounded numbers. Percent calculations are based on exact numbers.
AEDT – Aviation Environmental Design Tool; VOCs – volatile organic compounds; NO_X – oxides of nitrogen; CO – carbon monoxide; $PM_{10}/PM_{2.5}$ – particulate matter with a diameter that is 10 micrometers and smaller (PM_{10}) which is inclusive of particulate matter with a diameter that is 2.5 micrometers and smaller ($PM_{2.5}$).

Figure 8-1 Modeled Emissions of VOCs at Logan Airport, 1990, 2000 and 2010-2022



Source: Massport and CMT, 2023.

Notes: Other Sources include miscellaneous sources (i.e., Central Heating Plant, snow melter usage, fire training, etc.) and fuel sources. In 2022, aircraft-related emissions were calculated using AEDT3e and motor vehicles were calculated using MOVES3.1.

8.3.1.2 2022 Volatile Organic Compounds (VOCs)

VOCs are compounds of carbon that take part in atmospheric photochemical reactions. The U.S.EPA considers VOCs to be s criteria air pollutant as research has shown correlations between respiratory system effects in humans and exposure to VOCs at high levels. However, Massport modeling results and data from U.S.EPA air monitors on Dudley Square in Boston consistently show VOC levels in air are well below NAAQS standards and are expected to remain well below these standards.

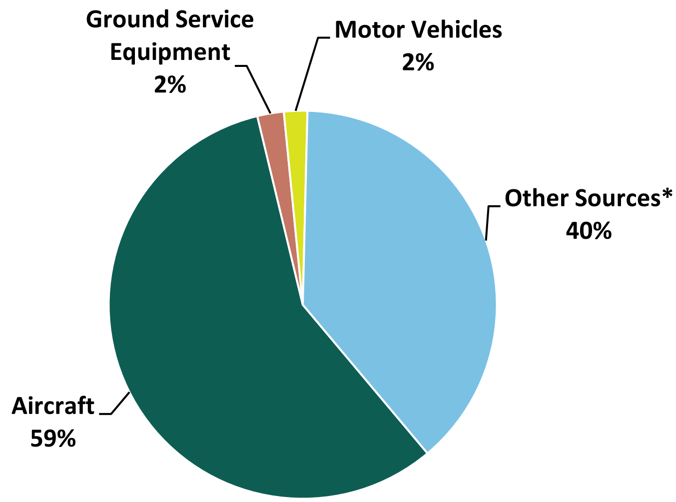
In 2022, total VOC emissions at Logan Airport were calculated as 461 tons per year (tpy), or 1,145 kilograms per day (kg/day). The 2022 VOC emissions show an increase of 60 percent from 2021 levels, 288 tpy or 716 kg/day, from increased operations as a result of COVID-19 recovery, but the 2022 VOC emissions were still 12 percent less than 2019 levels.

As shown in **Figure 8-1**, the long-term trend for VOC emissions reveals a substantial decrease from 1990 through 2010; approximately 77 percent. From 2010 to 2019, there has been an increasing trend in emissions with fluctuations on an annual basis. As expected, VOC emissions decreased from 2019 to 2022. **Figure 8-2** shows the percent breakdown of VOC emissions by source category for 2022. **Table 8-3** provides the computed VOC emissions in kg/day for each emission source for 1990, 1998, and 2017 to 2022.

Other key findings from this analysis include the following:

- Total aircraft-related VOC emissions increased by 70.4 percent in 2022 (AEDT3e) compared with 2021 (AEDT3d). The increase in 2022 compared to 2021 was largely due to the increase in aircraft operations in 2022. However, differences in fleet mix between 2022 and 2021 as well as model version differences between AEDT3e and 3d may also have influenced the emission results. Aircraft-related VOC emissions for 2022 are 11.7 percent below 2019 levels.
- GSE-related VOC emissions, including APUs, were 62.0 percent higher in 2022 (AEDT3e) than in 2021 (AEDT3d). Again, the differences in emissions between 2022 and 2021 are largely due to the change in aircraft operations between the two analysis years, which in turn affects the GSE and APU assignments to an aircraft. In 2022, GSE-related VOC emissions were 27.0 percent higher than 2019 levels due to the 2022 fleet mix having higher VOC-emitting equipment in AEDT.
- Similarly, VOC emissions from motor vehicles in 2022 increased 25.9 percent from 2021 levels. 2022 motor vehicle VOC emissions remain 22.7 percent below 2019 levels.
- VOC emissions from stationary sources and other non-mobile sources, like fuel storage and handling, Central Heating Plant operation, snow melter usage, and firefighter training, for example, have increased by 45.2 percent in 2022 from 2021 due to the increased energy usage in 2022. VOC emissions remain 12.5 percent below 2019 levels.
- As shown in **Figure 8-2**, aircraft continued to represent the largest source of VOC emissions associated with Logan Airport in 2022, followed by other sources, and GSE and motor vehicles.

Figure 8-2 Sources of VOC Emissions, 2022



Source: Massport and CMT, 2023.
Notes: Other Sources include stationary sources and fuel storage and handling facilities.
In 2022, aircraft-related emissions were calculated using AEDT3e and motor vehicles were calculated using MOVES3.1.

Table 8-3 Estimated VOC Emissions (kg/day) at Logan Airport, 1990, 1998 and 2017-2022[1]

Aircraft/GSE Model	LDMS	EDMS v3.22	AEDT Version 2c SP2	AEDT Version 2d		AEDT Version 3c			AEDT Version 3d			AEDT Version 3e
Motor Vehicle Model	MOBILE 5a	MOBILE 5a_h	MOVES 2014a	MOVES 2014b				MOVES 3.0.3				MOVES 3.1
Year:	1990	1998	2017		2018		2019	2020		2021	2022[2]	
Aircraft Sources												
Air carriers	2,175	736	516	517	531	531	561	191	190	221	421	422
Commuter aircraft	681	154	65	77	81	89	84	34	35	47	93	93
Cargo aircraft	303	43	50	50	23	23	21	50	51	64	85	85
General aviation (GA)	44	13	183	134	110	116	105	40	39	67	71	80
Total Aircraft Sources	**3,203**	**946**	**814**	**778**	**745**	**759**	**771**	**315**	**314**	**399**	**671**	**681**
Ground Service Equipment (GSE)[2]	518	145	22	22	19	21	21	13	13	16	27	27
Motor Vehicles												
Parking / curbside	192	118	3	3	3	3	3	1	1	1	4	4
On-Airport vehicles	258	258	26	26	28	28	26	6	6	13	19	19
Total Motor Vehicle Sources	**450**	**376**	**29**	**29**	**30**	**30**	**29**	**7**	**7**	**14**	**23**	**23**
Other Sources												
Fuel storage / handling	400	372	439	439	455	455	469	205	205	282	410	410
Miscellaneous sources[3]	4	2	5	5	5	5	5	4	4	4	5	5
Total Other Sources	**404**	**374**	**444**	**444**	**460**	**460**	**475**	**209**	**209**	**286**	**415**	**415**
Total Airport Sources	**4,575**	**1,841**	**1,308**	**1,273**	**1,253**	**1,270**	**1,295**	**544**	**543**	**716**	**1,136**	**1,145**

Source: Massport and CMT, 2024.

Notes: Values may reflect rounding.

LDMS – Logan Dispersion Modeling System

EDMS – Emissions and Dispersion Modeling System

AEDT – Aviation Environmental Design Tool

MOVES – Motor Vehicle Emission Simulator

kg/day - kilograms per day. 1 kg/day is equivalent to approximately 0.40234 tons per year (tpy).

1 See the *Boston Logan International Airport 2020/2021 Environmental Data Report (EDR)*, published in November 2022, for historical emission inventory results from 1993 to 2016.

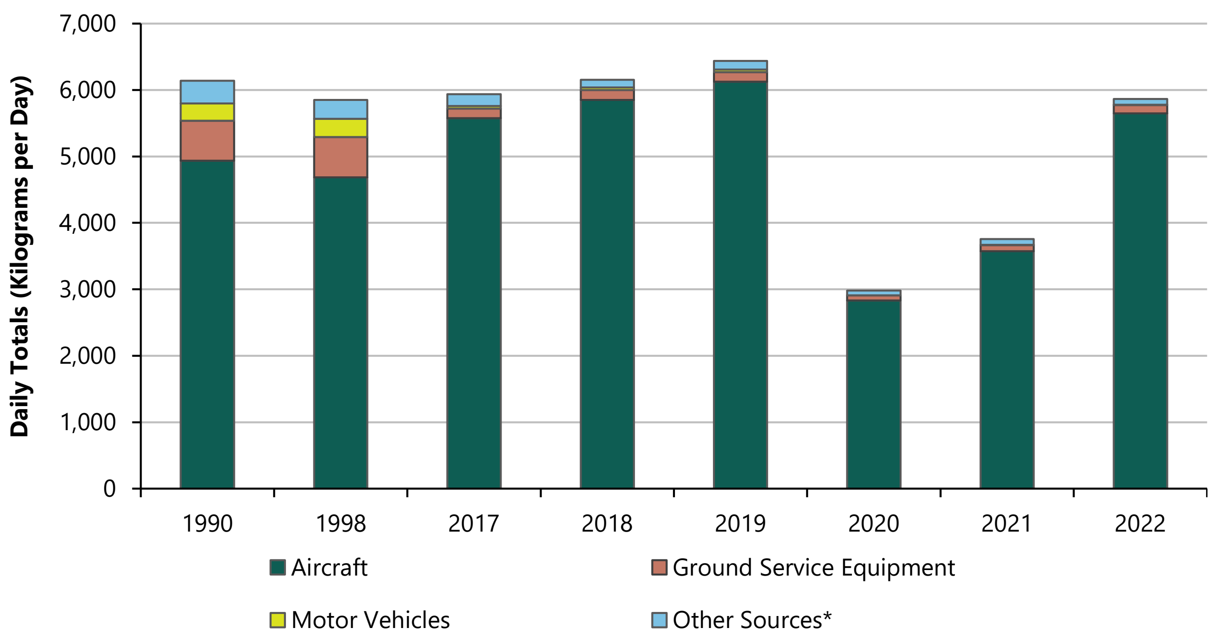
2 GSE emissions include aircraft auxiliary power units (APUs) as well as vehicles and equipment converted to alternative fuels.

3 Includes the Central Heating Plant, emergency electricity generation, snow melter usage, and other stationary sources.

8.3.1.3 2022 Oxides of Nitrogen (NO_X)

As mentioned above, NO_X, along with VOCs, are the primary precursors to the formation of O_3. The U.S.EPA considers O_3, a criteria air pollutant, important because of respiratory system effects in humans at high levels. Massport modeling and U.S.EPA air monitors on Dudley Square in Boston consistently show levels are well below NAAQS standards and are expected to remain well below these standards. The 2022 total NO_X emissions from all Airport-related sources were estimated to be 2,360 tpy (5,866 kg/day), which represents an increase from 2021 levels of 1,511 tpy (3,756 kg/day). The 2019 total NO_X emissions from all Airport-related sources were estimated to be 2,591 tpy or 6,440 kg/day, which was 8.9 percent more than 2022 levels. The increase from 2021 to 2022 is largely due to the increase in the number of landings and takeoffs (LTOs) and continued COVID-19 recovery. In 2022, aircraft taxi and delay times at Logan Airport were 27.8 minutes, a 24.7 percent increase from 2021 taxi time levels and a 1 percent decrease from 2019 taxi time levels. **Figure 8-3** illustrates short- and long-term trends in NO_X emissions, and **Table 8-4** shows the NO_X contribution for each emission source in 1990, 1998, 2000, and 2010 through 2022. Additionally, **Figure 8-4** shows the 2022 percent breakdown of NO_X emissions by source category.

Figure 8-3 Modeled Emissions of NO_X at Logan Airport, 1990, 1998, and 2017-2022



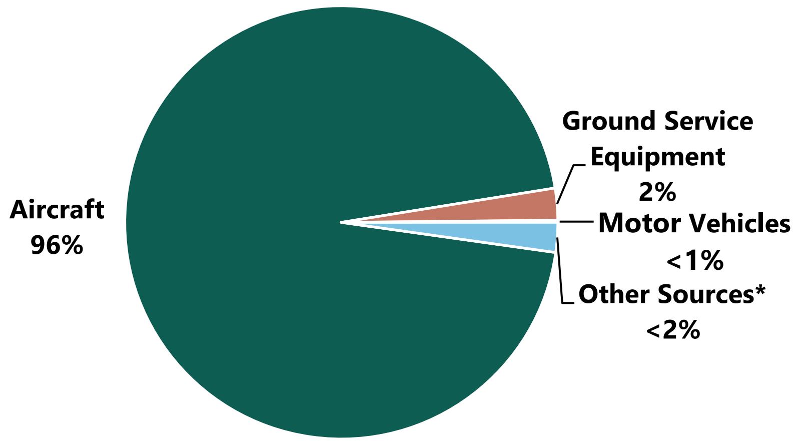
Source: Massport and CMT, 2023.

Notes: Other Sources include stationary sources (e.g., Central Heating Plant, snow melter usage, firefighter training, etc.).
In 2022, aircraft-related emissions were calculated using AEDT3e and motor vehicles were calculated using MOVES3.1.

Key findings of the 2022 NO_X emissions inventory results and comparisons to the prior 2021 and pre-COVID-19 inventory of 2019 are detailed below. The overall increases in NO_X emissions from 2022 to 2021 are largely due to the continued recovery in operational and passenger levels. The number of operations and passengers increased in 2022; therefore, NO_X emissions show an increase from 2021 levels for all source categories.

- Compared to 2022 (AEDT3e) values, total aircraft-related NO_X emissions were 58.0 percent higher than in 2021 (AEDT3d). The 2022 NO_X emissions were 7.7 percent below 2019 levels (AEDT3c).
- The 2022 total GSE-related NO_X emissions, including APUs, increased by 36.5 percent (AEDT3e) compared to 2021 (AEDT3d). The 2022 GSE-related NO_X emissions were 16.9 percent less than 2019 levels.
- NO_X emissions from motor vehicles in 2022 increased 15.3 percent from 2021 levels due to a 38.4 percent increase in VMT and an increase in dwell times, as determined by Massport's *2023 Terminal Curbside Traffic Survey*. However, 2022 NO_X emissions from motor vehicles were still below 2019 levels (81.7 percent).
- Stationary sources showed an increase in NO_X emissions of 1.7 percent in 2022 compared to 2021. The NO_X emissions from stationary sources in 2022 were 34.6 percent less than 2019 levels. Emission factors for 2022 were based on the stack test data performed in March 2022.

Figure 8-4 Sources of NO_X Emissions, 2022



Source: Massport and CMT, 2023.
Notes: Other Sources include stationary sources (e.g., Central Heating Plant, snow melter usage, fire training, etc.).
In 2022, aircraft-related emissions were calculated using AEDT3e, and motor vehicles were calculated using MOVES3.1.

As shown in **Figure 8-4**, aircraft emissions continue to represent the largest source of NO_X at Logan Airport (approximately 96 percent) in 2022, with the remaining comprising of GSE, other sources, and motor vehicles (approximately 4 percent). This is an important distinction as Massport does not have any control over aircraft and GSE emissions. As discussed below, NO_X is the one pollutant that generally has increased over the past few decades; higher NO_X levels are largely attributed to newer model aircraft engines that have been designed to reduce noise by using higher engine revolutions per minute (RPMs), which generate higher NO_X.

Table 8-4 Estimated NO_X Emissions (kg/day) at Logan Airport, 1990, 1998, and 2017-2022[1]

Aircraft/GSE Model:	LDMS	EDMS v3.22	AEDT 2c SP2	AEDT2d		AEDT3c			AEDT3d			AEDT 3e
Motor Vehicle Model:	MOBILE 5a	MOBILE 5a_h	MOVES 2014a	MOVES 2014b				MOVES 3.0.3				MOVES 3.1
Year:	1990	1998	2017		2018		2019	2020		2021	2022	
Aircraft Sources												
Air carriers	4,554	4,471	5,098	5,100	5,336	5,292	5,522	2,368	2,334	2,884	4,862	4,834
Commuter aircraft	133	203	185	196	251	246	267	117	120	258	322	322
Cargo aircraft	237	254	224	224	236	239	252	319	295	380	423	423
General aviation (GA)	13	5	41	57	69	72	82	28	28	54	71	71
Total Aircraft Sources	**4,937**	**4,933**	**5,548**	**5,577**	**5,892**	**5,849**	**6,123**	**2,832**	**2,777**	**3,576**	**5,677**	**5,650**
Ground Service Equipment (GSE)[2]	603	317	143	143	127	149	148	77	77	90	123	123
Motor Vehicles												
Parking / curbside	25	37	4	4	4	4	3	<1	<1	2	2	2
On-Airport vehicles	232	372	37	37	38	38	34	2	2	4	5	5
Total Motor Vehicle Sources	**257**	**409**	**41**	**41**	**42**	**42**	**37**	**3**	**3**	**6**	**7**	**7**
Other Sources												
Miscellaneous sources[3]	344	284	174	174	113	113	132	72	72	85	86	86
Total other sources[4]	344	284	174	174	112	112	132	72	72	85	86	86
Total Airport Sources	**6,141**	**5,943**	**5,906**	**5,935**	**6,173**	**6,152**	**6,440**	**2,929**	**2,984**	**3,756**	**5,893**	**5,866**

Source: Massport and CMT, 2024.

Notes: Values may reflect rounding.

LDMS – Logan Dispersion Modeling System; EDMS – Emissions and Dispersion Modeling System

AEDT – Aviation Environmental Design Tool; MOVES – Motor Vehicle Emission Simulator

kg/day - kilograms per day. 1 kg/day is equivalent to approximately 0.40234 tons per year (tpy).

1 See the *Boston Logan International Airport 2020/2021 Environmental Data Report (EDR)*, published in November 2022, for prior year (1993 to 2016) emission inventory results.

2 GSE emissions include aircraft auxiliary power units (APUs) as well as vehicles and equipment converted to alternative fuels.

3 Includes the Central Heating Plant, emergency electricity generation, snow melter usage, and other stationary sources.

4 Fuel storage and handling activities do not emit NO_X, therefore are not included in the table.

Effect of Aircraft Engine Technology on NOX

Aircraft engine manufacturers are continually advancing combustion technology that is designed to mitigate and reverse the trade-offs between lower emissions, less noise, and increased NO_X. When representative aircraft are compared, as aircraft engines become quieter, improving from Stage 3 to Stage 5, and more efficient, NO_X and PM_{10}/$PM_{2.5}$ emissions increase. For comparison, emissions of CO decrease, and VOC emissions fluctuate between noise stage equivalents.

As a means of reducing amounts and costs of fuel use, aircraft engine designers and manufacturers are producing more fuel-efficient engines that burn less fuel. This is achieved by enhancing engine performance with improved fuel combustion technologies, greater thrust-generating power, and less engine wear. Aircraft are also being designed to decrease fuel-burn with advancements in aircraft wing and body aerodynamics, light-weight alloy materials, and improved means of navigation. These emerging technologies and reduced fuel-burn are expected to reduce emissions, reduce noise, and moderate the growth in NO_X emissions into the future.

Changes in the fleet mix, like greater use of quieter but higher NO_X-emitting aircraft, are likely to continue in the future. Most NO_X emissions from aircraft originate from high-temperature, high-pressure reactions of atmospheric nitrogen in aircraft engines. Over time, aircraft engine technology has evolved to be more fuel-efficient, less polluting, and quieter, in large part, due to improved fuel combustion under these higher temperature and pressure conditions. This interdependency (or trade-off) between increased NO_X, less noise, better fuel efficiency, and generally lower emission factors for other pollutants, is an outcome of the modernization of the commercial air carrier fleet.

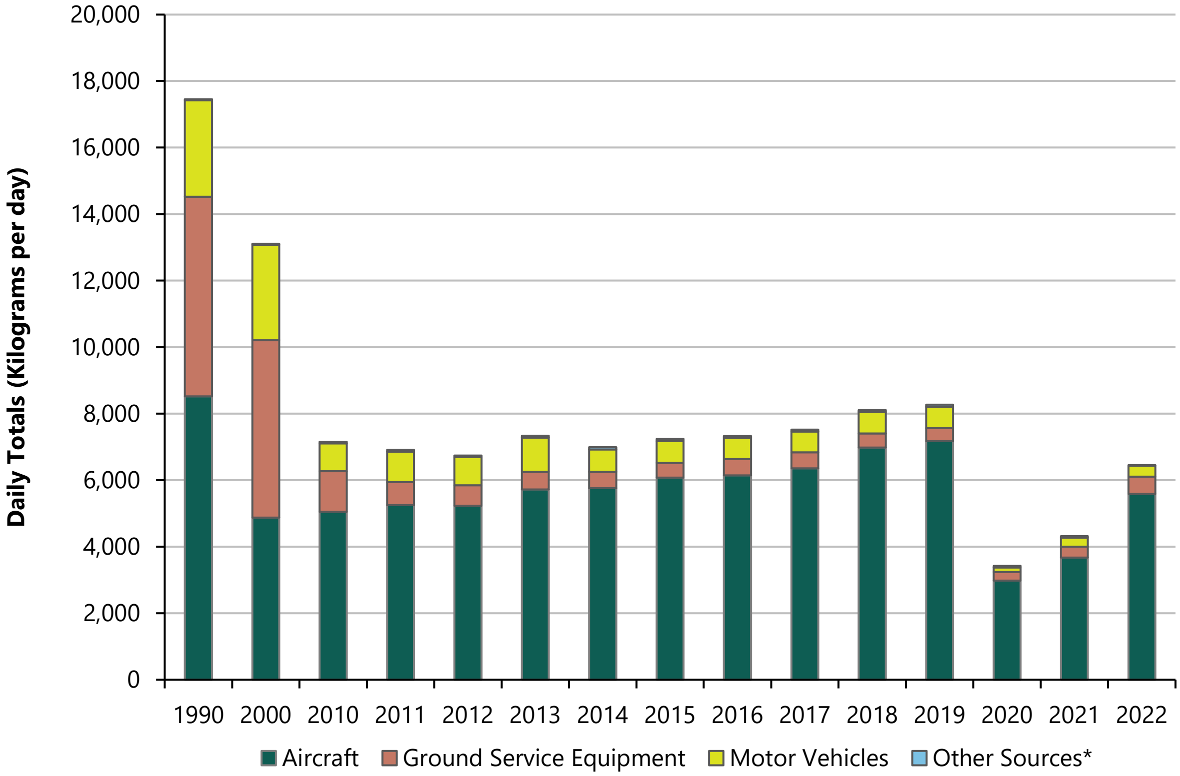
8.3.1.4 2022 Carbon Monoxide (CO)

CO is a colorless, odorless, tasteless gas that is emitted by various combustion engines and fuel types. The U.S.EPA considers CO, a criteria air pollutant, important because of cardiovascular and central nervous system effects in humans at high levels. Massport modeling and U.S.EPA air monitors on Harrison Avenue in Boston consistently show levels are well below NAAQS standards and are expected to remain well below these standards.

Total CO emissions[6] at Logan Airport in 2022 were 2,597 tpy (6,456 kg/day), 49.4 percent higher than 2021 levels 1,739 tpy (4,321 kg/day), and 21.9 percent lower than 2019 levels 3,326 tpy (8,267 kg/day). An increase in emissions from 2021 to 2022 is associated with COVID-19 recovery. **Figure 8-5** shows the long-term trend, about 63 percent overall reduction from 1990 levels to 2022, in CO emissions associated with Airport activities. **Table 8-5** also shows the breakdown of these emissions, by source category, for the years 1990, 1998, and 2017 to 2022.

6 The totals include activity levels from aircraft operations and motor vehicles. The types of aircraft and engine combinations have variations in emission factors. Additionally, in 2019 and 2022, different versions of AEDT and MOVES were used, resulting in higher percentages than the percent of activity level growth.

Figure 8-5 Modeled Emissions of CO at Logan Airport, 1990, 2000, and 2010-2022



Source: Massport and CMT, 2023.
Notes: Other stationary sources are not visible on the graph as they make up less than 1 percent of the total.
In 2022, aircraft-related emissions were calculated using AEDT3e and motor vehicles were calculated using MOVES3.1.

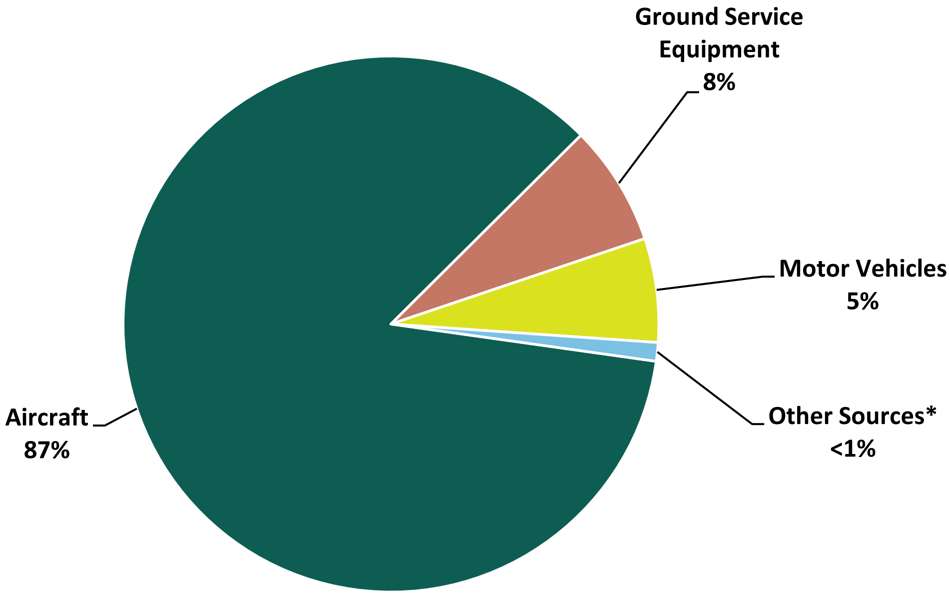
Other findings of the CO emissions inventory include:

- Aircraft-related CO emissions increased 51.9 percent in 2022 compared to 2021 levels due to the increase in operations. Aircraft-related CO emissions in 2022 were 22.1 percent lower than 2019 levels.
- GSE-related (including APUs) CO emissions increased by 63.4 percent in 2022 compared to 2021, due to the change in aircraft operations and overall increase in GSE run-time as a result. In 2022, GSE-related CO emissions are 31.2 percent higher than 2019 levels due to the 2022 fleet mix having higher VOC-emitting equipment as modeled in AEDT.
- CO emissions from motor vehicles increased in 2022 by 19.4 percent from 2021 levels. This increase was largely attributable to higher VMT counts from on-Airport vehicles. The CO emissions from motor vehicles in 2022 were 48.5 percent less than 2019 levels.
- Stationary sources showed a decrease of 59.3 percent in CO emissions in 2022 compared to 2021. This is primarily attributable to a decrease in boiler usage at Logan Airport's Central Heating Plant in 2022. The CO emissions from stationary sources in 2022 are 67.5 percent less than 2019 levels.

Again, as with total emissions of VOCs and NO_X, the overall, long-term trend over the past two decades reveals a substantial decrease in total CO emissions associated with Airport activities.

As shown in **Figure 8-6**, in 2022, aircraft emissions continued to represent the largest source of CO (approximately 87 percent) at Logan Airport, followed by GSE (approximately 8 percent), motor vehicles (approximately 5 percent), and other sources (less than 1 percent).

Figure 8-6 Sources of CO Emissions, 2022



Source: Massport and CMT, 2023.

Notes: Other sources include stationary sources (e.g., Central Heating Plant, snow melter usage, fire training, etc.) and fueling sources.

In 2022, aircraft-related emissions were calculated using AEDT3e and motor vehicles were calculated using MOVES3.1.

Table 8-5 Estimated CO Emissions (kg/day) at Logan Airport, 1990, 1998, and 2017-2022[1]

Aircraft/GSE Model:	LDMS	EDMS v3.22	AEDT2c SP2	AEDT2d		AEDT3c			AEDT3d			AEDT3e
Motor Vehicle Model:	MOBILE 5a	MOBILE 5a_h	MOVES 2014a	MOVES 2014b				MOVES 3.0.3				MOVES 3.1
Year:	1990	1998	2017		2018		2019	2020		2021	2022	
Aircraft Sources												
Air carriers	6,613	3,079	3,736	3,740	3,955	3,976	4,182	1,368	1,355	1,549	3,037	3,042
Commuter aircraft	977	482	1,905	1,525	1,661	2,483	2,477	1,247	1,251	1,617	1,847	1,849
Cargo aircraft	576	218	192	192	143	145	150	229	233	289	392	393
General aviation (GA)	352	269	526	470	353	374	363	141	139	223	290	302
Total Aircraft Sources	8,518	4,048	6,359	5,926	6,113	6,978	7,171	2,985	2,979	3,678	5,566	5,586
Ground Service Equipment (GSE)[2]	6,001	5,113	482	483	392	428	397	255	255	319	522	522
Motor Vehicles												
Parking / curbside	1,218	772	32	32	28	28	28	2	2	4	10	10
On-Airport vehicles	1,689	1,883	592	592	620	620	609	132	132	271	319	319
Total Motor Vehicle Sources	2,907	2,655	623	623	648	648	636	135	135	275	329	328
Other Sources												
Miscellaneous sources[3]	31	37	60	60	52	52	62	47	47	49	20	20
Total Other Sources[4]	31	37	60	60	52	52	62	47	47	49	20	20
Total Airport Sources	17,457	11,853	7,524	7,092	7,205	8,106	8,267	3,421	3,416	4,321	6,437	6,456

Source: Massport and CMT, 2024.

Notes: Values may reflect rounding.

LDMS – Logan Dispersion Modeling System; EDMS – Emissions and Dispersion Modeling System

AEDT – Aviation Environmental Design Tool; MOVES – Motor Vehicle Emission Simulator

kg/day - kilograms per day. 1 kg/day is equivalent to approximately 0.40234 tons per year (tpy).

1 See the *Boston Logan International Airport 2020/2021 Environmental Data Report (EDR)*, published in November 2022, for prior year (1993 to 2016) emission inventory results.

2 GSE emissions include aircraft auxiliary power units (APUs) as well as vehicles and equipment converted to alternative fuels.

3 Includes the Central Heating Plant, emergency electricity generation, snow melter usage, and other stationary sources.

4 Fuel storage and handling activities do not emit CO, therefore are not included in the table.

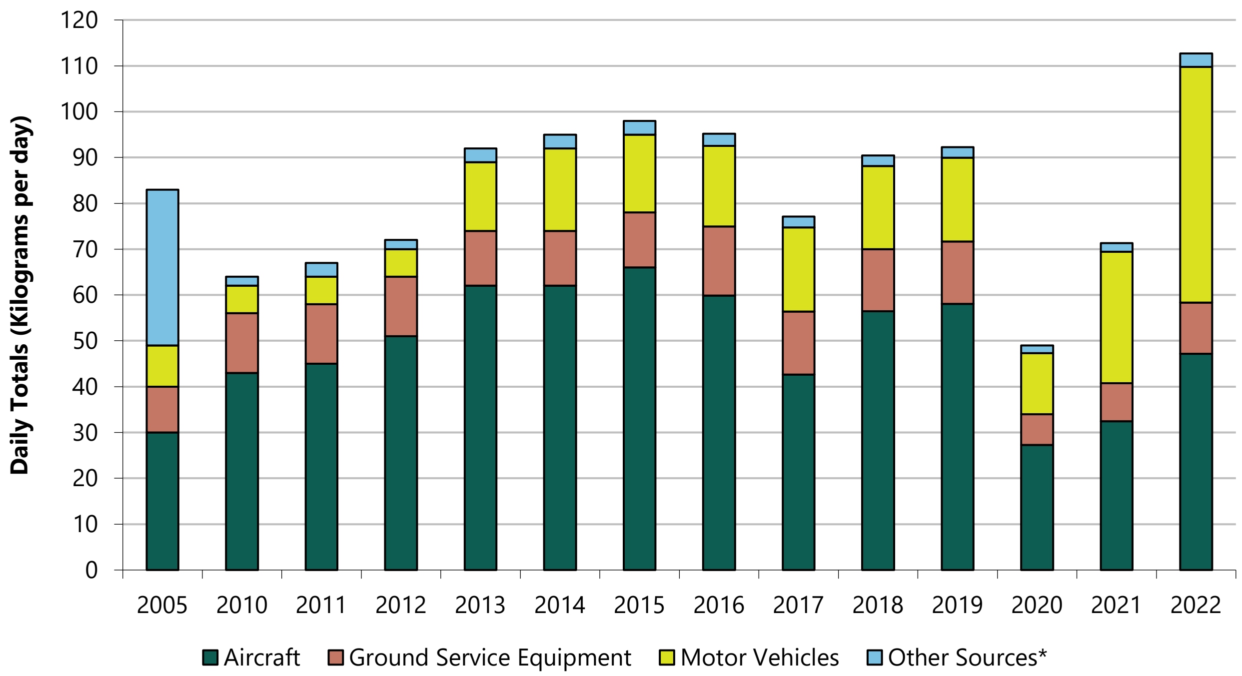
8.3.1.5 2022 Particulate Matter

PM is made up of tiny solid particles that consist of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The regulatory standards for PM are categorized by size: less than or equal to 10 micrometers (PM_{10}) and less than or equal to 2.5 micrometers ($PM_{2.5}$). PM exposure may affect the respiratory system in humans. The U.S.EPA considers PM_{10}/$PM_{2.5}$, criteria air pollutants, important because of respiratory system effects in humans at high levels. Massport modeling and U.S.EPA air monitors on Harrison Avenue in Boston consistently show levels are well below NAAQS standards and are expected to remain well below these standards.

In 2022, total estimated PM_{10}/$PM_{2.5}$ emissions at Logan Airport were estimated to be 45 tpy (113 kg/day), which represents an increase from 2021 levels (29 tpy or 71 kg/day). This increase is largely due to the increase in the number of LTOs in 2022 and continued COVID-19 recovery. The 2022 PM_{10}/$PM_{2.5}$ emissions remain 22.1 percent lower than 2019 levels.

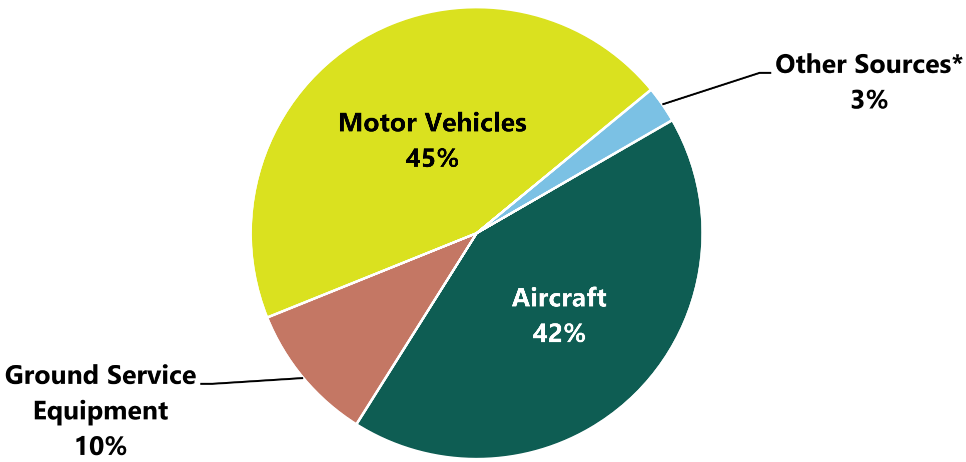
Table 8-6 and **Figure 8-7** show the PM_{10}/$PM_{2.5}$ contribution for each emission source and by source category for the years 2017 through 2022, respectively. **Figure 8-7** shows the long-term trend in PM_{10}/$PM_{2.5}$ emissions associated with Airport activities.

Figure 8-7 Modeled Emissions of PM_{10}/$PM_{2.5}$ at Logan Airport, 2005 and 2017-2022



Source: Massport and CMT, 2023.
Notes: Other Sources include stationary sources (e.g., Central Heating Plant, snow melter usage, fire training, etc.) and fuel sources. In 2022, aircraft-related emissions were calculated using AEDT3e and motor vehicles were calculated using MOVES3.1.

Figure 8-8 Sources of $PM_{10}/PM_{2.5}$ Emissions, 2022



Source: Massport and CMT, 2023.
Note: Other Sources include stationary sources (e.g., Central Heating Plant, snow melter usage, fire training, etc.).
In 2022, aircraft-related emissions were calculated using AEDT3e and motor vehicles were calculated using MOVES3.1.

Figure 8-8 presents the $PM_{10}/PM_{2.5}$ breakdown by source category for 2022. PM emissions in 2022 remain well below 2019 levels. Explanations of these results and other key findings include the following:

- Estimated aircraft-related $PM_{10}/PM_{2.5}$ emissions increased by 45.4 percent in 2022 (AEDT3e) compared to 2021 (AEDT3d) levels. This increase is attributable to the change in aircraft operations. However, aircraft-related $PM_{10}/PM_{2.5}$ emissions in 2022 were 18.7 percent lower than 2019 levels.
- $PM_{10}/PM_{2.5}$ associated with GSE-related emissions, including APUs, increased by 34.1 percent in 2022 (AEDT3e) when compared to 2021 (AEDT3d), largely due to the change in operations and fleet mix which increased aircraft-based GSE and APU operating times. In 2022, emissions were 18.1 percent lower than 2019 levels.
- $PM_{10}/PM_{2.5}$ emissions from motor vehicles increased by 79.3 percent in 2022 when compared to 2021 levels, primarily attributable to an increase in motor vehicle volumes. Notably, 2022 $PM_{10}/PM_{2.5}$ emissions from motor vehicles also increased from 2019 levels. This is attributable to the differences in database servers between the MOVES3 model and the prior MOVES2014 version as well as updates to the vehicle population, travel activities, and emission rates. As stated earlier in the chapter, MOVES Version 3, as well as later versions, results in higher $PM_{10}/PM_{2.5}$ outputs compared to MOVES2014b. For example, emission factors of $PM_{10}/PM_{2.5}$ using MOVE3 on average are 2.8 times higher than those developed for the same fleet using MOVES2014b.

- Stationary source emissions of $PM_{10}/PM_{2.5}$ increased by 58.1 percent in 2022 compared to 2021 due to an increase in stationary source activity levels. The $PM_{10}/PM_{2.5}$ emissions from stationary sources and other non-mobile sources in 2022 are 25.9 percent higher than 2019 levels. These sources include snowmelters, boilers, emergency generators, space heaters, and fire training activities. While there is a lower use of ultra-low sulfur diesel (ULSD) and natural gas for boilers in 2022, there was an increase in emergency generator hours due to maintenance activities in 2022 compared to 2021.
- As shown in **Figure 8-8**, in 2022, aircraft emissions represented the largest source of $PM_{10}/PM_{2.5}$ at Logan Airport, followed by motor vehicles, GSE, and other sources.

Table 8-6 Estimated $PM_{10}/PM_{2.5}$ Emissions (in kg/day) at Logan Airport, 2017-2022[1]

Aircraft/GSE Model:	AEDT2c SP2	AEDT2d		AEDT3c			AEDT3d			AEDT3e
Motor Vehicle Model:	**MOVES 2014a**	**MOVES 2014b**				**MOVES 3.0.3**				**MOVES 3.1**
Year:	**2017**		**2018**		**2019**	**2020**		**2021**	**2022**	
Aircraft Sources										
Air carriers	36	36	37	49	51	23	23	26	39	39
Commuter aircraft	2	3	3	4	4	2	2	2	3	3
Cargo aircraft	1	1	1	1	1	2	2	2	3	3
General aviation (GA)	3	2	2	2	2	1	1	1	2	2
Total Aircraft Sources	42	43	43	56	58	27	27	32	47	47
Ground Service Equipment (GSE)[2]	14	14	11	14	14	7	7	8	11	11
Motor Vehicles										
Parking / curbside	<1	<1	<1	<1	<1	<1	<1	<1	1	1
On-Airport vehicles	18	18	18	18	18	13	13	28	50	50
Total Motor Vehicle Sources	18	18	18	18	18	13	13	29	51	51
Other Sources										
Miscellaneous sources[3]	2	2	2	2	2	2	2	2	3	3
Total Other Sources[4]	2	2	2	2	2	2	2	2	3	3
Total Airport Sources	77	77	74	90	92	49	49	71	112	113

Sources: Massport and CMT, 2024.

Notes: Values may reflect rounding.
LDMS – Logan Dispersion Modeling System; EDMS – Emissions and Dispersion Modeling System
AEDT – Aviation Environmental Design Tool; MOVES – Motor Vehicle Emission Simulator
kg/day - kilograms per day. 1 kg/day is equivalent to approximately 0.40234 tons per year (tpy).

1 See the *Boston Logan International Airport 2020/2021 Environmental Data Report (EDR)*, published in November 2022, for prior year (1993 to 2016) emission inventory results.
2 GSE emissions include aircraft auxiliary power units (APUs) as well as vehicles and equipment converted to alternative fuels.
3 Includes the Central Heating Plant, emergency electricity generation, snow melter usage, and other stationary sources.
4 Fuel storage and handling activities do not emit $PM_{10}/PM_{2.5}$, therefore are not included in the table.

Particles (UFPs)

Within the field of air quality, airborne particles are collectively categorized as PM and subdivided into size categories based on their diameters. These divisions are total suspended particles (TSP) with diameters ranging from 2.5 to 40 micrometers (μm), coarse particles (PM_{10}) with diameters ranging from 2.5 to 10 μm, fine particles ($PM_{2.5}$) with diameters less than 2.5 μm, and UFPs with diameters less than 0.1 μm. Most of these particles originate from the exhaust gases generated by fossil fuel-powered engines and other high-temperature combustion sources including aircraft.

Outdoor concentrations within U.S.EPA standards are considered safe for the public. Presently, UFPs by themselves are not regulated ambient air pollutants. UFPs cannot be considered part of PM2.5 because PM2.5 is regulated by a mass per volume concentration, and UFPs have a comparatively negligible mass. Any eventual UFP regulation would likely be regulated by particle count (or particle number concentrations).

On December 18, 2020, the U.S.EPA published a final action in the Federal Register detailing the agency's review of the NAAQS for PM_{10}/$PM_{2.5}$. UFP is addressed in the supplemental information of the notice. In its review of the PM_{10}/$PM_{2.5}$ NAAQS, the agency determined that due to significant uncertainties and limitations, as well as the limited availability of air monitoring data, the NAAQS for $PM_{2.5}$ would be retained as the indicator for UFP.

To better understand Airport UFP emissions relative to other UFP sources, Massport cooperates with Boston University, Tufts University, and other researchers to differentiate aircraft-specific-related UFPs in an urban environment from the numerous other, non-Airport related UFP sources.

Massport is supportive of cooperative research efforts that are being funded by the FAA and co-led by Washington State University and the Massachusetts Institute of Technology (MIT), which are known as the FAA Center of Excellence for Alternative Jet Fuels and Environment, Aviation Sustainability Center (ASCENT).[7] The primary purpose of the research is the measurement of aviation emissions and aviation's contribution to ambient levels of air pollution. As part of the studies, ASCENT is measuring UFPs in the vicinity of Logan Airport to determine variations in the contribution of aviation emissions to ground-level air pollutant concentrations by location and over time. They are also constructing regression models using measured data from 2017 and 2018 to determine the contributions of aviation sources to UFP and black carbon (BC).[8]

In an effort to better understand how Logan Airport UFP emissions relate to other UFP sources, Massport continues to cooperate with Boston University, Tufts University, and other researchers to try and identify aircraft-specific-related UFPs in an urban environment with numerous non-Airport related UFP sources.

7 U.S. DOT, Federal Aviation Administration, Center of Excellence for Alternative Jet Fuels & Environment. https://ascent.aero/.

8 ASCENT Project 018 2020 Annual Report. https://s3.wp.wsu.edu/uploads/sites/2479/2021/04/ASCENT-Project-018-2020-Annual-Report.pdf.

This research is ongoing in the East Boston, South Boston, and Chelsea area and Massport continues to contribute by providing Logan Airport operational and other pertinent data.

Advancements on the national and international levels to decrease Airport-related air emissions have continued to focus primarily on three initiatives:

- Advanced quantification of particulate matter and hazardous air pollutants (HAPs) emissions from aircraft engines;
- Continued phasing-in of alternative fuel vehicles with lower emissions; and
- Implementation of GHG emissions reduction strategies.

Additional information on Ultrafine Particles (UFPs) and how they relate to airport emission sources can be found in Appendix J, Section J.8.4. Information on studies in which Massport is providing information is also included in Appendix J.

8.3.2 2022 Greenhouse Gas Emission Inventory Results

airport carbon accreditation

Massport continues to voluntarily report on GHG emissions associated with airport activities in EDRs and ESPRs. GHG emission inventories computed for this *2022 ESPR* are consistent, wherever applicable, with the data provided by Massport for the MassDEP and U.S.EPA GHG inventories for Logan Airport for 2022. The *2022 ESPR* emissions inventories presented are more comprehensive, as they cover all three scopes of GHG emissions including those from tenants and the public, whereas the MassDEP and U.S.EPA GHG Reporting Program covers only stationary sources (Scope 1 sources) such as buildings, the Central Heating Plant, snow melters and emergency generators, etc. GHG Reporting is also consistent with the Airport Carbon Accreditation (ACA) Program administered by Airports Council International (ACI). Logan Airport recently entered the ACA program and has achieved Level 1 – Mapping. The ownership categorization and the emission sources by scope are detailed in **Table 8-7**.

Table 8-7 Logan Airport Greenhouse Gas Emissions (GHG) Emission Sources by Scope

Scope	Source
Scope 1 – Emissions from sources that are owned and/or controlled by Massport	Massport fleet vehicles and equipment (i.e., Massport ground service equipment, Massport shuttles, and Logan Express buses)
	Stationary sources (includes generators, boilers, etc.)
	Fire training
Scope 2 - Emissions associated with the generation of electricity consumed but generated offsite at public utilities	Electricity consumption (Massport, tenant, and common areas)[1]
Scope 3 - Emissions from sources that are public and tenant owned and controlled	Aircraft (on-ground, within the landing and takeoff up to 3,000 feet)[2]
	Auxiliary Power Units
	Ground Service Equipment
	Passenger and Employee Transportation[3] including On-Airport Parking Lots

Sources: National Academies of Sciences, Engineering, and Medicine 2009, Transportation Research Board, Airport Cooperative Research Program, Report 11: Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories, Washington, D.C.: The National Academies Press, https://nap.nationalacademies.org/catalog/14225/guidebook-on-preparing-airport-greenhouse-gas-emissions-inventories, and CMT.

Notes: LTO - landing and takeoff cycle.

1 Aircraft cruise mode emissions above the 3,000-foot atmospheric mixing height are not included.

2 Per ACRP Report 11 and for consistency with prior EDR/ESPR inventories, emissions associated with the generation of electricity consumed but generated offsite at public utilities are considered Scope 2.

3 Passenger and employee transportation are off- and on-Airport employee, tenant, and public vehicle trips, which includes private automobiles, taxis, limousines, buses, shuttle vans, etc.

Table 8-8 presents the 2022 GHG emissions inventories, respectively. The emissions are broken out by Scope and reported in equivalent values of MT CO_2e.[9] As shown, in 2022 Massport-controlled emissions and purchased electricity (Scopes 1 and 2, respectively) represent 12.7 percent of airport-wide GHG emissions, and Scope 3 emissions, which are public and tenant-owned and controlled, represent the remaining 87.3 percent of GHG emissions.

9 CO_2 equivalent values are based upon the GWP values of 1 for CO_2, 28 for CH_4, and 265 for N_2O (based on a 100-year period) as presented in the IPCC Fifth Assessment Report (2014).

Table 8-8 Estimated Greenhouse Gas Emissions (GHG) Inventory (in MT of CO_2e) by Scope at Logan Airport, 2022

Scope	Source	CO_2	N_2O	CH_4	Totals
Scope 1 – Emissions from sources that are owned and/or controlled by Massport	Massport ground service equipment[1]	4,441	10	5	4,456
	Massport shuttle bus	1,483	4	2	1,488
	Massport Logan Express bus	4,086	8	5	4,099
	Stationary sources[2]	21,298	14	12	21,324
	Fire training	47	<1	<1	47
Total Scope 1 Emissions (5.4%)		**31,355**	**36**	**24**	**31,415**
Scope 2 – Emissions associated with the generation of electricity consumed but generated offsite at public utilities	Massport	4,524	23	18	4,564
	Tenant/Common area	37,950	190	149	38,289
Total Scope 2 Emissions (7.3%)[3]		**42,474**	**213**	**167**	**42,853**
Scope 3 – Emissions from sources that are public and tenant owned and controlled	Aircraft – Ground[4]	190,267	1,549	12	191,828
	Aircraft – Ground to 3,000 feet[5,6]	231,360	1,883	18	233,260
	Aircraft – Engine Startups s	4,492	37	5	4,534
	Auxiliary power units (APU)	10,439	85	12	10,536
	Ground service equipment (GSE)	13,362	192	28	13,582
	Passenger and employee transportation[7]	51,047	134	35	51,216
	On-Airport parking lots[8]	6,465	28	2	6,496
Total Scope 3 Emissions (87.3%)		**507,433**	**3,908**	**112**	**511,452**
Total Logan Airport Emissions (100%)[9]		**581,262**	**4,156**	**302**	**585,720**
Percent of Statewide Totals[10]		**<1.0%**	**<1.0%**	**<1.0%**	**<1.0%**

Source: Massport and CMT, 2023.

Notes: MT - metric tons of CO_2 equivalents (1 MT = 1.1 Short Tons). CO_2 equivalents (CO_2e) are bases for reporting the three primary GHGs (e.g., CO_2, N_2O, and CH_4) in common units. Quantities are reported as "rounded" and truncated values for ease of addition.

CO – carbon monoxide; NO_X – oxides of nitrogen; CH_4 – methane.

1 Ground service equipment includes Massport-owned ground service vehicles.

2 Stationary sources include Central Heating Plant, emergency generators, snow melters, and the distributed building heating and cooling network.

3 Scope 2 emissions from electricity consumption occur off-Airport at power generating plants.

4 Aircraft – Ground emissions include taxi-in, taxi-out, and ground-based delay emissions based on AEDT fuel usages.

5 Aircraft – Ground to 3,000 feet include takeoff, climb out, and approach emissions up to a height of 3,000 feet based on AEDT fuel usages.

6 The U.S.EPA published that: "…methane is no longer considered to be an emission from aircraft gas turbine engines burning Jet A at higher power settings and is, in fact, consumed in net at these higher powers." [Reference: EPA, Recommended Best Practice for Quantifying Speciated Organic Gas Emissions from Aircraft Equipped with Turbofan, Turbojet, and Turboprop Engines, May 27, 2009 [EPA-420-R-09-901], https://nepis.epa.gov/Exe/ZyPDF.cgi/P1003YX3.PDF?Dockey=P1003YX3.PDF.

7 Passenger and Employee Transportation includes off- and on-Airport employee/tenant/public vehicle trips.

8 The On-Airport parking lots category represents vehicles idling at terminal curbsides and parking garages/lots/areas.

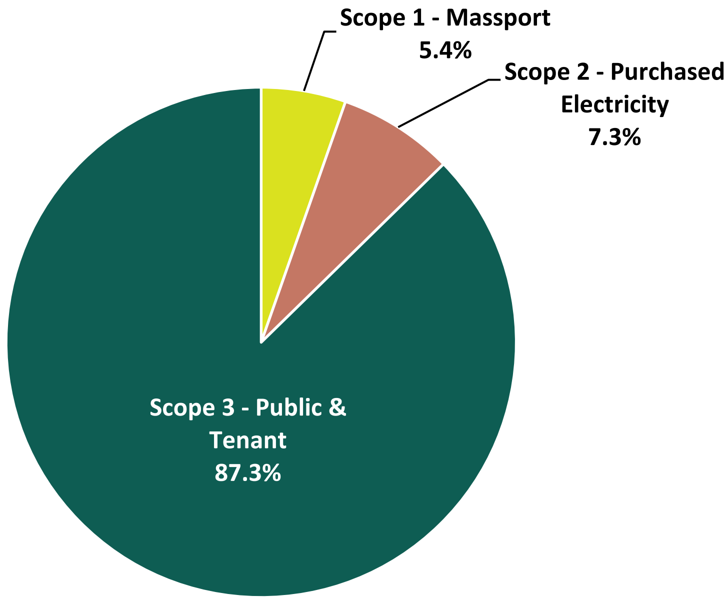
9 Total Emissions = Scope 1 + Scope 2 + Scope 3.

10 Percentage based on relative amount of total emissions to 2019 (latest available) statewide total from MassDEP, 2nd Addendum to the Statewide Greenhouse Gas Emissions Level: 1990 Baseline Update, June 2022, available at https://www.mass.gov/doc/2nd-addendum-to-statewide-ghg-level-proposed-1990-baseline-update-june-2022/download.

As in previous years, the 2022 GHG emission inventories Scope 3 (e.g., aircraft, GSEs and APUs) represented the largest source of Logan Airport emissions, followed by Scope 2 (i.e., electricity consumption), and Scope 1 (e.g., stationary sources, airport fleet vehicles), as shown in **Figure 8-9**.

Overall, total GHG emissions in 2022 increased from 2021 levels but remained well below 2019 levels. The changes in GHGs are directly attributable to increases/decreases in operational and passenger activity levels. Furthermore, GHG emissions associated with Logan Airport in 2022 represent less than 1 percent of the most recent statewide emissions estimates,[10] and approximately 9 percent of Boston's citywide emissions.[11] Massport plans to continue updating its GHG Emissions Inventory for Logan Airport annually.

Figure 8-9 Sources of GHG Emissions by Scope, 2022



Source: Massport and CMT, 2023.

Notes: Scope 1 emissions are from sources that are owned or controlled by Massport (i.e., ground support vehicles, Massport shuttles, on-Airport traffic, and stationary sources), Scope 2 emissions are from electricity consumption (both Massport and tenant), which are generated off-Airport at power generating plants, and Scope 3 emissions are from aircraft, ground service equipment (GSE) including auxiliary power units (APUs), and ground transportation to and from the Airport.

10 2020 and 2021 percentages are based on relative amount of Airport total of direct emissions to 2019 statewide totals. 2019 statewide totals are derived from MassDEP's 2nd Addendum to the Statewide Greenhouse Gas Emissions Level: 1990 Baseline Update (June 2022) report, available at https://www.mass.gov/doc/2nd-addendum-to-statewide-ghg-level-proposed-1990-baseline-update-june-2022/download.

11 City of Boston, Boston Community GHG Emissions, updated March 21, 2022, https://www.boston.gov/departments/environment/bostons-carbon-emissions.

Table 8-9 Comparison of Estimated Total Greenhouse Gas (GHG) Emissions (MT CO2e) by Scope at Logan Airport – 2017 through 2022

Scope	2017	2018	2019	2020	2021	2022
Scope 1 Emissions	49,305	47,493	51,360	32,764	33,067	31,415
Scope 2 Emissions	48,448	44,716	43,226	39,949	38,711	42,853
Scope 3 Emissions	607,794	685,465	713,539	247,530	321,388	511,452
Total Emissions[1]	**705,547**	**777,674**	**808,125**	**320,242**	**393,166**	**585,720**
Percent of State Totals[2]	**<1%**	**1%**	**1%**	**<1%**	**<1%**	**<1%**

Source: Massport and CMT, 2024.

Notes: Totals may not add exactly due to rounding.

MT – metric tons of CO_2 equivalents (1 MT = 1.1 Short Tons). CO_2 equivalents (CO_2e) are bases for reporting the three primary GHGs (e.g., CO_2, N_2O, and CH_4) in common units. Quantities are reported as "rounded" and truncated values for ease of addition.

1 Total Emissions = Scope 1 + Scope 2+ Scope 3.

2 Percentage based on most recent relative amount of total emissions to statewide total from MassDEP, MassDEP, 2nd Addendum to the Statewide Greenhouse Gas Emissions Level: 1990 Baseline Update, June 2022, available at https://www.mass.gov/doc/2nd-addendum-to-statewide-ghg-level-proposed-1990-baseline-update-june-2022/download.

Table 8-9 provides GHG data for Logan Airport from 2017 through 2022 by scope and compares the emissions to statewide totals, in MT CO_2e. Estimated total GHG emissions at Logan Airport from 2007 through 2022 are provided in the *2020/2021 EDR*, published in November 2022.

Reduced GHG Scope 1 emissions are generally attributed to Logan Airport facilities and equipment operating more efficiently over time, as Massport is shifting to cleaner fuel sources for fleet vehicles and other Massport-controlled equipment. Further details on Logan Airport's building efficiency are provided in Appendix J, Section J.5.

8.4 Emissions Inventory in the Future Planning Horizon

For this 2022 ESPR, Massport updated the Logan Airport long-range forecast to represent a Future Planning Horizon of 10 to 15 years in the future (see Chapter 3). The updated Future Planning Horizon assumes an air passenger activity level of 53.5 MAP which is anticipated to occur in the next 10 to 15 years. Emissions of VOCs, CO, NO_X, $PM_{10}/PM_{2.5}$, and GHGs were modeled for the Future Planning Horizon based on the projected future passenger levels.

The number of aircraft operations forecasted for the future condition (495,000 operations) is greater than in 2022 (378,613 operations). This forecast is slightly higher (1.4 percent higher) than the level of total aircraft operations in 2000 (487,996 operations) but still well below the peak of 507,449 in 1998. These aircraft operations forecasts, along with future Airport activity assumptions pertaining to airfield operating conditions, aircraft fleet mix, GSE and APU usage, and fuel type and throughput volumes, were used to calculate the future emissions inventory. Although there are projected increases in aircraft emissions due to increased flights, these are partially offset by the decreases in emissions from GSE and motor vehicles, primarily due to anticipated fuel-efficient motor vehicles and the Massport and tenants' goal to convert commercially available GSE to eGSE by the end of 2027. In addition, the future emissions inventory represents a conservative analysis. Actual future emissions are anticipated to be lower than the predicted values because this forecast does not assume emissions reduction due to technology advancements.

8.4.1 Future Fleet Mix, VMT, and Operations Assumptions

There are several limitations on the predictive ability of air quality models relating to years as distant as 10 to 15 years out. For example, the FAA's AEDT model used to calculate the aircraft and GSE analyses is often updated by FAA but these updates do not account for future-year technological changes. The EDRs and ESPRs update assumptions and technological advances as they are available. The modeling used to calculate the future emissions inventory makes the following assumptions:

- As with the 2022 emissions inventory, the most recent version, AEDT3e, was used to compute the future Logan Airport emissions inventory. While current aircraft and motor vehicle engine technologies are likely to change, become more efficient, and use alternative fuels in the future, these changes cannot feasibly be accounted for, and thus are not included in the model. Similarly, the modeled aircraft reflect current technologies and cannot adequately characterize the low-emissions profiles of certain developing engine technologies. Thus, the predicted emissions represent a conservative estimate (likely over-estimate) of future conditions.
- LTOs are forecasted to increase by approximately 31 percent compared to 2022 (189,307 to 247,501), with overall air carrier LTOs increasing by approximately 44 percent (119,167 to 171,709), commuter LTOs increasing by approximately 2 percent (48,292 to 49,028), air cargo LTOs decreasing by approximately 8 percent (7,344 to 6,725), and GA increasing by approximately 38 percent (14,504 to 20,039). Appendix J, Section J.4.2, contains the input data that were used, including aircraft types, engines, LTOs, and assumed aircraft taxi/delay times.
- APU emissions assumed that all existing and future contact gates will be equipped with PCA and/or 400-Hz power. GSE were assumed to be 98 percent converted to eGSE by the Future Planning Horizon.
- Aircraft taxi times for the Future Planning Horizon were developed from the recent **Boston-Logan Runway Incursion Mitigation (RIM) Study** and FAA's ASPM database, which provides the use of the Airport for each of the main runway configurations. The average taxi time assumed for the Future Planning Horizon is approximately two minutes less than the times reported for 2022.
- As with 2022, motor vehicle emission factors for the Future Planning Horizon were obtained from the most recent version of U.S.EPA's MOVES model (MOVES3.1) and were combined with MassDEP-recommended motor vehicle fleet mix data, operating conditions, and other Massachusetts-specific input parameters. The MOVES model reflects the continuous reduction in

motor vehicle emissions over time. MOVES input and output files are included in Appendix J, Section J.4.4.

- Emissions associated with fuel storage and handling, the Central Heating Plant, snow melters, emergency generators, space heaters, and fire training at Logan Airport are based largely on fuel throughput, and are expected to become more fuel-efficient, less fossil fuel-dependent, and emit fewer emissions in the Future Planning Horizon. Massport Emissions from boilers, emergency generators, and space heaters were estimated using the average fuel throughput for the past five years, combined with the anticipated increase in Terminal building square footage. Emissions from snow melters and fire training were also based on the past five-year average usage. In addition, it was assumed that snow melters would have a 50 percent shift in usage from diesel to natural gas by the Future Planning Horizon. The same emission factors used in 2022 were also assumed for the future condition. Finally, the near-term upgrading and replacement of the heating plant boilers are also expected to reduce emissions beyond what is predicted. At the time of this filing, Massport is piloting renewable diesel. Assumptions pertaining to the transition to renewable diesel will be incorporated into the analysis in future EDRs and ESPRs.

8.4.2 Criteria Air/Precursor Pollutant Future Emission Inventory Results

Due to the conservative nature of the modeling assumptions, the results of the future emissions inventory, which are shown in **Table 8-10**, should be considered reasonable, but may be conservatively high, since the calculations are based on currently known information. As such, the outcome is subject to refinement as more accurate emissions data become available in the future and will be updated with future ESPRs.

Changes in emissions are a function of the number of aircraft operations, fleet mix, taxi times, GSE emission factors, motor vehicle volumes and emission factors, stationary source fuel usage, and other sources. In some cases, these data result in differing effects. For example, taxi times influence aircraft VOC and CO; the number of operations largely influences NO_X; and the number of GSE serving the aircraft fleet influences $PM_{10}/PM_{2.5}$. The following bullets summarize the future criteria air and precursor pollutant emissions findings:

VOC emissions are expected to be **8 percent less** over the Future Planning Horizon compared to 2019.

- In the Future Planning Horizon, Airport sources of VOCs, NO_X, $PM_{10}/PM_{2.5}$, and CO will continue to stay well below the criteria pollutant thresholds and are expected to decrease substantially compared to 1990 levels.
- Total modeled emissions of VOCs are expected in the Future Planning Horizon to be 8 percent lower than in 2019. This increase is attributable to the assumed change in aircraft fleet mix and the increase in aircraft operations. However, conversion of 98 percent of GSE to eGSE, and lower motor vehicle emission factors in the Future Planning Horizon are expected to drive emissions from these sources to decrease significantly. Notably, GSE and motor vehicle emissions are anticipated to decrease by 73 percent and 43 percent, respectively.

- Total modeled emissions of NO_X are predicted to be about 53 percent higher than in 2022 and 39 percent higher than in 2019.
  - The increase from 2022 is almost entirely a result of the changing aircraft fleet (i.e., greater use of quieter but higher NO_X-emitting aircraft) and the forecasted increase in operations.
  - The increases from 2019 are primarily due to a combination of fleet mix changes, an increase in annual operations, and differences in AEDT models.
- The current projections for the future do not incorporate technological innovations that are likely to be in effect at that time, including the introduction of aircraft engines, which will be more efficient, cleaner, and quieter. Therefore, with more operations and higher-emitting engines in the current database, the predicted NO_X emissions from aircraft are likely to be conservatively high.
  - The majority of NO_X emissions from aircraft originate from high-temperature, high-pressure reactions of atmospheric nitrogen in aircraft engines. Over time, aircraft engine technology has evolved to be more fuel-efficient, less polluting, and quieter, in large part, due to improved fuel combustion under these higher temperature and pressure conditions. This interdependency, or trade-off, between increased NO_X and better fuel efficiency, lower emissions for other pollutants (including CO_2), and less noise, is an inevitable outcome of the modernization of the commercial air carrier fleet. Aircraft engine manufacturers are continually advancing combustion technology that is designed to moderate the production of NO_X.
  - As previously discussed, VOCs and NO_X are the two main pollutants involved in ozone formation. In VOC-limited areas such as Boston, NO_X emissions play a lesser role in ozone formation than VOCs. Ozone formation is impacted more by VOCs than by NO_X. Therefore, the forecasted increases in NO_X emissions associated with Logan Airport must be interpreted with the context of a long-term decrease in VOC emissions; the relationship between increasing emissions of NO_X and decreasing emissions of VOCs represents a potential moderation to the ozone-forming potential of increasing NO_X emissions.
- Total modeled future emissions of CO are predicted to be about 10 percent lower compared to 2022 and 30 percent lower than in 2019. This overall reduction is primarily due to anticipated deployment of fuel-efficient motor vehicles and the Massport's and tenants' commitment to converting all GSE to eGSE by this time period.
- Total modeled future emissions of $PM_{10}/PM_{2.5}$ are expected to be approximately the same as 2022 levels and remain higher than 2019 levels due to higher emission factors between the two model versions used in the analyses (i.e., MOVES3.1 used in 2035/2022 versus MOVES2014b used in 2019).

The estimated emission totals for the Future Planning Horizon are expected to be measurably less for CO than the values reported in 2022, but higher for VOC, $NO_{X,}$ and $PM_{10}/PM_{2.5}$ due to the characteristics of the aircraft fleet and increases in motor vehicle activity. The current version of AEDT, which was used to calculate the future emissions inventory, does not reflect the significant design and operational improvements in aircraft engine technologies, alternative fuels, and aircraft operational measures, which will lead to lower fuel use, improved combustion efficiencies, and lower emissions.

Table 8-10 Future Planning Horizon Emission Estimates (in kg/day) at Logan Airport

Source Categories	VOC		NO_X		CO		$PM_{10}/PM_{2.5}$	
	2022	Future	2022	Future	2022	Future	2022	Future
Aircraft Sources								
Air carriers	422	434	4,834	8,095	3,042	3,614	39	44
Commuter aircraft	93	64	322	352	1,849	1,265	3	3
Cargo aircraft	85	93	423	370	393	364	3	3
General aviation (GA)	80	169	71	63	302	341	2	2
Total Aircraft Sources	**681**	**760**	**5,650**	**8,881**	**5,586**	**5,584**	**47**	**52**
Ground Service Equipment (GSE)[2]	**27**	**7**	**123**	**52**	**522**	**63**	**11**	**6**
Motor Vehicles								
Parking / curbside[1]	4	1	2	<1	10	2	1	1
On-Airport vehicles	19	11	5	3	312	164	49	52
Total Motor Vehicle Sources	**22**	**13**	**7**	**4**	**322**	**166**	**50**	**53**
Other Sources								
Fuel storage and handling[2]	410	410	-	-	-	-	-	-
Miscellaneous sources[3]	5	2	86	21	20	5	3	1
Total Other Sources	**415**	**412**	**86**	**21**	**20**	**5**	**3**	**1**
Total Airport Sources	**1,144**	**1,191**	**5,866**	**8,958**	**6,449**	**5,818**	**112**	**112**
Percent Change		**4.1**		**52.7**		**-9.8**		**0.3**

Source: Massport and CMT, 2024.

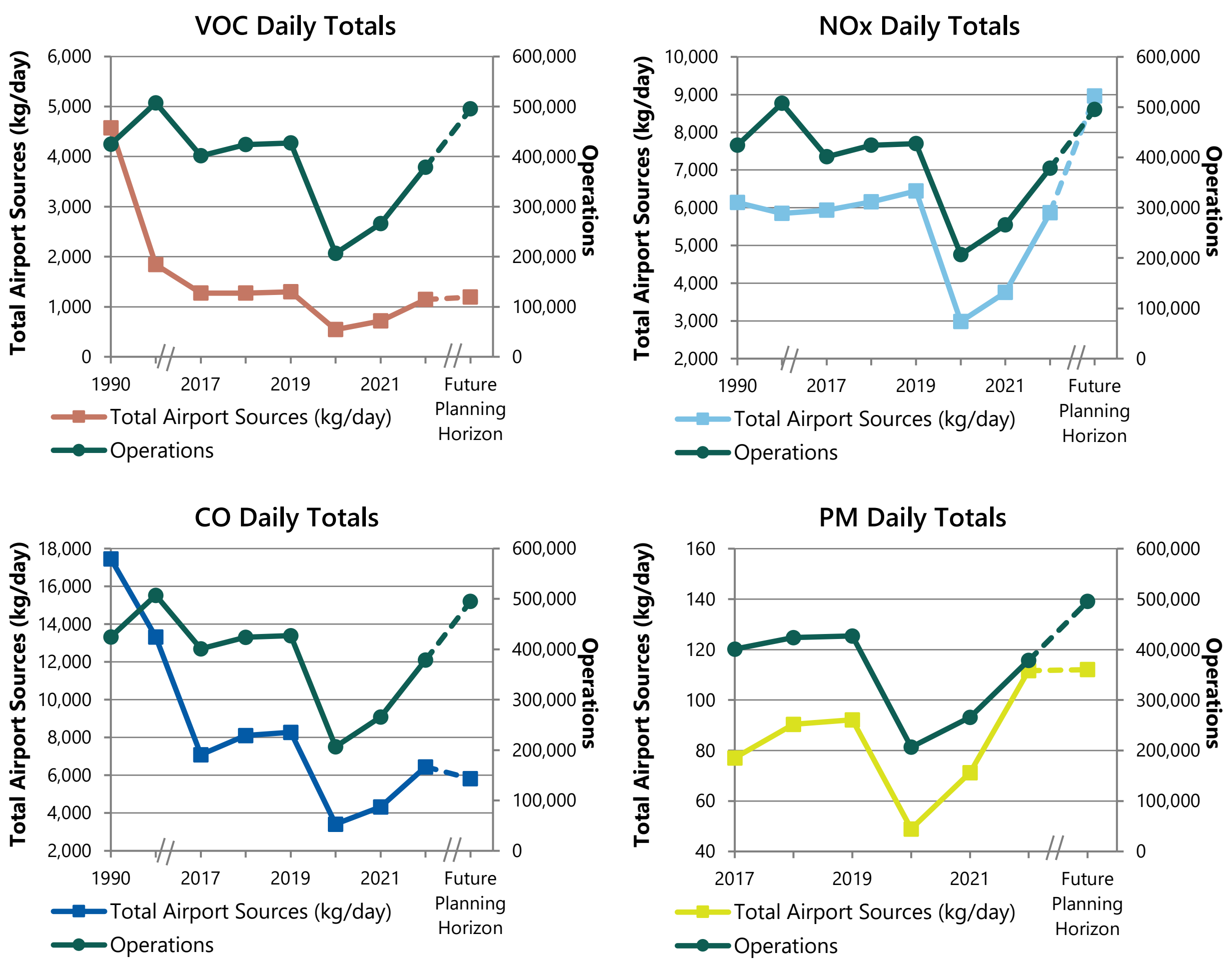
Notes: Values may reflect rounding.
kg/day - kilograms per day. 1 kg/day is equivalent to approximately 0.40234 tons per year (tpy).
CO – carbon monoxide; NO_X – oxides of nitrogen; $PM_{10}/PM_{2.5}$ – particulate matter with a diameter that is 10 micrometers and smaller (PM_{10}) which is inclusive of particulate matter with a diameter that is 2.5 micrometers and smaller ($PM_{2.5}$); VOCs – volatile organic compounds.

1 GSE emissions include aircraft auxiliary power units (APUs) and vehicles and equipment converted to alternative fuels.
2 Includes the Central Heating Plant, emergency electricity generation, snow melter usage, and other stationary sources.
3 Fuel storage and handling activities do not emit CO and therefore, are not included in the table.

8.4.2.1 Historical Context and Trends

This section provides a summary of Logan Airport's long-range emissions levels for VOCs, CO, NO_X, and $PM_{10}/PM_{2.5}$ from 1990 to the Future Planning Horizon. As shown, long-range emissions levels at Logan Airport have decreased since 1990, except for NO_X. Decreases in emissions are due to improvements in aircraft and motor vehicle engine combustion technologies, as well as improvements to the Airport such as the Logan Airside Improvements Project. Increases in NO_X emissions are predominantly due to an increase in aircraft operations (424,568 in 1990 and 495,001 in the future), as well as the AEDT model assumptions, resulting in higher NO_X emissions compared to the legacy tool EDMS. The emission trends for VOCs, NO_X, CO, and PM from 1990 to the Future Planning Horizon are shown in **Figure 8-10** and operational levels at the Airport are also shown for comparative purposes.

Figure 8-10 Emission Trends of VOCs, NOx, CO, and PM[1] at Logan Airport, 1990-Future Planning Horizon



Source: Massport and CMT, 2024.
Notes: The dashed line represents projected values
CO – carbon monoxide; NO_X – oxides of nitrogen; PM – particulate matter; VOC – volatile organic compounds.
1 PM emissions were not estimated until 2005.

8.4.3 Greenhouse Gas Future Emission Inventory Results

As with the 2022 analysis, the future GHG emission inventory is based on guidance developed by the Transportation Research Board's (TRB) Airport Cooperative Research Program (ACRP) and the ACI's ACA Program to compute GHG emissions. Thus, the projection of future GHG emissions assigns GHG emissions based on Scopes 1, 2, and 3, which are based on ownership or control.

The expected increase in operations in the Future Planning Horizon is partially offset by greater motor vehicle and GSE electrification, associated with advancements in equipment technology on a nationwide basis and regulatory requirements. Initiatives are underway within the U.S. and internationally to reduce aviation's contribution to global GHG emissions. Such initiatives include new aircraft technologies to reduce emissions and improve fuel efficiency, renewable alternative fuels with lower carbon footprints, more efficient air traffic management, market-based measures, and environmental regulations including an aircraft CO_2 standard.

GHG reductions were accounted in the Future Planning Horizon emissions inventory due to the expected transition to 10 percent SAF usage by airlines based on FAA projections.[12] The primary GHG emission reductions associated with the use of SAF occur over the lifecycle of the fuel. The lifecycle emissions of a fuel include the production, extraction, transport, and final burning of the fuel into exhaust. Further information on SAF and the methodology used to estimate its reductions is detailed in Appendix J.

Table 8-11 presents the predicted Future Planning Horizon GHG emissions inventory reported in MT CO_2e. Note that this Future Planning Horizon comes after Massport's Net Zero by 2031 commitment. Accordingly, the estimated remaining Scope 1 and Scope 2 emissions presented below will be negated through the use of offsets and renewable energy certificates (RECs), and where possible, Massport will be looking to ensure that the benefits of these economic mechanisms for reducing emissions are accrued in the State. Such mechanisms will not be purchased after 2040, at which point Massport has committed to reducing its Scope 1 and Scope 2 to zero in absolute terms.

12 FAA. Sustainable Aviation Fuels (SAF). March 18, 2024. https://www.faa.gov/about/officeorg/headquartersoffices/apl/sustainable-aviation-fuelssaf#:~:text=U.S.%20Aviation%20Decarbonization%20Goals&text=By%202030%2C%20industry%20produces%20at,35%20billion%20gallons%20per%20year.

Table 8-11 Estimated Greenhouse Gas Emissions (GHG) Inventory (in MT CO_2e) by Scope at Logan Airport, Future Planning Horizon

Scope	Source	CO_2	N_2O	CH_4	Totals
Scope 1 – Emissions from Sources that are Owned or Controlled by Massport	Massport Ground Service Equipment[1]	95	0	0	95
	Massport Shuttle Bus	2,199	5	3	2,206
	Massport Logan Express Bus	-	-	-	-
	Stationary Sources[2]	1,291	1	1	1,293
	Fire Training	46	0	0	47
Total Scope 1 Emissions (0.6%)		**3,630**	**7**	**4**	**3,641**
Scope 2 - Emissions Associated with the Generation of Electricity Consumed	Massport	5,008	25	20	5,053
	Tenant/Common Area	42,008	211	165	42,383
Total Scope 2 Emissions (7.5%)[3]		**47,016**	**236**	**184**	**47,436**
Scope 3 - Emissions from Sources that are Public and Tenant Owned and Controlled	Aircraft – Ground[4]	234,289	1,909	9	236,207
	Aircraft – Ground to 3,000 feet[5,6]	322,977	2,632	10	325,619
	Aircraft - Engine Startups	5,840	48	7	5,895
	Aircraft (SAF)[7]	-43,707	-	-	-43,707
	Auxiliary Power Units (APUs)	7,797	64	9	7,869
	Ground Service Equipment (GSE)	349	5	1	355
	Passenger and Employee Transportation[8]	43,952	118	20	44,090
	On-Airport Parking Lots[9]	6,108	28	2	6,137
Total Scope 3 Emissions (91.9%)		**577,605**	**4,802**	**57**	**582,464**
Total Logan Airport Emissions (100%)[10]		**628,251**	**5,045**	**246**	**633,542**

Source: Massport and CMT, 2024.

Notes: MT - metric tons of CO_2 equivalents (1 MT = 1.1 Short Tons). CO_2 equivalents (CO_2e) are bases for reporting the three primary GHGs (e.g., CO_2, N_2O, and CH_4) in common units. Quantities are reported as "rounded" and truncated values for addition. CO – carbon monoxide; NO_X – oxides of nitrogen; PM_{10}/$PM_{2.5}$ – particulate matter with a diameter that is 10 micrometers and smaller (PM_{10}) which is inclusive of particulate matter with a diameter that is 2.5 micrometers and smaller ($PM_{2.5}$); VOCs – volatile organic compounds.

1 GSE includes the Logan Airport fleet.

2 Stationary sources include Central Heating Plant boilers, other boilers, emergency generators, and snow melters.

3 Scope 2 emissions from electrical consumption occur off-Airport at power generating plants. Emissions associated with electricity are expected to be completely reduced or avoided through the combination of onsite solar, power purchase agreements, and the purchase of renewable energy credits, as needed

4 Aircraft – Ground emissions include taxi-in, taxi-out, and ground-based delay emissions based on AEDT fuel usage.

5 Aircraft – Ground to 3,000 feet include takeoff, climb out, and approach emissions up to a height of 3,000 feet based on AEDT fuel usages.

6 The EPA published that: "…methane is no longer considered to be an emission from aircraft gas turbine engines burning Jet A at higher power settings and is, in fact, consumed in net at these higher powers." [Reference: EPA, Recommended Best Practice for Quantifying Speciated Organic Gas Emissions from Aircraft Equipped with Turbofan, Turbojet, and Turboprop Engines, May 27, 2009 [EPA-420-R-09-901], https://nepis.epa.gov/Exe/ZyPDF.cgi/P1003YX3.PDF?Dockey=P1003YX3.PDF.

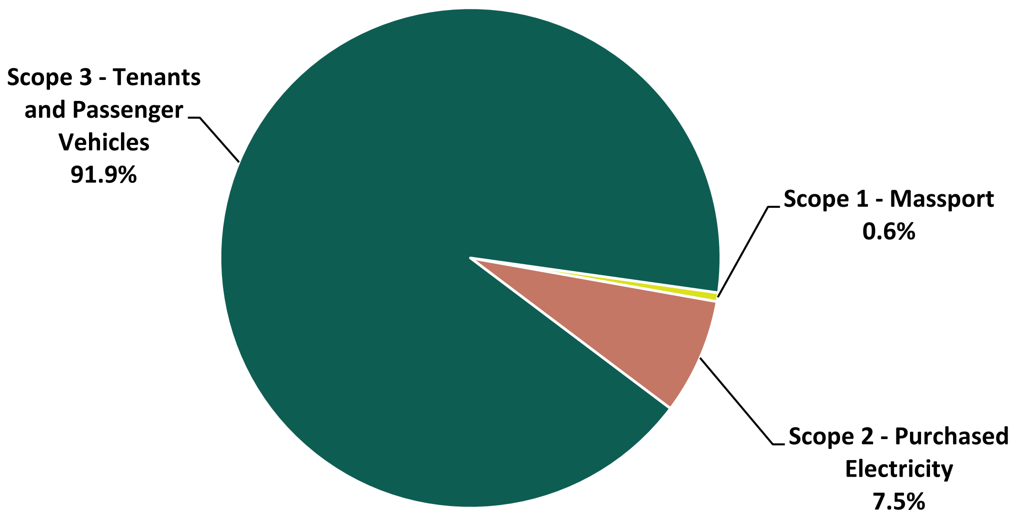
7 GHG reductions associated with the use of Sustainable Aviation Fuels (SAFs). Massport anticipates that 10 percent of airlines' total fuel usage will be converted to SAF by 2030.

8 Passenger and Employee Transportation includes off- and on-Airport employee/tenant/public vehicle trips.

9 The On-Airport parking lots category represents vehicles idling at terminal curbsides and parking garages/lots/areas.

10 Total Emissions = Scope 1 + Scope 2 + Scope 3.

Figure 8-11 Sources of GHG Emissions, Future Planning Horizon



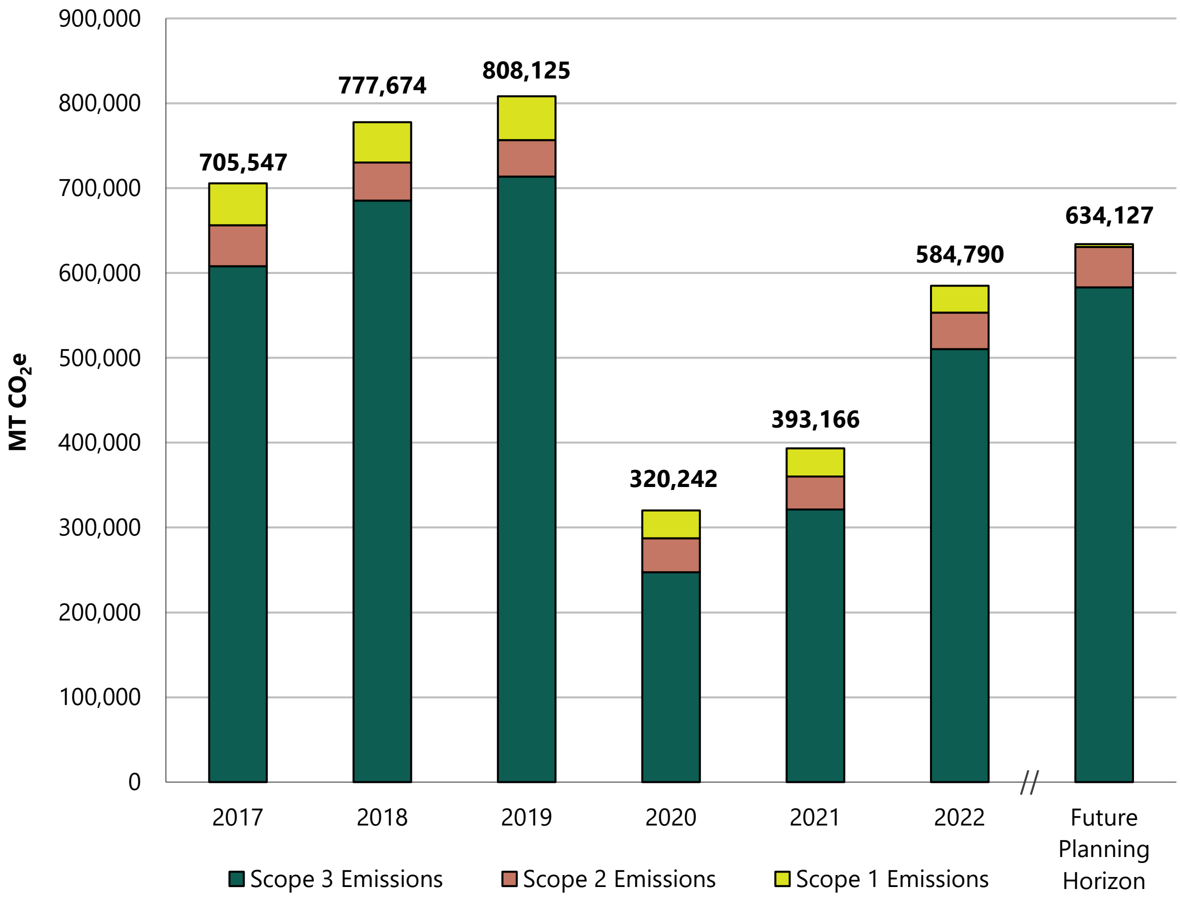
Source: Massport and CMT, 2024

Note: Scope 1 emissions are from sources that are owned or controlled by Massport, Scope 2 emissions are from electrical consumption, which are generated off-Airport at power generation plants, and Scope 3 emissions are from Airport tenants and the ground transportation to and from the Airport.

As shown in **Figure 8-11**, before the expected application of carbon offsets and RECs, the Future Planning Horizon Massport-related emissions (Scope 1) are expected to represent less than 1 percent of total GHG emissions at the Airport. Tenant and passenger-based emissions (Scope 3) are anticipated to represent about 92 percent; and electrical consumption from Massport, common areas, and tenants (Scope 3) are anticipated to represent less than 8 percent of total GHG emissions.

As shown in **Figure 8-12**, before the expected application of carbon offsets and RECs, total future GHG emissions are estimated to be approximately 8 percent higher than 2022 levels. This increase is attributable to the forecasted approximate 31 percent increase in aircraft operations and 29 percent increase in vehicular traffic, each increasing fuel usage and VMT and associated Scope 3 emissions. The projected increases in aircraft emissions due to increased flights will be partially offset by the anticipated use of SAF, and the projected increases in vehicular traffic will be partially offset by anticipated fuel-efficient motor vehicles and Massport's goal to convert commercially available GSE to eGSE. Scope 1 emissions (Massport) are predicted to decrease by 88 percent due to the electrification of the majority of these sources, including Massport Shuttle Buses and Logan Express Buses, distributed stationary sources, and GSE. Scope 2 (purchased electricity) is predicted to increase slightly due to the projected Terminals B, C, and E area expansion.

Figure 8-12 Emissions of GHG at Logan Airport 2010-2017, Future Planning Horizon



Source: Massport and CMT, 2024

Note: Scope 1 emissions are from sources that are owned or controlled by Massport, Scope 2 emissions are from electrical consumption, which are generated off-Airport at power generation plants, and Scope 3 emissions are from Airport tenants and the ground transportation to and from the Airport.

8.5 Air Quality and GHG Management Plan

Massport's air quality and GHG management strategy for Logan Airport focuses on decreasing emissions from Airport-related sources, in addition to furthering innovative means to achieve emissions reductions Airport-wide. Massport's air quality and GHG improvement goals, the measures proposed to accomplish them, and some of the 2022 milestones are listed in **Table 8-12**. Massport continues to comply with the **Logan Airport Parking Freeze**,[13] in accordance with 10 Code of Massachusetts Regulations 7.30 and 40 Code of Federal Regulations 52.1135. Chapter 6, Section 6.4.1, provides detailed discussion of

13 310 Code of Massachusetts Regulations 7.30 and 40 Code of Federal Regulations 52.1120.

Massport's compliance with the Parking Freeze regulations, and the counterproductive effect of constrained parking at Logan Airport on VMT and associated emissions.

Table 8-12 Air Quality Management Strategy Status

Air Quality Emissions Reduction Goals	Plan Elements	2022 Status
Reduce emissions from Massport/Tenant fleet vehicles	Convert Massport and Tenant fleet vehicles to electric, hybrid, or other alternative fuel by retrofitting or through new procurements.	Massport initiated a fleet decarbonization assessment to review the Authority's existing on-road fleet inventory and to identify recommendations for electric vehicle (EV) replacements over a 15-year period beginning in 2024, while looking at the financial and environmental benefits of such transitions. The assessment is also identifying electric alternatives for Massport's off-road equipment.
Encourage use of alternative fuel and alternative power vehicles by private fleet and airside service vehicle owners	Provide infrastructure to support alternative fuels including electricity and green hydrogen.	Massport is facilitating the replacement of gas- and diesel-powered ground service equipment (GSE) with all-electric versions. SE equipment will continue to be replaced by electric alternatives where feasible. At the time of this filing, Massport is piloting renewable diesel use, which is a sustainable fuel replacement for fossil-fuel-based diesel. By the end of 2022, there were over 70 EV charging ports across Logan Airport available for use by shared-ride companies (i.e., RideApp companies, rental cars, taxis, and limousine vehicles) and the general public, with additional ports owned and proposed by rental car companies at the Rental Car Center (RCC). Massport continues to operate one of New England's largest retail compressed natural gas (CNG) stations, which is open to the public.
Encourage use of alternative fuel and alternative power vehicles by private fleet and airside service vehicle owners	Work with ground access fleet and airside service vehicle owners to encourage conversion.	Massport encourages conversion to alternative fuel vehicles/alternative power vehicles (AFVs/APVs) by others through such policies as 50 percent discounts in AFV/APV ground access fees to limousines, vans, and buses; and preferred parking for hybrid and AFVs/APVs at Logan Airport parking facilities. Massport currently provides free "high-speed" EV charging to RideApp companies and taxis serving Logan Airport. Massport is collaborating with the Massachusetts Clean Energy Center (MassCEC) to study opportunities to enable the conversion of ride-for-hire fleets serving Logan Airport to EVs. In early 2022, MassCEC provided a grant to initiate this work and provide funding to improve Logan Airport's EV charging infrastructure.

Table 8-12 Air Quality Management Strategy Status

Air Quality Emissions Reduction Goals	Plan Elements	2022 Status
Minimize emissions from motor vehicles	Implement a program to increase high-occupancy vehicle (HOV) ridership by air passengers and employees.	As described in detail in Chapter 6, *Ground Access*, Section 6.5, there are numerous high-occupancy vehicle (HOV) services at Logan Airport that are aimed at air passengers, including the Massachusetts Bay Transportation Authority (MBTA) Blue Line and Silver Line, Massport's Logan Express, and water transportation. Massport promotes the use of these services by employees and passengers, primarily through various pricing incentives. Massport has developed a robust strategy to increase HOV options and use. Massport has a goal of reaching 35.5 percent HOV by 2022, and 40 percent HOV by 2027. Massport achieved the 2022 goal with 38.4 percent HOV for the year. Massport provides free, clean-fuel shuttle bus service for passengers and employees between the MBTA Blue Line Airport Station, all terminals, the RCC, and the Logan Airport water transportation dock along Harborside Drive.
	Expand HOV options for Airport employees.	Massport continues to provide commuting information to all Airport employees including Sunrise and Logan Express Shuttles with reductions in employee parking. Logan Express extended service now provides nearly 24-hour service at several Logan Express locations, with significant discounts provided to Airport-wide and Massport employees. Since the COVID-19-related service adjustments in 2020 and 2021, Massport continues to restore, adjust, and augment HOV services.
	Encourage employees to use alternative transportation to commute.	Massport encourages employees to utilize public transit through a comprehensive employee transportation system. The system includes a 24/7 free shuttle bus service to the Terminals with off-Airport employee parking in Chelsea; shuttle buses connecting Airport Station to Southwest Service Area, South Cargo Area locations, and Terminals; early morning and late-night Logan Express bus trips; the Sunrise Shuttle that offers early morning services from East Boston, Winthrop, and Revere before the commencement of MBTA operations; subsidies for water transportation, transit use, and financial support for the Sunrise Shuttle; and discounted HOV and transit fare options. Massport includes bike racks or posts for securing bikes at all new facilities and at appropriate existing facilities to promote employees biking to work. Bicycle racks or posts for securing bikes are currently provided at the RCC, Terminal A, Terminal E, Logan Office Center, MBTA's Airport Station, Economy Parking Garage, Signature general aviation facility, and the Green Bus Depot (Bus Maintenance Facility, for authorized personnel).

Table 8-12 Air Quality Management Strategy Status

Air Quality Emissions Reduction Goals	Plan Elements	2022 Status
Minimize emissions from Construction Equipment	Incorporate Clean Air Construction Initiative (CACI) into major earthwork construction projects.	For all large construction projects, heavy construction equipment is required to be equipped with diesel particulate filters or diesel oxidation catalysts in accordance with CACI.
Reduce emissions from fuel vapor loss	Provide state-of-the-art fuel storage and distribution equipment.	A Fuel Storage and Distribution System is in operation to reduce the use of mobile fueling trucks and associated vapor losses.
	Implement Tank Management Program.	Refer to Chapter 9, *Water Quality*, which provides details regarding tank management and focuses on proper maintenance.
Reduce emissions from stationary sources	Employ Reasonable Available Control Technologies (RACT) for NO_X at the Central Heating Plant.	RACT policies have been implemented. A major focus of Massport's Net Zero by 2031 program is studying options for transitioning Logan Central Heating Plant from fossil fuel burning technologies. The Central Heating Plant is the largest single source of stationary emissions at Logan Airport.
	Use alternative fuels in snow melters.	Massport is required to use Ultra-Low Sulfur Diesel (ULSD) fuel in all Massport snow-melting equipment. Massport installed two new stationary snow melters using natural gas in 2016 and two additional snow melters became operational in December 2019. These installations will reduce the need for ULSD fuel-fired portable snow melters. At the time of this filing, Massport is piloting renewable diesel use, which is a sustainable fuel replacement for fossil-fuel-based diesel. This will primarily result in GHG emissions benefits; renewable diesel has also been shown to reduce PM, NO_X, CO, total hydrocarbons (THC), polycyclic aromatic hydrocarbons (PAHs), and VOCs.[3]

Table 8-12 Air Quality Management Strategy Status

Air Quality Emissions Reduction Goals	Plan Elements	2022 Status
Reduce emissions from stationary sources	Incorporate green building technologies and energy use reduction strategies.	By the end of 2022, Logan Airport had eight U.S. Green Building Council (U.S.GBC) Leadership in Energy and Environmental Design (LEED®) certified facilities: • Terminal A Redevelopment (the world's first LEED® certified airport terminal - 2006) • Green Bus Depot (LEED® Silver – 2014) • Rental Car Center (LEED® Gold - 2015) • Terminal E New Large Aircraft Wing (LEED® Gold - 2017 • Terminal B Gates 37-38 Connector (LEED® Gold - 2019) • Terminal B Optimization (LEED® Silver - 2022) • Terminal C to B Connector (LEED® Gold - 2023) Additionally, certification for Terminal E Modernization is pending. Aside from Massport-operated facilities, Logan Airport boasts the Signature Flight Support General Aviation (GA) Facility (LEED® certified) and the Nouria Service Center (LEED® Silver). An overview of sustainability initiatives is presented in Chapter 2 *Sustainability, Outreach, and Environmental Justice*.
	Install diesel particulate filters on large emergency generators.	Since 2011, Massport has voluntarily installed diesel particulate filters on all large (>500 kilowatts) stationary emergency generators.
Reduce aircraft emissions	Use of pre-conditioned air (PCA) at new and renovated terminals and terminal gates.	All contact gates have PCA and/or 400-Hz power. This reduces the time-in-mode (TIM) of auxiliary power units (APUs) and consequently reduces associated emissions. The recent improvements at Terminal B and the Terminal B-C Connector project and the new gates at Terminal E included the installation of PCA at all new/renovated gates.

Table 8-12 Air Quality Management Strategy Status

Air Quality Emissions Reduction Goals	Plan Elements	2022 Status
Reduce aircraft emissions	Work with FAA to study and implement airfield-improvement concepts and operational changes that may have air quality benefits.	Massport promoted such concepts through the *Logan Airside Improvements Planning Project*, which recommended physical and operational improvements to Logan Airport. Runway 14-32 became operational in November 2006 and the Centerfield Taxiway was fully opened in summer 2009. In 2006, 2009, and 2010, Massport conducted surveys to understand the extent of single-engine taxiing at Logan Airport and supported a more detailed survey by MIT in 2009. The surveys found that single-engine taxiing is an important measure used by airlines to conserve fuel • To better understand single-engine taxiing use, FAA issued a paper in March 2010. In January 2011, MIT published a paper on aircraft pushback control strategies to reduce congestion and taxi delays. • In addition to the MIT study on single-engine taxiing, Massport continues to: • Promote single-engine taxiing directly to chief pilots and airlines when safe. • Collaborate with MIT on national research on reducing departure queues on the airfield. Logan Airport-related work is complete and is now being tested at other airports. • Conduct a runway incursion mitigation study to include the potential for holding pads at appropriate locations to reduce aircraft queues at runway ends (closer to communities). • Manage an engine run-up location at the end of Runway 14-32 away from communities.
Reduce energy intensity and greenhouse gas (GHG) emissions while increasing portion of Logan Airport's energy generated from renewable sources	Increase the portion of Massport's energy generated from renewable sources. Reduce overall GHG emissions from Massport-operated mobile sources and energy consumed in Massport-operated facilities.	This goal was identified as part of the Logan Airport's *Sustainability Management Plan* (SMP),[2] which was released in April 2015. In the 2018 Annual Sustainability & Resiliency Report, Massport identified several policies and initiatives it is implementing to achieve this goal, including pursuing LEED® accreditation for new projects and upgrading to energy-efficient heating, ventilation, and air conditioning (HVAC) systems.

Source: Massport, 2024.

1 EPA, "National DERA Awarded Grants," https://www.epa.gov/dera/national-dera-awarded-grants.

2 Progress towards goals identified as part of the Logan Airport's SMP will be reported separately, as part of Massport's annual sustainability reporting.

3 State of California Environmental Protection Agency, "Multimedia Evaluation of Renewable Diesel," Renewable_Diesel_Multimedia_Evaluation_5-21-15.pdf (ca.gov).

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9. Water Quality

Operation of Logan Airport requires compliance with a range of state and federal regulations applicable to both Massport as the owner and operator as well as its tenants and users. This chapter outlines those regulations and presents Massport's approach to environmental management and its commitment to sustainability and responsible stewardship at Logan Airport. Through regular monitoring and documentation of water quality, stormwater, fuel use and storage, and soils, Massport assesses environmental performance at the Airport, and Massport is continually developing, implementing, evaluating, and adapting to improve policies and programs. This chapter reports on Massport's environmental programs at Logan Airport pertaining to environmental compliance and management and water quality, which include:

Environmental Management Policy

"Massport is committed to operate all of its facilities in an environmentally sound and responsible manner. Massport will strive to minimize the impact of its operations on the environment through the continuous improvement of its environmental performance and the implementation of pollution prevention measures, both to the extent feasible and practicable in a manner that is consistent with Massport's overall mission and goals."

- Implementing Logan Airport's *Sustainability Management Plan* (SMP);
- Enhancing water quality and stormwater management;
- Tracking fuel use and spills, as well as verifying mandated spill notifications to regulatory agencies, required cleanups, and documentation reporting are performed;
- Managing storage tanks and complying with regulations;
- Assessing and remediating sites pursuant to the **Massachusetts Contingency Plan (MCP)**;
- Conducting environmental inspections and implementing recommendations;
- Implementing the Logan Airport **Stormwater Pollution Prevention Plan (SWPPP)**, including engaging with co-permittees;
- Training for responsible personnel;

- ***Sustainability, and Resiliency Design Standards and Guidelines* (SRDSGs)** use by architects, engineers, and planners; and
- Implementing the **Spill Prevention Control and Countermeasures (SPCC) Plan** for applicable Logan Airport facilities that store petroleum products.

Massport also has compliance requirements pertaining to air quality; reporting and discussion regarding that program is provided in Chapter 8, *Air Quality and Greenhouse Gas Emissions*. **Table 9-1** includes a progress report for environmental compliance management in 2022.

Table 9-1 Progress Report for Environmental Compliance and Management

Plan Elements	Progress Report for 2022
Environmental Compliance Inspections	In 2022, Massport performed SWPPP inspections at its National Pollutant Discharge Elimination System (NPDES) co-permittees' operating areas (Logan facilities and Logan Airport tenants) and made recommendations on how to optimize best management practices (BMPs) during the inspections.
Stormwater Pollution Prevention Plan (SWPPP)	Massport conducted its annual SWPPP update meeting with its co-permittees in October 2022. The Logan Airport SWPPP addresses stormwater pollutants including deicing and anti-icing chemicals, bacteria, fuel and oil, and other sources of stormwater pollutants and includes BMPs specific to aviation activities. Massport also conducted training for personnel responsible for implementing activities identified in the SWPPP. The *2022 Annual Certificates of Compliance* were submitted jointly by Massport and the co-permittees to the U.S. Environmental Protection (U.S.EPA) and Massachusetts Department of Environmental Protection (MassDEP) in December 2022.
Design and Construction	Massport's *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) were developed to foster innovation and include clear targets to achieve more sustainable and resilient project designs and practices. As part of the SRDSGs, Massport aims to construct buildings at Logan Airport to achieve U.S. Green Building Council's (USGBC's) Leadership in Energy and Environmental Design (LEED®) Gold certification or higher. In 2022, Massport initiated preparations to update the SRDSGs. Massport requires contractors to comply with the U.S.EPA *NPDES Construction General Permit (CGP) for Stormwater Discharges from Construction Activities* for all construction projects impacting one or more acres. For smaller projects, Massport requires compliance with the Logan Airport SWPPP BMPs. For all construction projects, Massport requires the use of ultra-low-sulfur diesel fuel in construction equipment, construction waste recycling to the maximum extent possible, and retrofitting of construction equipment with pollution control devices, such as diesel oxidation catalysts or particulate filters.

Table 9-1 Progress Report for Environmental Compliance and Management

Plan Elements	Progress Report for 2022
Spill Prevention Control and Countermeasures (SPCC) Plans[2]	Massport maintains a Spill Prevention, Control, and Countermeasures (SPCC) Plan for its facilities that store petroleum products. Tenants meeting certain thresholds are required to prepare their own SPCC plans for their facilities. Massport checks for SPCC plans during environmental compliance inspections. Additionally, tenants receive information on Massport BMPs, which focus on spill management and prevention.

Source: Massport.

1 More information on the SRDSGs is provided in Chapter 2, *Sustainability, Outreach, and Environmental Justice*.

2 In accordance with the Clean Water Act, 40 Code of Federal Regulations 112, Oil Pollution Prevention.

9.1 Water Quality and Stormwater Management in 2022

Massport's primary water quality goal is to prevent or minimize pollutant discharges to stormwater, thus limiting adverse water quality impacts to Boston Harbor associated with Airport activities. Massport employs a multitude of programs that promote awareness of Massport and tenant activities, which in turn support improved surface and groundwater quality. Programs include implementing Best Management Practices (BMPs) for pollution prevention and enforcing compliance among Massport departments, tenants, and construction contractors; providing staff and tenant training; maintaining a comprehensive SWPPP; and reviewing project-specific construction SWPPPs for compliance with regulations and Massport policies.

Massport holds individual permits under the U.S. Environmental Protection Agency's (U.S.EPA's) and the Massachusetts Department of Environmental Protection's (MassDEP's) National Pollutant Discharge Elimination System (NPDES) Program as mandated by the **Clean Water Act (CWA)**. The NPDES permits cover Massport and its **co-permittees** at Logan Airport and establish effluent limitations and monitoring requirements for discharges from specified stormwater **outfalls**.

On July 31, 2007, U.S.EPA and MassDEP authorized an Individual NPDES Stormwater Permit for Logan Airport (NPDES Permit MA0000787). The permit became effective on September 29, 2007, and remained in effect with stipulated terms and conditions applicable throughout the 2022 reporting year. Massport also holds a separate Individual NPDES Permit/Massachusetts Surface Water Discharge Permit for the Fire Training Facility located on Governor's Island (NPDES Permit MA0032751), which became effective on April 1, 2021. The following sections describe the requirements of the two permits[1] and Massport's compliance with these requirements.

1 On April 12, 2021, the U.S.EPA issued a draft NPDES permit under the CWA for stormwater and wastewater discharges from Logan Airport, which regulates the discharge of pollutants to state waters, like Boston Harbor. This permit was initially finalized on August 24, 2023, and will update and replace the existing permit issued in 2007 when it becomes effective.

These permits can be reviewed using the following weblinks.

- https://www.epa.gov/npdes-permits/massport-logan-international-airport-npdes-permit#2023FinalPermit
- https://www3.epa.gov/region1/npdes/logan/pdfs/finalma0000787permit.pdf
- https://www3.epa.gov/region1/npdes/permits/2021/finalma0032751permit.pdf

9.1.1 Stormwater Outfall NPDES Permit Requirements and Compliance

The following sections describe stormwater outfalls, the monitoring requirements, and the 2022 monitoring results for Logan Airport areas with coverage under the 2007 NPDES Permit No. MA0000787. Massport also holds a separate surface water discharge permit for the Fire Training Facility, 2021 NPDES Permit No. MA0032751, and compliance status under this permit is discussed in this chapter as well.

9.1.1.1 NPDES Permitted Outfalls

The Logan Airport NPDES Permit No. MA0000787 regulates stormwater discharges from Logan Airport outfalls, including the North, West, Northwest, Porter Street, Maverick Street, and airfield outfalls. These drainage areas are shown in **Figure 9-1** and are further described, including the associated acreages, in **Table 9-2**. The North and West Outfalls have end-of-pipe pollution control facilities to remove debris and floating oil and grease from stormwater prior to discharge into Boston Harbor.

Table 9-2 Stormwater Outfalls Subject to National Pollutant Discharge Elimination System (NPDES) Permit Requirements

Outfall Name and Number	Drainage Area (Acres)	Boston Harbor Discharge Location	Major Land Uses
North (001)	152	Wood Island Bay	Terminal E, apron, taxiway, cargo areas, fuel farms, and runways
West (002)	449	Bird Island Flats	Taxiways, terminal areas, aprons, cargo areas, runways, and roadways
Porter Street (003)	182	Bird Island Flats	Hangars, vehicle maintenance facilities, cargo areas, and car rental facilities
Maverick Street (004)	34	Jeffries Cove	Car rental facilities, bus/limousine pools, and parking areas
Northwest (005)	23	Wood Island Bay	Flight kitchens and bus maintenance facility
Airfield (A1 through A44)[1]	910	Inner Harbor	Runways, taxiways, perimeter roadways, Fire Training Facility, and Massport Fire and Rescue Station 2

Source: Massport.

1 In accordance with the requirements of the NPDES permit, Massport developed an *Airfield Stormwater Outfall Sampling Plan* (March 27, 2008). The plan requires quarterly wet weather sampling at a minimum of seven of the airfield outfalls (A1 through A44) to obtain representative samples of the quality of stormwater runoff from the airfield.

Figure 9-1 Logan Airport Outfalls

2022 Environmental Status and Planning Report

9.1.1.2 Monitoring Requirements

The Logan Airport NPDES permit No. MA0000787 requires **grab samples** to be taken monthly from the North, West, Porter Street, and Maverick Street Outfalls. Samples are tested for pH, oil and grease, total suspended solids (TSS), benzene, surfactants, fecal coliform bacteria, and *Enterococcus* bacteria during both wet and dry weather. Grab samples are also taken quarterly from these four outfalls during wet weather events to analyze for eight distinct polycyclic aromatic hydrocarbons (PAHs), and from the Northwest and Airfield outfalls for pH, oil and grease, TSS, and benzene.

Additional NPDES permit sampling requirements include sampling for deicing compounds twice per deicing season, which is from October through April, at the North, West, Porter Street, and Airfield Outfalls. The NPDES permit sets discharge limitations for pH, oil and grease, and TSS from the North, West, and Maverick Street Outfalls and for pH from the Porter Street Outfall. The NPDES permit No. MA0000787 does not specify discharge limitations for the Northwest Outfall, airfield outfalls, or the deicing monitoring, and only requires the sampling results be reported. The NPDES permit No. MA0000787 also does not set discharge limitations for bacteria, surfactants, benzene, or PAHs for any of these outfalls; sampling results for these parameters require reporting only. Appendix K, *Water Quality Supporting Documentation,* contains additional information on the sampling requirements of both the NPDES permits MA0000787 (Logan Airport) and MA0032751 (Fire Training Facility).

9.1.1.3 Monitoring Results

In 2022, over 97 percent of stormwater samples were in compliance with standards for pH, oil and grease, and TSS. Refer to **Table K-4 to Table K-15** in Appendix K, for more details. Due to the large size of the drainage areas and relatively low concentration of pollutants, it is not always possible to trace exceedances to specific events. Where a known event such as a spill is reported, Massport inspects the drainage system for impacts from the event and undertakes appropriate corrective actions.

Massport electronically submits the prescribed monthly and quarterly data discharge monitoring reports (DMRs) to the U.S.EPA via the U.S.EPA's NetDMR web application. MassDEP accesses Logan Airport's monitoring data submitted through the NetDMR website; however direct submissions of information to MassDEP are made when specifically requested. The 2022 outfall water quality monitoring results are provided in Appendix K along with the history of water quality monitoring results dating back to 1993.

The NPDES water quality monitoring results are also posted on Massport's website: https://www.massport.com/massport/business/capital-improvements/sustainability/water-quality/.

9.1.1.4 Deicing Monitoring

Aircraft and pavement deicing are typically conducted at Logan Airport from October or November through March or April, depending on weather conditions in a given year. Deicer use is subject to the 2007 NPDES permit, which requires Massport and each airline and **fixed base operator (FBO)** conducting deicing at Logan Airport to develop tailored plans for efficient aircraft and pavement deicer application. Massport and its co-permittees conducted a Deicing Management Feasibility Study to evaluate various technologies to reduce glycol-containing aircraft deicing fluid discharges to Boston Harbor. Massport submitted the results of the *Deicing Management Feasibility Study* to the U.S.EPA in May 2017, which included a proposal for implementing a blend-to-temperature program for tracking and reducing the use of glycols.

Massport submitted the results of the *Deicing Management Feasibility Study* to the U.S.EPA in May 2017

Deicing sampling at the North, West, Porter Street, and Airfield outfalls occurred during a wet weather deicing episode on January 7, 2022. Due to weather conditions, only one deicing sampling event occurred during the 2021-2022 deicing season. Stormwater sampling results are reported as required to the via U.S.EPA NetDMR website as noted in Section 9.1.1.3, and deicing monitoring results are also listed in Appendix K, **Table K-14**.[2]

9.1.1.5 Stormwater and Sanitary Sewer System Inspections and Repairs

Massport's Facilities Department conducts biannual inspections of the six Stormceptor® devices located throughout the Airport in accordance with Part I.B.10.h. of the Logan Airport NPDES Permit. In 2022, 10 percent of the units during inspections required cleaning; the remainder of the units had nominal sediment accumulations during these inspection. Removed sediment was transported offsite to a solid waste landfill.

In addition to biannual Stormceptor® inspections, Massport routinely inspected catch basins within100 yards of aircraft, vehicle and equipment maintenance facilities and were cleaned on an as needed basis. The pollution control facilities located at the North and West Outfalls have bar screen rooms, which remove trash and debris from stormwater runoff before release as discharges, as well as oil/water (OW) separators, which remove floating oil and grease. The pollution control facilities are regularly inspected, maintained, and cleaned as appropriate.

9.1.1.6 2022 Bacteria Source Tracking

Massport monitors bacteria levels at stormwater outfalls by obtaining samples during wet weather and dry weather events. The laboratory analytical data obtained for compliance with NPDES Permit No. MA0000787 indicated bacteria levels continue to be highly variable, with no consistent trends that would indicate an on-going source such as a cross-connection to a sanitary sewer line. Sampling results are available in Appendix K. Stormwater monitoring results can also be found on Massport's website: http://www.massport.com/massport/business/capital-improvements/sustainability/water-quality.

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2 Wet weather deicing monitoring is only required during the first and third year of the NPDES permit.

9.1.2 Fire Training Facility NPDES/Surface Water Discharge Permit Requirements and Compliance

The NPDES Permit/MassDEP Surface Water Discharge Permit No. MA0032751 was issued January 21, 2021, and became effective on April 1, 2021. In addition to the NPDES Permit MA0000787, which regulates stormwater discharges from Logan Airport as a whole, this permit specifically regulates treated wastewater discharges to Boston Harbor surface waters from Logan Airport's Fire Training Facility (**Figure 9-1**). These wastewaters result from process water that collects at the Fire Training Facility during firefighting training exercises. There are no storm drains within the Fire Training Facility, so this permit does not regulate stormwater discharges, but rather is specific to the treated process water collected from the fire training area.

9.1.2.1 Fire Training Facility NPDES Monitoring Requirements

All generated wastewater from the Fire Training Facility is processed and treated through OW separation and GAC filtration, regardless of whether the water will be reused onsite or not.

Treated wastewater generated from fire training exercises, which generally occur from April through November, are collected and stored in an above ground holding tank onsite. Wastewater is treated by OW separation and granular activated carbon (GAC) filtration methods to remove fuel contaminants, then reused onsite to recharge the fire training pit for training exercises.

If tank storage capacity is unavailable, the treated wastewater is tested to confirm water quality standards are met prior to discharge from airfield Outfall 001. Because treated wastewater is typically recycled for future training use, discharges are infrequent during the training season. Controlled, batch-type treated wastewater discharges are conducted at the end of the season by a licensed Massachusetts wastewater treatment operator. Prior to the controlled discharges, Massport provides the treated wastewater water quality testing results to the Massachusetts Division of Marine Fisheries (MassDMF) to obtain approval prior to the discharge event in conformance with the permit.

On March 10, 2021, the U.S.EPA issued a minor modification to the NPDES Permit No. MA0032751 to clarify that grab samples should be collected from above ground holding tanks after the water has undergone treatment, but prior to discharge.[3] Previous EDRs reported findings derived using the prior monitoring method, which required composite sampling as well as sample collection during active discharge. The discharge monitoring requirements and analytes applicable to the 2022 reporting year as well as the prior reporting requirements are provided in Appendix K, **Table K-2** (2014) and **Table K-3** (2021).

3 Letter via email "Minor Modification of NPDES Permit No. MA0032751 (for) the Massachusetts Port Authority's Fire Training Facility" (March 10, 2021). https://www3.epa.gov/region1/npdes/permits/2021/finalma0032751permitminormod.pdf

In 2022, DMRs that included wastewater sampling results were submitted electronically to the U.S.EPA on a monthly basis as mandated by the permit via the U.S.EPA's NetDMR web application, regardless of whether discharges occurred.

Aqueous film forming foam (AFFF) containing per- and polyfluoroalkyl substances (PFAS) are used by Aircraft Rescue and Firefighting (ARFF) personnel to fight aviation fuel fires safely and efficiently, per Federal Aviation Administration (FAA) Part 139 Certification safety requirements. In 2022, only AFFF products containing PFAS surfactants were available for purchase that also met FAA Part 139 Certification safety requirements for safely fighting fires involving aviation fuel. However, Massport has eliminated the use of AFFF containing PFAS in fire training exercises, which is also in accordance with FAA guidance. When a PFAS-free AFFF replacement product becomes available, Massport will follow FAA guidance and safety requirements regarding transitioning to the new product and its use.

Table K-2 in Appendix K lists six PFAS compounds required for discharge monitoring once a multi-lab validated laboratory method is approved by the U.S.EPA, and Massport anticipates this reporting requirement will take effect in the 2023 reporting year per the MassDEP permit's terms and conditions. The U.S.EPA had yet to publish a multi-lab validated method by the end of the 2022 reporting year, but U.S.EPA Method 1633 had been single lab validated, so in Fall 2022, Massport collected and analyzed discharge samples for PFAS. Although subsequent discussions with the U.S.EPA clarified this sampling was not yet required, the PFAS analysis results identified only trace amounts of one compound, Perfluorooctanesulfonic Acid (PFOS), at less than 3 parts per trillion (ppt).

9.1.2.2 Fire Training Facility Regulated Discharges in 2022

In 2022, three controlled, batch-type discharges of treated wastewater from the Fire Training Facility to Boston Harbor were conducted after submitting sample analysis results to MassDMF and receiving approval. Massport discharged treated wastewater on three distinct days: November 9, 10, and 21. The total gallons of treated wastewater discharged for each event were 20,279 gallons; 20,100 gallons; and 19,300 gallons, respectively, at a discharge rate of 85 gallons per minute (gpm).

9.2 Fuel Use and Spills in 2022

Management of Massport's Aircraft Fueling System (AFS) consolidated jet fuel storage facility and hydrant distribution system was designed to minimize water quality impacts by implementing SWPPP BMPs. More specifically, integral AFS components include cathodic protection, leak detection devices, secondary containment sufficient to capture and contain spills or leaks, and tank overfill protection methods such as alarms, inventory-gauging sensors in the tanks, and emergency fuel shut-off systems. Built-in environmental controls, unified operations (the AFS facility is leased and operated by BOSFuel Corporation, a consortium of airlines), and on-going contingency planning provide heightened environmental protection and more efficient fuel handling operations. In addition, the AFS reduces at-gate tanker truck fuel deliveries thereby minimizing fuel handling and opportunities for spills to occur.

Massport Fire Rescue maintains records of spills at Logan Airport. State environmental regulations require that fuel spills of 10 gallons or more in volume be reported to MassDEP. Spills that enter storm drains of any volume must also be reported to MassDEP. Massport maintains records of spills, including those less than the reporting threshold. In 2022, of the oil and hazardous material spills reported to Massport Fire Rescue, only three were reportable quantity spills requiring MassDEP notification. The spills did not enter the storm drains. Of the three reportable spills in 2022, two were due to aircraft malfunctions and the other fuel spill was due to a hydrant truck malfunction.

A summary of Logan Airport jet fuel usage and spill records from 1990 to 2022, as well as details pertaining to type and quantity of the spills, can be found in Appendix K **Table K-16** and **Table K-17**.

9.3 Tank Management Program

Massport implements a tank management program that includes:

- A continuing program of routine inspections, testing, and minor repairs of all Massport-owned **underground storage tanks (USTs)**, related piping, tank monitoring systems, and related equipment.
- Annual Stage I Vapor Recovery testing on Logan Airport's gasoline USTs and piping systems. Stage I vapor recovery involves the recovery of vapors from the gasoline tank by the tanker truck during the fuel unloading process.
- Annual Department of Fire Services (DFS) inspections of Massport's **aboveground storage tanks (ASTs)** greater than 10,000 gallons in volume, and submittal of the inspection documentation to DFS. Massport owns three ASTs at Logan Airport with volumes greater than 10,000 gallons. Two of these tanks are located in the North Service Area and contain potassium acetate runway deicing fluid. The third tank is located at the Central Heating Plant and is used for the storage of heating oil.
- Review of all proposed tenant tank upgrades, installations, and tank removals under Massport's **Tenant Alteration Application (TAA)** process[4] to ensure compliance with applicable state and federal regulations and with Massport policy.
- On-going upgrade and maintenance of a database on all USTs located on Massport property. The database tracks location, permit status, and tank and monitoring system equipment summaries. Information on ASTs is kept in a separate database developed in 2010.
- Information provided to tenants regarding the revised storage tank regulatory requirements and assistance with tenants' tank permitting procedures.

4 The Tenant Alteration Application is an internal Massport process for tenants who want to make modifications to their leasehold.

9.4 Site Assessment and Remediation

Massport complies with the MCP, 310 Code of Massachusetts Regulations [CMR] 40 et seq., by monitoring fuel and oil and hazardous materials spills, and tracking the status of spill response actions. The MCP lays out regulations that govern the reporting, assessment, and cleanup of spills of oil and hazardous materials in Massachusetts. The MCP, which is administered by MassDEP, prescribes the site cleanup process based on the nature and extent of a release's contamination. The MCP defines the roles for those parties affected by and potentially responsible for the release and establishes the release reporting program and submission deadlines for tracking events from initial release to regulatory closure.

In accordance with the MCP, Massport assesses, remediates, and brings to regulatory compliance closure areas of subsurface contamination. Active MCP sites are illustrated in **Figure 2-2**, and **Table K-18** in Appendix K describes Massport's progress in 2022 in achieving regulatory closure of MCP sites. Detailed information for sites which achieved regulatory closure can be found in **Table K-19** and **Figure K-1** in Appendix K.

Figure 9-2 Massachusetts Contingency Plan Sites (Active)

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1. Fuel Distribution System (3-1287)
2. Fire Training Facility (3-28199)
3. Former American Airlines - North Cargo (3-35030)
4. Terminal B Gate 5 (Formerly Gate 7) (3-35047)
5. Former Building 6 (3-37749)

0 450 900 1800 Feet

10. Project Mitigation

Massport's **Environmental Status and Planning Report (ESPR)** is a unique document within the **Massachusetts Environmental Policy Act (MEPA)** process that provides an overview of Logan Airport operations and environmental conditions and establishes a context for project review and approvals through the MEPA process. Unlike other MEPA documents, the ESPRs and annual **Environmental Data Reports (EDRs)** are not projects within the typical MEPA framework. The ESPRs and EDRs do not take the place of an individual project filing subject to MEPA, nor do they serve as an approval for any specific activity.

Within the traditional MEPA process, project mitigation refers to specific project measures taken to avoid, minimize, and mitigate environmental impacts associated with specific projects. For Logan Airport ESPRs and EDRs, Massport reports on several types of measures aimed to reduce environmental impacts, which are grouped into the following categories:

- **Project mitigation** refers to mitigation measures as prescribed under Massachusetts General Law Chapter 30, Section 61 **(Section 61 or Section 61 Findings and Mitigation Commitments)** for projects required to prepare a state Environmental Impact Report (EIR). The formal Section 61 measures discussed in this chapter are specific to individual projects and include steps taken to avoid and minimize environmental impacts through design, construction, or ongoing operations.
- **Community mitigation** refers to those measures Massport has agreed to take outside of the MEPA process, and these are presented in greater detail within Chapter 2, *Sustainability, Outreach, and Environmental Justice*.
- **Other environmental measures** are programs and initiatives that Massport voluntarily implements, in addition to Section 61 project mitigation and community mitigation efforts, and these include a wide range of other environmental measures that are not project-specific, but rather are aimed at addressing broader impact categories. These include noise abatement measures, ground transportation accessibility improvements, high-occupancy vehicle (HOV) strategies, Massport's *Roadmap to Net Zero by 2031* (*Net Zero by 2031*) initiative, and many other operational measures that

increase Airport efficiency, improve the quality of services provided, and reduce community impacts. These other environmental measures are discussed in Chapter 2, and in applicable subject matter chapters that address topics like ground access, air quality, and noise, among others.

The status of Logan Airport projects with active Section 61 commitments is presented in this chapter. The COVID-19 pandemic significantly reduced Airport activity levels and revenue; prompting Massport, airlines, and tenants to make operational adjustments. However, projects and programs, which were deferred due to reduced passenger activity levels caused by the pandemic, have begun to resume. Massport continues to comply with its project mitigation commitments as outlined in the projects' Secretary's Certificates, which are presented in Appendix A, *MEPA Certificates and Responses to Comments*.

10.1 Projects with Section 61 Commitments

The following projects have ongoing Section 61 mitigation measures, and the current mitigation implementation status for each project as of this publication is summarized in this chapter. Massport continues to track its mitigation commitments, and the forum for reporting on their status is the ESPR and EDR documents. The applicable projects are listed below in the chronological order of their completion:

- **West Garage Project, Executive Office of Energy and Environmental Affairs (EEA)** #9790: Phase I and Phase II construction was completed in 2007.
- **International Gateway Project**, EEA #9791: Phase I was completed in 2004; Phase II was completed in 2007; and the final phase has been changed to the Terminal E Modernization Project (EEA #15434).
- **Replacement Terminal A Project**, EEA #12096: Terminal A opened March 16, 2005.
- **Logan Airside Improvements Planning Project**, EEA #10458: Runway 14-32 opened on November 23, 2006. The Centerfield Taxiway was completed and became fully operational in 2009.
- **Southwest Service Area (SWSA) Redevelopment Program**, EEA #14137: The Rental Car Center (RCC) construction program began in summer 2010, and the first phase of the facility opened in fall 2013. The other project phases were completed in 2014.
- **Logan Airport Runway Safety Areas (RSA) Project**, EEA #14442: Runway 33L RSA construction began in June 2011 and was completed in November 2012. The Runway 33L approach light pier replacement was completed concurrently with Runway 33L RSA construction. Runway 22R Inclined Safety Area (ISA) construction was completed in 2014.
- **Terminal E Modernization Project**, EEA #15434: Phase I of the project was completed in October 2023, and accommodates existing and long-range forecasted passenger demand for international service. Phase I included the construction of 390,000 square feet of terminal space; renovations to the existing Terminal E structure to create a unified building; and adding new four gates permitted and approved as part of the International Gateway West Concourse Project in 1996, but this portion of the project was not constructed. Phase II will involve construction of three additional new aircraft contact gates. See Chapter 4, *Airport Planning*, Section 4.2, for additional information.

- **Logan Airport Parking Project,** EEA #15665: The project involves the phased addition of commercial parking at Logan Airport consistent with the amendment to the Logan Parking Freeze. In 2018, Massachusetts Department of Environmental Protection (MassDEP) and the U.S. Environmental Protection Agency (U.S.EPA) approved an amendment to the **Logan Airport Parking Freeze** to add an additional 5,000 spaces at Logan Airport. Massport filed an EIR, and MEPA issued a Certificate (January 2020) approving new parking in two Airport campus locations; a new garage across from Terminal E (2,000 spaces), and additional floors within the Economy Garage (3,000 spaces). Massport prepared an **Environmental Assessment (EA)** on the project and the Federal Aviation Administration (FAA) issued a **Finding of No Significant Impact (FONSI)**, allowing the project to move forward.

  Construction of the MEPA EEA and FAA joint-approved **Terminal E Garage** in front of the terminal was deferred during the COVID-19 pandemic, but as passenger demand has rebounded, the demand for commercial parking has returned. In late 2023, Massport moved into the preliminary design process for the garage, taking current conditions into account, and has reconfirmed the need for additional parking spaces to encourage long-term parking at the Airport rather than drop-off and pick-up trips.

  Massport has now restarted this deferred project, and the updated program for the project now calls for approximately 4,300 commercial revenue spaces, which would be built in a new garage in front of Terminal E. No parking spaces are being proposed for the Economy Garage at this time. Located in the central terminal area of the Airport, the new garage will also improve connectivity to the existing parking complex and on-Airport roadways.
- **Runway 27 End Runway Safety Area Improvements Project,** EEA #16433: This project will enhance safety for aircraft and passengers in emergency situations by improving the Runway 27 End RSA. The RSA improvements are a required FAA safety project. The project would not extend the runway or affect normal runway operations, capacity, or types of aircraft using the runway. An EA and **Final EIR (FEIR)** were completed in 2023. and Massport issued a Request for Letters of Interest and Requests for Qualifications (RFQs) in late 2023, and a Request for Proposals (RFP) will be issued for a design-build entity in the near future. Project environmental permitting is currently underway as of this filing.

Once projects with ongoing requirements are constructed, mitigation tracking reports on the continuing requirements. Each project discussed below has completed its requisite state and federal environmental reviews and has adopted mitigation plans that have been formalized with individual Section 61 Findings.

Massport tracks both Massport and Logan Airport tenants’ progress towards implementing and meeting their environmental mitigation commitments on schedule and in accordance with the requirements outlined in the Section 61 Findings for each project. As each project moves forward through its design and construction phases, its mitigation plan is implemented with ongoing tracking to verify compliance. Once mitigation efforts are completed, those projects are no longer reported in EDRs and ESPRs.

The following sections describe each project's current implementation status for measures that occurred in the reporting period. Previous filings contain historical details on the implementation of mitigation measures. The **Environmental Notification Forms (ENFs)**, **Draft EIRs (DEIR)**, and FEIRs issued for the projects discussed in this chapter are provided in Appendix A, which contains the Secretary's Certificates.

10.2 West Garage Project – EEA #9790

The West Garage is directly connected to the Central Garage, thereby centralizing the two structures parking into a larger, unified, and easily accessible garage. The West Garage Project (**Figure 10-1**) was constructed in two phases. Phase I of the Project provided 3,150 parking spaces consolidated from other areas of Logan Airport. The West Garage Project also included construction of elevated walkways connecting the West Garage to Terminals A and E as well as improvements to the terminal roadways.

10.2.1 Permitting History

- Certificate on the FEIR issued on March 16, 1995.
- Section 61 Findings approved on March 27, 1995.

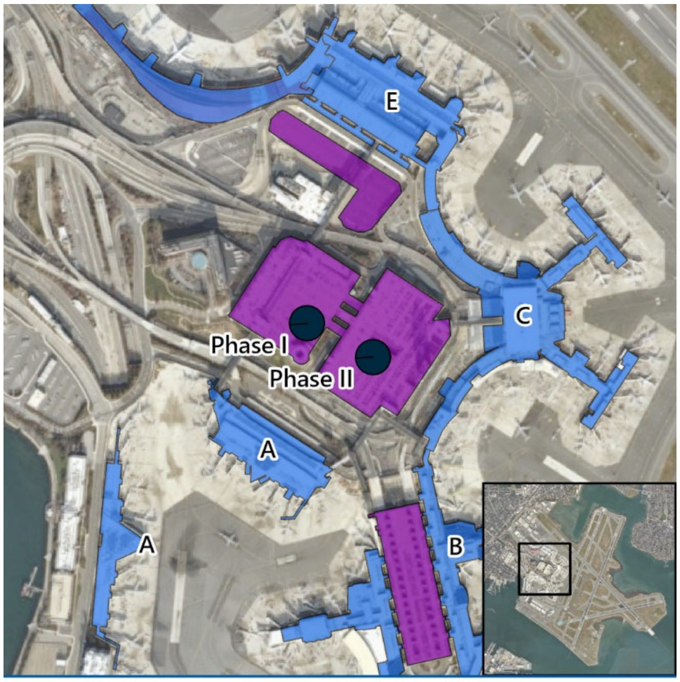

Figure 10-1 West Garage Project EEA #9790

Terminal Buildings
Project Location
Parking Facilities

Notes: See Table 10-1 for a description of project.
Status as of 12/2022.
Source: Nearmap (November 2022)

0 270 540 Feet

10.2.2 Project Status

The original design of Phase II of the West Garage included the construction of a new parking facility structure adjacent to the West Garage. Instead, Massport concluded it was more cost-efficient to proceed with Phase II by adding three additional levels, Levels 5, 6, and 7, to the existing Central Garage. Phase II of the West Garage Project provided approximately 2,800 additional parking spaces.

- **Phase I** – Construction commenced in October 1995 and the garage opened on September 8, 1998. The elevated walkways to the Terminals were completed in 2002. Improvements to Terminal roadways were completed in 2003.
- **Phase II** – Permitting was completed in 2000 to add three levels to the Central Garage. Construction commenced in 2004 and the entire facility enhancement was completed in 2007.

Table 10-1 and **Table 10-2** list the Section 61 mitigation measures from the West Garage Project FEIR, dated January 31, 1995, and those measures referenced in the Massport Board's vote on the West Garage Project. **Table 10-1** lists each of the continuing Section 61 mitigation commitments for the West Garage Project and Massport's 2022 progress in achieving these measures. **Table 10-2** details the elements and status of the **Alternate Fuel Vehicle (AFV)** Program, which was a key mitigation effort associated with the West Garage Project. While many of the mitigation measures have been previously implemented, this ESPR reports on the mitigation implementation status as of the end of 2022.

Unrelated to this project, in late 2015, Massport completed the West Garage Parking Consolidation Project, which consolidated 2,050 temporary parking spaces within an addition to the West Garage as well as within the existing surface lot between the Logan Office Center and the Harborside Hyatt™. The West Garage addition was located on the site of the existing Hilton™ Hotel parking lot. Construction of these spaces constituted the remainder of the spaces permitted under the Logan Airport Parking Freeze as of that date.[1] On March 20, 2014, the EEA issued an **Advisory Opinion** confirming no **MEPA review** was required for this project. Construction commenced in the spring of 2015 and was completed in 2016.

Table 10-1 West Garage Project Status Report (EEA #9790) Details of On-going Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Parking Pricing	
Parking pricing initiatives: keeping first-hour prices high enough to provide a disincentive for drop-off/pick-up.	**Implemented.** Parking rates were last changed in 2023 as described in Chapter 6, *Ground Access*, Section 6.5.4
Parking pricing initiatives: keeping the weekly price low enough to encourage vacation travelers to park for a week.	**Implemented.** In 2021, Massport began offering parking reservations, making it easier for passengers to organize and guarantee long-term parking. See Chapter 6, Section 6.4.5.3 for more details on parking reservations and Section 6.5.7 for the Long-Term Parking Management Plan.
Massport will consider means to encourage the use of limited amount of on-Airport commercial parking for long-term. Massport will promote environmentally positive modes of airport access by air passengers.	**Implemented.** Massport actively manages a Long-Term Parking Management Plan to help encourage long-term parking by passengers. The Long-Term Parking Management Plan includes initiatives to evaluate parking supply, pricing, and demand. Refer to Chapter 6, Section 6.5.7 for further details.
Once sufficient data is collected, Massport will evaluate parking behavior attributable to modified price rates and then consider further pricing adjustments to assist in achieving Massport's ground transportation goals.	**Implemented.** Massport continuously collects data on parking conditions and behaviors, and then uses findings to assess pricing options and the efficacy of other initiatives. Data on parking conditions in 2022 is presented in Chapter 6, Section 6.4.

1 310 Code of Massachusetts Regulations 7.30 and 40 Code of Federal Regulations 52.1120.

Table 10-1 West Garage Project Status Report (EEA #9790) Details of On-going Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
The Executive Director shall report to Massport annually regarding the effectiveness of the parking pricing policy and recommend appropriate policy adjustments as a part of the process of achieving Massport's ground access goals initiatives.	**Implemented.** Massport maintains a Long-Term Parking Management Plan devised to promote long-term parking among passengers. This plan encompasses evaluating potential initiatives in terms of parking supply, pricing, and demand as detailed in Chapter 6, Section 6.5.7. Additionally, Massport gathers data surrounding parking conditions and behaviors, using the results to assess pricing strategies and the utility of various initiatives. For comprehensive data on the parking conditions as of 2022, refer to Chapter 6, Section 6.4.
Concurrent Ground Access Improvement Mitigation Measures	
Employee Trip Reduction Measures	
Massport will form a Transportation Management Association (Logan TMA) for Logan Airport employees in order to provide new opportunities for the development of targeted transportation demand management (TDM) strategies for Massport and airport tenant employees.	**Implemented.** Massport continues to support the TDM strategies by funding the Logan Sunrise Shuttle at a cost in 2022 of approximately $161,000. Massport continues to conduct outreach through new hire orientation materials and other communication methods to raise awareness of employee commute options with a focus on high-occupancy vehicle (HOV) modes of transportation.
Massport will develop, coordinate, and implement effective TDM strategies to reduce the number of single-occupant trips made by all Logan Airport employees, including outreach to employees about transportation options.	**Implemented.** Massport supports TDM strategies by providing services to Logan Airport employees and by periodically conducting the Massport Employee Survey. Findings from the *2022 Logan International Airport Air Passenger Ground Access Survey* are summarized in Chapter 6, Section 6.5.2. Massport surveys its employees as part of its Massachusetts Department of Environmental Protection (MassDEP) Rideshare reporting requirements.
Massport will encourage participation by all Massport and tenant employees, but will particularly target the Airport's largest tenant employers.	**Implemented.** Massport aims to decrease the number of Airport employees commuting by car to Logan Airport, improve commuting options, and alleviate traffic, and lessen parking demands. Massport continues to run free shuttle services to various parts of the Airport, operate the Sunrise Shuttle for early morning commuters, and provide pedestrian and bicycling facilities. Massport also contributes financing annually to support these initiatives. Additional information can be found in Chapter 6, Section 6.5.8.
Massport will report on the formation and activities of the Logan TMA in the next Generic Environmental Impact Report (GEIR). [Now ESPR]	**Implemented.** Massport continues to support TDM strategies by funding the Logan Sunrise Shuttle at a cost in 2022 of approximately $161,000. Massport conducts outreach through new hire orientation materials and other communication and engagement methods to raise awareness of employee commute options with a focus on HOV modes of transportation.

Table 10-1 West Garage Project Status Report (EEA #9790) Details of On-going Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Massport proposes to implement a new Logan Express service, or other HOV services, depending on the needs of the targeted market before Phase II of the West Garage Project is operational.	**Implemented**. As passenger activity rebounds after COVID-19, Massport is resuming services and restarting certain deferred projects based on passenger needs and overall demand. These include restoring bus services, resuming parking expansion projects and construction, opening a new, suburban Logan Express location, focusing on improvements to employee parking, and enhancing similar types of service offerings. Ridership and service information on Massport's Logan Express Program is provided in Chapter 6, Section 6.3.1.2.
Provide an airport shuttle service from South Station Transportation Center. Massport is preparing a feasibility and business plan for a South Station-Logan Airport shuttle service and will implement this service when the Third Harbor Tunnel is opened for commercial traffic. This service will be modeled on the existing, successful Logan Express services and will include frequent bus service between South Station and the airport terminals. Massport will regularly evaluate the frequency of, and demand for, such shuttle service and will provide such service at the greatest frequency that is practical and effective.	**Implemented.** Massport continues regular collaboration with the Massachusetts Bay Transportation Authority (MBTA) on the Silver Line Airport service and makes adjustments, as necessary. Beginning in May 2012, Massport initiated a pilot program offering free rides on the Silver Line from Logan Airport to downtown Boston to promote HOV usage and heighten awareness of public transit options. The purpose of the program was to encourage ridership by improving operations and customer service. Free service from Logan Airport continues as of the filing of this *2022 ESPR*. Additionally, Massport has purchased ten new MBTA Silver Line buses as part of the MBTA procurement process. In 2022, as passenger demand increased after the pandemic, Massport collaborated with the MBTA to allow for service headways to match passenger needs.
Massport will implement a new water shuttle service in Boston Harbor before the opening of Phase I of the West Garage Project. The water shuttle would run between Logan Airport and one, or possibly more, sites in the Harbor.	**Implemented.** Massport continues to support Boston water taxi service operations. Refer to Chapter 6, Section 6.3.1, for water shuttle ridership information.
The Executive Director shall make recommendations to Massport for budgetary appropriations to establish and implement the new ground access services on a schedule that permits Massport to implement the new ground access services within these time frames.	**Implemented.** Massport's Executive Director or Chief Executive Officer (CEO) recommends budgetary appropriations for ground access services on an annual basis.

Table 10-1 West Garage Project Status Report (EEA #9790) Details of On-going Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Enhancement of Existing HOV Services: Logan Express	
Expand Logan Express hours of service.	**Implemented**. As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, and projects are prioritized based on passenger needs and user demand. Updates on projects deferred due to COVID-19 are discussed in Chapter 4, *Airport Planning*, Section 4.1, but can be summarized as follows: • Suspended Logan Express service from Peabody, Woburn, and Back Bay: Services restored in 2022. • Logan Express headways reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and the new Quincy lot is helping to increase passenger capacity at Braintree as well as a parking expansion at Framingham, which is also helping to improve passenger use. • Postponed construction of additional parking at Framingham Logan Express: Project has resumed and is in the design phase with construction currently estimated to begin in 2024. • New Logan Express suburban location: Peabody Logan Express at the new North Shore location opened in 2022. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing the Back Bay Logan Express. Schedules are available at http://www.massport.com/logan-airport/to-from-logan/transportation-options/logan-express/.
Provide a guaranteed ride home for Logan Express users.	**Implemented and subsequently modified.** Extended service now provides nearly 24-hour service at several Logan Express locations.
Provide Logan Express price incentives.	**Implemented.** Massport continues to monitor price incentives and implements additional incentives to promote Logan Express ridership, particularly during popular vacation timeframes, holidays, and other periods of peak Airport activity. Updates on incentives for Logan Express Passengers are included in Chapter 6, Section 6.5.7.

Table 10-1 West Garage Project Status Report (EEA #9790) Details of On-going Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Develop an additional Logan Express service.	**Implemented.** Massport opened a fourth Logan Express location in Peabody, Massachusetts in September 2001, several years before the Section 61 commitment date associated with the opening of Phase II of the West Garage Project. The original Back Bay Logan Express service was relocated from Copley Square to Back Bay Station in May 2019, which coincided with promotions like discounted one-way fares and free service from Logan Airport. Security line priority status is also provided to Logan Express Back Bay riders. Massport's plan to operate a new urban Logan Express location between North Station and Logan Airport is currently on hold, although Massport procured buses for this service in 2020. Similarly, planning for potential additional locations in Metro West and on the North Shore is also on hold. Massport is currently moving ahead with final design for an expansion of the Framingham Logan Express Garage (EEA #16168). Peabody Logan Express at the new North Shore location opened in 2022. Danvers Logan Express is expected to open towards the end of 2024.
Enhancement of Existing HOV Services: Water Transportation	
In conjunction with the MBTA, Massport will pursue joint ticketing opportunities for the Hingham Commuter Boat and the Logan Airport Water Shuttle.	**Implemented.** Service is provided from Hingham and Hull directly to Logan Airport via Long Wharf.
Enhancement of Existing HOV Services: Water Transportation	
Massport is reviewing the fee schedules and operating requirements of the dock to make it more accessible and convenient to potential water taxi operators.	**Implemented.** Massport continues to provide free on-Airport shuttle service to the water shuttle dock, serving the Terminals and other locations on the Airport campus.
Initiate a new Boston Harbor Water shuttle service.	**Implemented.** Harbor Express service between Logan Airport and the South Shore, began in November 1996, well before the opening of Phase I of the West Garage in September 1998. In 2001, the MBTA took over operations of this service.

Table 10-1 West Garage Project Status Report (EEA #9790) Details of On-going Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Other Measures	
Coordinate with public and private entities to provide more extensive radio, television, and telephone announcements of poor traffic conditions with suggestions for alternative access modes.	**Implemented.** Massport regularly contacts the media to inform the public about roadway changes, parking shortages, and encourages travelers to use HOV services. Information is disseminated through the Logan Airport email subscriber list, the Massport website, the Fly Logan App, Facebook™, and other social media platforms.
HOV Marketing and advertising. Massport will continue the advertising and marketing programs for HOV services with an emphasis on promoting MBTA, Logan Express and water shuttle services to and from the Airport.	**Implemented.** Massport continues to market Logan Express services via Massport's website and other social media platforms. Information on Logan Express can be found on Massport's website from the following link: https://www.massport.com/logan-airport/getting-to-logan/logan-express.
Prepare an inventory of private scheduled services including origins/destinations, schedule, and cost.	**Implemented.** Massport continues to update and track information about hundreds of privately operated passenger services certified to operate at Logan Airport. Industry changes with such operations make publication of reliable service and schedule information impractical.
Proceed with environmental review and seek funding for construction of the People Mover System.	**Implemented.** Environmental review of the Automated People Mover (APM) was completed as part of the Terminal E Modernization program Environmental Impact Report (EIR).[2] Several options were identified to reduce on-Airport congestion and improve on-Airport ground access efficiency. Initial options included dedicated HOV bus lanes, the creation of an intermodal transportation center with bus service to the Terminals, the construction of an APM, or some combination of these improvements. See Chapter 4, Section 4.1 for more information. These and other options are currently postponed, but will be revisited once passenger levels recover closer to 2019 levels.
Alternative Fuels Program. Massport is carrying out an extensive program to convert existing Massport-owned service vehicles to environmentally preferable sources.	**Implemented. Table 10-2** details Massport's progress in achieving these measures. The current focus is on a transition to non-emitting electric vehicles (EVs) where suitable replacements are available.
Massport will assess progress towards the achievement of HOV goals using on-Airport Automated Traffic Monitoring Systems (ATMS).	**Implemented.** An upgraded Automated Traffic Monitoring System (ATMS) is functioning as planned and designed.

2 The APM concept has since been revised and is now conceived as a direct pedestrian connection to the Airport Blue Line Station as part of Phase II of the planned Terminal E Modernization Project.

Table 10-1 West Garage Project Status Report (EEA #9790) Details of On-going Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Massport will assess progress towards the achievement of HOV goals by monitoring parked vehicles using systems such as the parking and revenue control (PARC) system.	**Implemented.** Massport monitors all parking activity at Logan Airport and inventories all commercial parking facilities on a daily basis. PARC systems are at all on-Airport parking locations.
Measuring, Monitoring, and Evaluating Ground Access Improvements	
Monitor HOV Services (Logan Express, MBTA, water shuttle, limousine/bus, and taxi).	**Implemented.** Ridership information is monitored on an ongoing basis and is reported in Chapter 6, Section 6.3.1.
Monitor HOV Services (Logan Express, MBTA, water shuttle, limousine/bus, and taxi).	**Implemented**. Massport's Ground Transportation Operations Center (GTOC) located in the Rental Car Center (RCC) is the 24/7 command center for all transportation information in and around Logan Airport. GTOC staff monitor up to the minute traffic information to ensure Logan Airport bus services are running efficiently.
Monitor passenger activity and employee modes of transportation.	**Implemented.** Results of this air passenger survey are provided Chapter 6, Section 6.5.2.
Massport supports the use of Automated Vehicle Identification (AVI) to monitor, manage, and facilitate efficient traffic operations at Logan Airport and elsewhere on the regional transportation system.	**Implemented.** An AVI system for Massport's Logan Airport shuttles and Logan Express buses was implemented.
Track the effectiveness of ground access measures.	**Implemented.** Massport continues to track the effectiveness of its ground access mitigation programs in its annual Massachusetts Environmental Policy Act (MEPA) filings.

Source: Massport.
Note: Text in *italics* detailing the mitigation measures is from Section IV, Mitigation of the West Garage Final EIR,

Table 10-2 Alternative Fuel Program — Details of On-going Section 61 Mitigation Measures for the West Garage Project (as of December 31, 2022)

Program Element	Projected Date of Completion/ Acquisition	Status
Purchase four electric passenger utility vehicles.	Winter 1995	Implemented.
Purchase five electric sedans.	Winter and Summer 1995	Implemented.
Build compressed natural gas (CNG) quick-fill station.	Spring 1995	Implemented. In 2022, the station dispensed approximately 169,000-gallon equivalents of CNG from the station located in the North Service Area.
Purchase five electric buses.	Spring and Summer 1995	Implemented. As of December 2022, 478 electric ground service equipment (eGSE) vehicles were in service and operated by Massport and Logan Airport tenants. Massport purchased 10 Silver Line buses, which are operated by the MBTA with Massport paying for the operating costs for these buses. Massport will purchase 10, new Silver Line buses as part of a forthcoming (Spring 2023) MBTA procurement. In 2017, Massport funded mid-life rebuilds of four Silver Line buses, then rebuilt four additional buses in 2018. A mid-life rebuild extends the useful life of each vehicle by approximately eight years. Massport is collaborating with the Massachusetts Clean Energy Center (MassCEC) to study opportunities for conversion of the ride-for-hire fleet that serves Logan Airport to EVs. The ride-for-hire fleet includes shared ride, rental car, taxi, and limousine vehicles. In early 2022, MassCEC provided a grant to initiate this work as well as some additional funding to increase Logan Airport's EV charging infrastructure.
Install quick-charge kiosks for electric vehicles.	Summer 1995	Implemented. At Logan Airport, Massport provides more than 100 landside EV charging ports with dedicated parking spaces. Of these ports, 46 are conveniently located near the Terminals in the adjacent parking garages, and 10 additional ports are located in the Economy Garage, which has free shuttle access to the Terminals.
Develop slow-charge infrastructure.	Ongoing	Implemented. The original electric charging infrastructure included 15 inductive charging locations. Currently, there are no vehicles using inductive charging, so these are not used. However, Massport has prioritized the addition of EV charging ports throughout the taxi pool, cell phone, and Logan Express lots.

Source: Massport.

10.3 International Gateway Project (Terminal E) – EEA #9791

The International Gateway Project (**Figure 10-2**) expanded and upgraded Terminal E to provide better service to international passengers. The original Terminal E was opened in 1974 and over time became outdated and too small to accommodate the current international operations.

Figure 10-2 International Gateway Project EEA #9791

Terminal Buildings
Project Location
Parking Facilities

Notes: See Table 10-2 for a description of project.
Status as of 12/2022.
Source: Nearmap (November 2022)

0 310 620 Feet

10.3.1 Permitting History

- Certificate on the FEIR issued on December 2, 1996.
- Section 61 Findings submitted to EEA on June 26, 1997.

10.3.2 Project Status

This project is being constructed in phases:

- **Phase I – Complete.** This phase included a weather-protected, outside airside bus portico with an elevator and escalator linking the ground floor to the second floor to accommodate passengers arriving on remotely parked aircraft which are unable to park at an aircraft gate because it is occupied by another aircraft.
- **Phase II – Complete.** This phase enlarged Logan Airport's congested Federal Inspection Services (FIS) Facility and improved the greeter lobby and the Terminal E ticketing area to maximize passenger convenience and reduce processing times at the terminal. To reduce curb and roadway congestion at Terminal E, this project included a new separated roadway system for arrivals and departures.
- **Future Phase – Transitioned to Terminal E Modernization Project (EEA #15434)**. The West Concourse element of the International Gateway Project and its three additional gates were approved but not constructed. These three gates are now included as Phase I of the ongoing Terminal E Modernization Project which opened in the fall of 2023 (see below).

Construction of Phases I and II of this project commenced in the summer of 1998. Phase I was completed in 2004. The departure level of the terminal, including the new ticketing hall and departure level roadway, opened in May 2003. Phase II enlargement of the FIS Facility and construction of the new arrivals level was completed in July 2007. Preliminary work was completed for the West Concourse including planning for three additional contact gates that were not constructed. In 2017, Massport reconfigured three existing gates to be compatible with wide-body, double-deck aircraft such as the Airbus-380. Additional information on Terminal area planning is available in Chapter 4, Section 4.2.

As part of a separate project, Massport received approval for the modernization of Terminal E to accommodate existing and forecasted passenger demand for long-range international. An ENF was filed in October 2015. The DEIR/EA was filed in July 2016, and the FEIR/EA was filed in September 2016. The FAA issued a FONSI on November 10, 2016, and a **Record of Decision (ROD)** on November 14, 2016 for the project (see Chapter 4, Section 4.2 for additional information). Phase 1 of the project (four new gates) opened in the fall of 2023. Mitigation commitments associated with the Terminal E Modernization Project (EEA #15434) are discussed later in this chapter.

Table 10-3 lists each of the continuing mitigation measures for the International Gateway Project in the Section 61 Findings, along with Massport's progress in achieving these measures through the end of September 2022. Many of the mitigation measures for this project have long since been implemented, but recent updates have been noted in the tables. Completed design and construction phase measures are described in previous ESPRs and EDRs.

Table 10-3 International Gateway Project Status Report (EEA #9791) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Alternative Fuel Outreach Program	
Massport is working cooperatively with the U.S. Environmental Protection Agency (EPA) and regional utility providers in coordinating an ongoing outreach program aimed at promoting the use of clean-burning alternative fuels. This program, which is also supported by fuel providers, vendors, and state and federal agencies, will offer information to airport tenants in the following areas: • *Notification of grant programs or other financial incentives for vehicle conversions.* • *Assistance in cost-benefit analysis for conversion of conventionally fueled vehicles to Alternative Fuel Vehicles (AFVs).* • *Assistance in placing airport tenants in contact with alternative fuel suppliers and product vendors.*	Implemented. Massport continues to work with the U.S.EPA, regional utility providers, and other stakeholders in evolving Logan Airport's fleets to alternative power sources, in line with available technologies. The AFV Program is designed to replace Massport's conventionally fueled fleet with alternatively fueled or powered vehicles, when feasible, to help reduce emissions associated with Logan Airport operations. Massport now operates more than 100 vehicles powered by CNG, propane, E85 flex fuel, diesel-electric hybrid, gasoline-electric hybrid, and plug-in electric. Massport also established a vehicle procurement policy in 2006 that requires consideration of AFVs when purchases are made. Massport is also collaborating with the FAA, airlines, and suppliers to develop strategies to bring sustainable aviation fuel (SAF) to the Northeast.

Table 10-3 International Gateway Project Status Report (EEA #9791) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
High-Occupancy Vehicle (HOV) Promotion	
Massport will reserve terminal space for ground transportation ticket sales, reservations, and information.	Implemented.
Attractive and distinctive signage and graphics will be utilized inside the terminal and out at the curb to clearly mark access to Logan Express, MBTA, water transportation, and other HOV options.	Implemented.
As HOV services continue to develop and expand at Terminal E, Massport will expand its web page to encompass these new services and initiatives.	Implemented.
Massport and the MBTA will offer, on a trial basis, the sale of MBTA tokens via a vending machine in the baggage claim area of Terminal C.	Implemented.

Source: Massport.
Note: Text in *italics* detailing the mitigation measures is excerpted from the Section 61 Findings submitted to EEA, June 26, 1997.

10.4 Replacement Terminal A Project – EEA #12096

The Replacement Terminal A Project (**Figure 10-3**) replaced the original Terminal A with a main terminal linked to a satellite concourse. The new Terminal A opened on March 16, 2005.

10.4.1 Permitting History

- Certificate on the FEIR issued on November 16, 2000.
- Section 61 Findings submitted to EEA on August 31, 2001.

10.4.2 Project Status

In the spring of 2006, Delta Air Lines and Massport submitted an application for certification of Terminal A under the U.S. Green Building Council's (U.S. GBC) **Leadership in Energy and Environmental Design (LEED®)** Green Building Rating System™. LEED certification was awarded in June 2006, making Terminal A the first airport terminal in the world to be awarded LEED® certification.

Figure 10-3 Replacement Terminal A Project EEA #12096

Terminal Buildings
Project Location
Parking Facilities

Notes: See Table 10-3 for a description of project. Status as of 12/2022.

Source: Nearmap (November 2022)

The following sustainable elements were incorporated into Terminal A:

- **Water conservation** – low-flow toilets and drip, rather than spray, irrigation
- **Atmosphere protection** – zero use of chlorofluorocarbon-based, hydro chlorofluorocarbon-based, or halon refrigerants
- **Energy conservation** – special roofing and paving materials that reflect solar radiation. Solar panels were installed on the roof of Terminal A in 2012
- **Materials and resources conservation** – more than 10 percent of all the building materials used to construct the terminal were from recycled materials
- **Enhanced indoor environmental air quality** – low and volatile organic compound (VOC) free adhesives, sealants, paints, and carpets
- **Sustainable sites** – bicycle racks

Table 10-4 lists each mitigation measure in the Section 61 Findings along with Massport's progress in achieving these measures through the end of September 2023.

Table 10-4 Replacement Terminal A Project Status Report (EEA #12096) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Project Design Mitigation	
Logan Transportation Management Association (TMA) Participation	
Delta Air Lines, Inc. to join Massport's Logan TMA and designate an Employee Transportation Advisor.	Implemented.
Additionally, Delta Air Lines will provide the following services as part of their Transportation Demand Management Program (DMP) through the Logan TMA Transportation subsidy for full-time Delta Air Lines employees at Logan Airport; ride matching/carpooling; vanpooling; guaranteed ride home; preferential parking for high-occupancy vehicles (HOVs); shuttle to and from employee parking.	Implemented.
Recycling Program	
The Replacement Terminal A will be included in Massport's terminal recycling program.	Implemented.
High-Occupancy Vehicle (HOV) Promotion	
HOV access can be accommodated on the departures level and will be designated near main entrances to the terminal building to ensure efficient and convenient unloading by air passengers who use these mode-types to access the Airport. *The inner-most curb of [the arrivals level] will be designated exclusively for HOVs and taxis, similar to the departures level.*	Implemented.
Ground Service Equipment (GSE) Conversion	
In conjunction with the Project, Delta Air Lines will implement a program for conversion of its entire GSE fleet at Terminal A as soon as viable alternative fueled fleet vehicles become available and can be effectively integrated into Delta Air Lines' operations at Terminal A. Delta Air Lines will introduce battery powered baggage tugs and belt loaders with the replacement terminal and convert this portion of the GSE fleet by the end of 2008. This represents over 40 percent of Delta Air Lines' current GSE fleet.	Implemented. Massport is facilitating the replacement of gas- and diesel-powered GSE with electric equivalents, by the end of 2027, as commercially available.
Delta Air Lines will also examine the feasibility of locating a Compressed Natural Gas (CNG) fill station at Terminal A. The availability of a CNG fueling station would facilitate conventionally fueled vehicles to be replaced with CNG-fueled vehicles where this vehicle option is offered. Delta Air Lines will introduce these vehicles into its GSE fleet as soon as they become available and are determined to be feasible and practicable for use at Terminal A.	Implemented. Massport is facilitating the replacement of gas- and diesel-powered GSE with electric equivalents by the end of 2027, as commercially available. Massport is advancing plans to extend the infrastructure for plug-in GSE to other locations.

Table 10-4 Replacement Terminal A Project Status Report (EEA #12096) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Where new alternative fuel vehicles (AFVs) are developed and determined to be cost effective and in available supplies, Delta Air Lines will integrate their use into its Terminal A GSE fleet operations.	Implemented. As described earlier, Delta Air Lines has electric baggage tugs and belt loaders and will continue to determine the feasibility of integrating other electric GSE, as available.
Finally, Delta Air Lines will provide Massport with an annual status report/update on the GSE conversion program at Terminal A, for inclusion in Massport's annual Environmental Data Report (EDR).	Implemented. Terminal A includes 32 electric charging stations for Delta Air Lines' electric ramp vehicles. As part of an Airport-wide initiative, Massport is facilitating the replacement of gas- and diesel-powered GSE with electric equivalents by the end of 2027, as commercially available.
Operational Mitigation Measures	
Minimizing nighttime movement of aircraft to and from hardstand positions.	Implemented.
Using single engine taxiing and pushback to the extent feasible and practicable, recognizing that such use is always at the discretion of the pilot in charge of the aircraft based upon his or her experience and safety and operational considerations.	Implemented.
Testing alternative de-icing methods to reduce the amount of glycol usage.	Ongoing.

Source: Massport.
Note: Text in *italics* detailing the mitigation measures is excerpted from the Section 61 Findings submitted to EEA, August 31, 2001.

10.5 Logan Airside Improvements Planning Project – EEA #10458

The Logan Airside Improvements Planning Project (**Figure 10-4**) involved the construction of a new unidirectional Runway 14-32 and centerfield taxiway, extension of Taxiway D, realignment of Taxiway N, improvements to the southwest corner taxiway system, and reduction in approach minimums on Runways 22L, 27, 15R, and 33L.

10.5.1 Permitting History

- Certificate on the FEIR issued on June 15, 2001.
- Section 61 Findings on the FEIR dated June 8, 2001.

In June 2002, FAA filed a Final **Environmental Impact Statement (Final EIS)** and issued the federal ROD in August 2002 approving a unidirectional runway and other improvements, but deferred a decision on the centerfield taxiway pending additional review by FAA.

In November 2003, the Superior Court of the Commonwealth modified a 1976 injunction prohibiting construction of a new runway at Logan Airport, pending further environmental review. The injunction modification allowed construction of the runway in accordance with the Secretary of the EEA's Certificate on the FEIR and FAA's ROD on the Final EIS.

In accordance with the Secretary of EEA's Certificate on the FEIR, Massport amended its final Section 61 Findings issued in 2001 to incorporate mitigation measures added or refined through the federal environmental review process. As a result, Massport amended its initial Section 61 Findings on October 21, 2004, to include mitigation measures required in FAA's ROD.

In April 2007, FAA issued an ROD on the centerfield taxiway improvements based on its review of supplemental information.

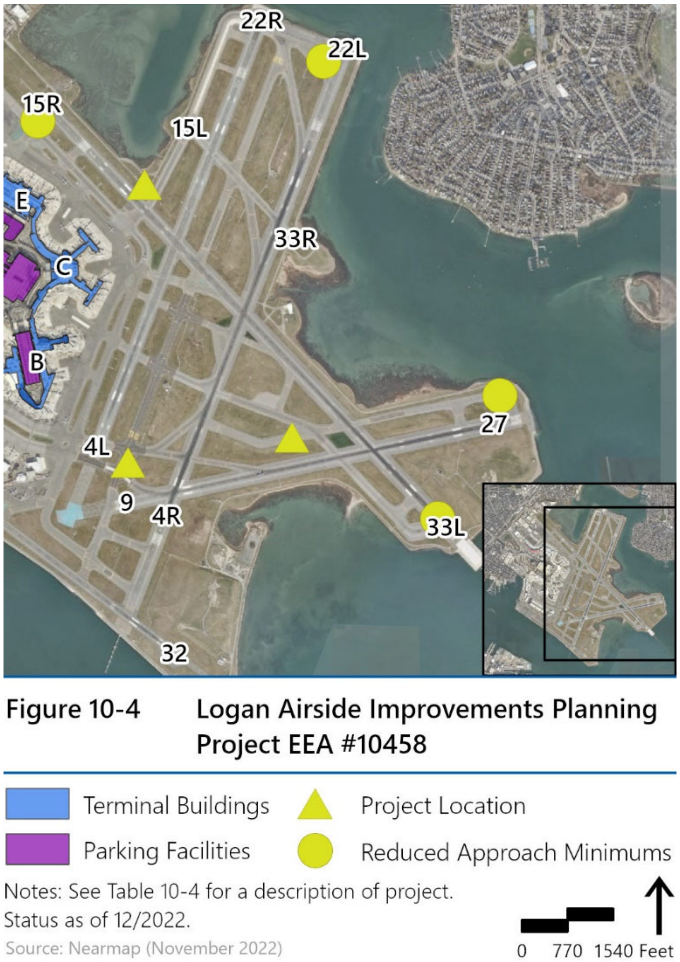

Figure 10-4 Logan Airside Improvements Planning Project EEA #10458

Notes: See Table 10-4 for a description of project.
Status as of 12/2022.
Source: Nearmap (November 2022)

10.5.2 Project Status

- Runway construction commenced in 2004. Runway 14-32 opened on November 23, 2006. The first full year of operation of Runway 14-32 was 2007.
- Realignment of the southwest corner taxiway system was completed in 2007.
- Taxiway D extension was completed in 2010.
- Taxiway N realignment remains under consideration for a future action.
- Reduction in approach minimums on Runway 15R and 33L were implemented in 2013 following completion of the 33L Light Pier replacement and FAA testing of new **Instrument Landing System (ILS)** equipment.

Reduction in approach minimums on Runway 15R and 33L were approved in the EIS. However, implementation for approach minimum reductions depended upon realignment of the ILS. The construction impacts of relocating the ILS localizer and new Category III ILS equipment were addressed in the environmental review of the RSA enhancements for Runway 33L (EEA #14442). The Category III ILS began operations in 2013.

Table 10-5 summarizes the mitigation measures contained in the amended Section 61 Findings issued on October 21, 2004 and reports on the status of implementation. **Table 10-5** addresses only ongoing requirements, and it is noted when there are recent updates. Documentation on design and construction measures is provided in previous EDRs and ESPRs.

Table 10-5 Logan Airside Improvements Planning Project (EEA #10458) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measures	Status
Runway 14-32 Operations and Construction Mitigation	
Operational procedures for unidirectional Runway 14-32 will include over-water flight operations only, arrival operations in east-to-west direction from Runway 32 approach end, and departure operations from west-to-east direction from the Runway 14 departure end. Massport will enter into contract with appropriate government body and/or community group(s) to enforce intended unidirectional runway, if requested. Lighting, marking, and instrumental components of Runway 14-32 will be designed for a unidirectional runway. No parallel or other type taxiway facility will be constructed to allow east-to-west direction departures from the Runway 32 end. *The Federal Aviation Administration (FAA) endorsed the unidirectional limitations on Runway 14-32 and has agreed to develop air traffic control procedures to ensure safe and efficient operation of the unidirectional limitation, subject to variances that may be required to accommodate particular aircraft emergencies.*	Implemented.
Wind-Restricted Use of Runway 14-32	
Restrict the use of Runway 14-32 to those times when winds are equal to or greater than 10 knots from the northwest or southeast (between 275 degrees and 005 degrees, or 095 degrees and 185 degrees, respectively).	Implemented.
Mitigation Policies/Programs	
Regional Transportation Policy	
Engage in promoting increased utilization of regional airports. *Cooperative transportation planning with the various transportation agencies to ensure an integrated regional transportation infrastructure (including improved highways, public transportation, high-speed rail, private transportation services to improve regional airport access).*	Implemented.
Massport will continue to exercise operational control over Worcester Regional Airport.	Implemented.
Massport will continue to attract new air service to Worcester Regional Airport.	Implemented.
Traveler and air service awareness will be provided to Worcester Regional Airport via marketing campaigns.	Implemented.
Develop and maintain an aviation information database to include: aviation trend tracking reports for distribution to interested parties; statistical summaries of passenger levels, aircraft operations and airline schedule data at major New England regional airports; include a summary of regional airport trends and service developments in an Annual Report.	Implemented.

Table 10-5 Logan Airside Improvements Planning Project (EEA #10458) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measures	Status
Participate in other regional/state aviation forums.	Implemented.
Continue to work with FAA/regional airport directors to complete a New England Airports System Study to evaluate regional airports performance. FAA committed to work with other participants in the preparation of the study.	Implemented.
Encourage transportation initiatives such as commuter rail, rail or other links between regional airports by relevant agencies or other governmental bodies through Transportation Bond Bill or other legislative initiatives to implement an improved effective regional transportation system.	Implemented.
Continue to support inter-city rail planning through the Boston Metropolitan Planning Organization (MPO).	Implemented.
Allow Massport's Logan Express satellite parking lots and stations available for third-party bus and park-and-ride connections to other regional airports, including Worcester, Manchester, and Providence.	Implemented.
Sound Insulation	
Sound insulation is being provided within the Boston Logan Airside Improvements Planning Project Mitigation Contour including the affected residences of Chelsea, East Boston, Winthrop, and Revere. Through special project mitigations, FAA funding will be provided for residences with building code considerations to allow for the necessary upgrades thereby ensuring eligibility and participation in the sound insulation program. If FAA funding is unavailable to complete sound insulation to residences within the Day-Night Average Sound Level (DNL) 65 decibel (dB) contour as a result of project implementation, Massport will provide the funding.	Implemented.
Preferential Runway Advisory System (PRAS)	
Massport will develop and implement a PRAS monitoring system and a new distribution system for reporting that will expand the contents of Massport's Quarterly Noise Reports and will involve the expansion of the distribution list to include the [Massport Community Advisory Committee (Massport CAC)]. Runway utilization, dwell, and persistence reports will be included in the Environmental Status and Planning Report (ESPR) filings with the Massachusetts Environmental Policy Act (MEPA). Massport will continue to work with FAA to design additional reports to enhance the attainment of PRAS and Massport will begin to work with Massport CAC to update PRAS. The current PRAS system will remain in place until superseded.	Implemented.

Table 10-5 Logan Airside Improvements Planning Project (EEA #10458) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measures	Status
Noise Abatement Study	
FAA has committed to undertake a noise abatement study that will include enhancing existing or developing new noise abatement measures applicable to aircraft overflight impacts, which will take into account environmental benefit, operational impact, aviation safety and efficiency, and consistency with applicable legal requirements. The scope of this study has been completed through the joint efforts of FAA, the Massport CAC, and Massport as required by the ROD. Massport will work with the Massport CAC and FAA to assess the existing PRAS at Logan Airport in accordance with Section 10.0 of the Section 61 Findings and will continue to participate in the noise study as contemplated in the ROD.	Implemented.
Peak Period Monitoring and Demand Management Program (DMP)	
Massport will develop and implement a Peak Period Pricing (PPP) program or an alternative DMP. Massport will identify standards to allow airlines to accurately predict scheduling costs and modify accordingly. Massport will establish and maintain a monitoring system. *Massport will comply with its commitments with respect to PPP or alternate DMP. FAA has indicated in the ROD that it stands ready to assist Massport in this endeavor.*	Implemented.
Single Engine Taxi Procedures	
Develop and implement a program designed to maximize the use of single engine procedures by all tenant airlines, consistent with safety requirements, pilot judgment, and federal law requirements.	Implemented.
Report on Progress of Logan Transportation Management Association (TMA).	Implemented.

Source: Massport.
Note: The mitigation measures in *italics* are those that were referenced in FAA's ROD and later incorporated into the Section 61 Findings amended on October 21, 2004.

10.6 Southwest Service Area (SWSA) Redevelopment Program – EEA #14137

Massport completed the consolidated Rental Car Center (RCC), in 2014, which was the major element of the SWSA program. In addition to customer service benefits, consolidation of the rental car operations and their shuttle buses into one coordinated operation has resulted in reduced vehicle miles traveled (VMT) and reduced air emissions. **Figure 10-5** illustrates the location of the SWSA.

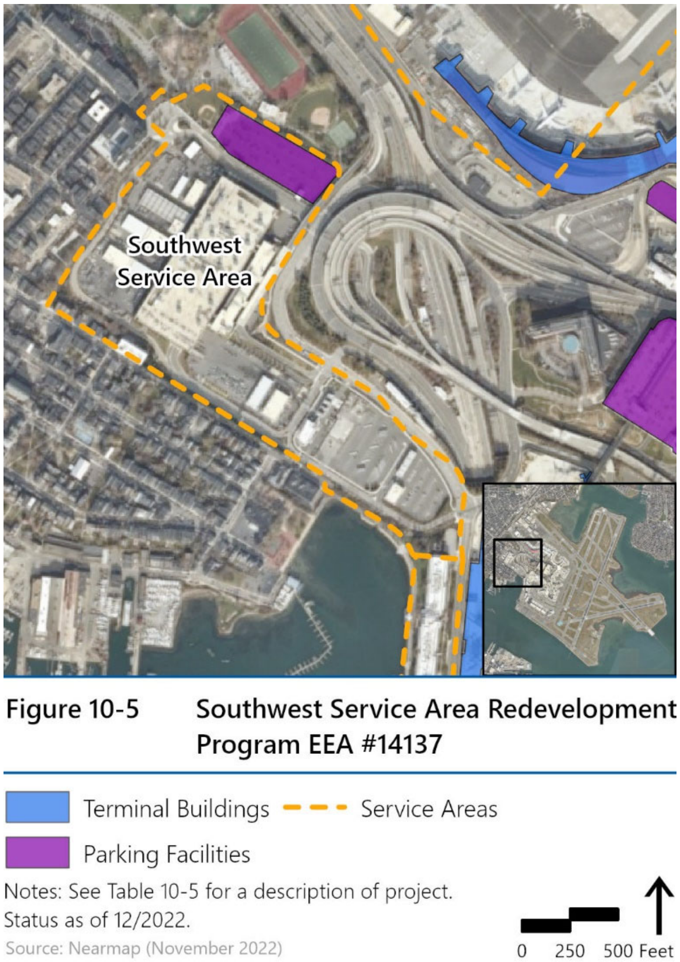

Figure 10-5 Southwest Service Area Redevelopment Program EEA #14137

10.6.1 Permitting History

- Certificate on the FEIR issued on May 28, 2010.
- Section 61 Findings submitted to EEA on June 29, 2010.

10.6.2 Project Status

Construction of enabling projects commenced in late summer 2010 and final design of the facility continued through 2011. Although there was a phased opening, the project was completed and fully operational by the end of 2015. Logan Airport's 21 CNG buses and 32 clean diesel or electric buses have replaced the entire fleet of diesel rental car shuttle buses that previously served the individual rental car companies. An additional CNG bus was put into service in 2016, increasing the total to 22 CNG buses. The RCC was awarded Logan Airport's first LEED® Gold certification in 2015.

Table 10-6 outlines Section 61 mitigation commitments of the SWSA Redevelopment Program, which Massport, the construction contractors, and the rental car companies have implemented as part of the design, construction, and operation of the facility. This project is now complete, and measures that were completed in the design and construction phases will no longer be tracked in the EDR or ESPR. The *2017 ESPR* presents the last full summary of those measures. Ongoing Section 61 commitments will continue to be updated annually, as appropriate.

Table 10-6 **Southwest Service Area (SWSA) Redevelopment Program (EEA #14137) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)**

Mitigation Measure	Status
Noise Reduction Measures	
Eliminate individual rental car shuttle buses and combine Massport Airport Station buses (routes 22/33/55) through the Unified Bus System; thereby, reducing the overall number of rental car-related buses circulating on-Airport and associated noise.	Implemented.
Airport Transportation System Improvements	
Reduce the rental car shuttle bus fleet by approximately 70 percent through the creation of the Unified Bus System when compared to the 2007 Existing Condition and future No-Build/ No-Action Conditions.	Implemented.
Reduce rental car shuttle bus terminal curbside congestion through the creation of the Unified Bus System resulting in reduced emissions.	Implemented
Utilize clean- and low-emission fuel for the Unified Bus System to further reduce emissions.	Implemented
Install Intelligent Transportation System features, as part of the Unified Bus System to further reduce emissions and improve operational efficiency.	Implemented
Implement new wayfinding signage to increase the efficiency of the circulating vehicles within and around the SWSA.	Implemented
Pedestrian and Bicycle Facilities	
Provide new pedestrian and bicycle facilities, including secure and covered bicycle storage at the Customer Service Center (CSC) and Quick Turnaround Areas (QTA) buildings for employees, customers, and the general public, as well as shower/changing facilities within the QTA buildings for employees.	Implemented.
Provide enhanced pedestrian connections to and from the SWSA, airport terminals, the Logan Office Center, Memorial Stadium Park, Bremen Street Park, the Harborwalk, on-Airport buses, public transit (Massachusetts Bay Transportation Authority (MBTA) Airport Station), along Porter Street, and surrounding East Boston neighborhoods.	Implemented.
Provide street and pedestrian-level lighting and advanced warning signals and/or systems at crosswalks.	Implemented.
Transportation Demand Management (TDM) Plan	
Provide limited SWSA employee parking on-site.	Implemented.
Provide new access to public transit through the Unified Bus System (direct connection to MBTA Blue Line at Airport Station) and new/enhanced pedestrian facilities at the station.	Implemented.
Require rental car companies to participate in the Logan Transportation Management Association (TMA).	Implemented.

Table 10-6 Southwest Service Area (SWSA) Redevelopment Program (EEA #14137) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Alternative-Fuel Vehicles	
The rental car companies would provide fuel-efficient and/or alternative-fueled rental vehicles (quantity to be determined by the rental car companies).	Implemented.

Source: Massport.
Note: The mitigation measures in *italics* are those that were referenced in FAA's ROD, and later incorporated into the Section 61 Findings as amended on June 29, 2010.

10.7 Logan Airport Runway Safety Area (RSA) Project – EEA #14442

As described in previous EDRs and ESPRs, Massport has periodically undertaken RSA improvements and other safety improvements on the Logan Airport airfield. Massport completed safety improvements for Runways 4L, 4R, 22L, and 27 under EEA #5122. In 2005, Massport undertook safety improvements at Runway 22R with the construction of an **Engineered Materials Arresting System (EMAS)** bed at the end of the runway in compliance with FAA directives, although no MEPA review was needed. In 2006, as part of a separate project, Massport installed an EMAS bed beyond the end of Runway 33L. This project considered further safety enhancements to the Runway 33L and Runway 22R RSAs. Massport prepared a combined EA in accordance with **National Environmental Policy Act of 1969 (NEPA)**, and an EIR in accordance with MEPA for the proposed enhancements at the Runway 33L and Runway 22R RSAs. The ENF was filed with MEPA on June 30, 2009, and the Draft EA and EIR was submitted to the FAA and EEA on July 15, 2010. The Final EA and EIR was submitted to the FAA and EEA on January 31, 2011. **Figure 10-6** shows the location of the RSA projects at Logan Airport.

The Runway 33L RSA improvements included a 600-foot-long RSA beyond the end of the runway, and an EMAS bed, which includes portions set upon a 460-foot long by 300-foot-wide pile-supported deck extending over Boston Harbor. Additional elements of the RSA improvements included two emergency access ramps located on both sides of the deck and a relocation of the perimeter access road. Construction of the pile-supported deck was completed in November 2012.

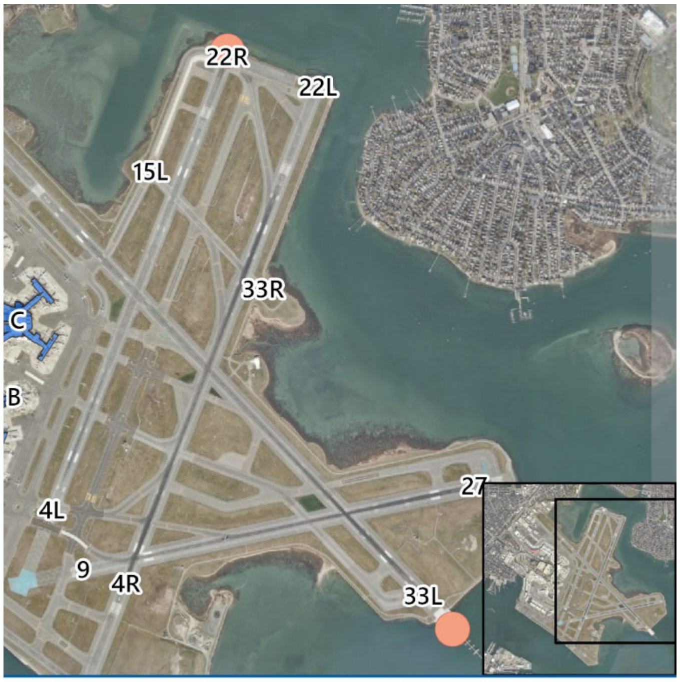

Figure 10-6 Logan Airport Runway Safety Area Improvement Program EEA #14442

Terminal Buildings
Project Location
Parking Facilities

Notes: See Table 10-6 for a description of project.
Status of as 12/2022.
Source: Nearmap (November 2022)

0 725 1450 Feet

10.7.1 Permitting History

- Certificate on the Final EA and EIR issued on March 18, 2011.
- FAA issued a FONSI on April 4, 2011, which documents that the proposed federal action is consistent with the NEPA and other applicable environmental requirements and will not significantly affect the quality of the human environment with the mitigation requirements referenced in **Table 10-7**.
- Section 61 Findings were submitted to EEA on May 27, 2011 and published in the *Environmental Monitor* on June 8, 2011.
- Certificate on the **Notice of Project Change (NPC)** for the replacement of the Runway 33L approach light pier was issued on March 9, 2012.
- On April 12, 2012, the FAA found that the replacement of the Runway 33L approach light pier was a **Categorical Exclusion (CATEX)** and thus exempt from further consideration under NEPA.

10.7.2 Project Status

- Runway 33L RSA construction commenced in June 2011 and was completed in November 2012.
- Replacement of the Runway 33L approach light pier commenced in July 2012 and was completed in November 2012. The upgraded Category III system was put into service in 2013.
- The Runway 22R improvements were completed in 2014.

The Runway 33L RSA project replaced the inner 500 feet of the existing light pier. As construction progressed on the Runway 33L RSA improvements, Massport determined that it would be feasible to replace the remaining Runway 33L approach light pier.

In the summer of 2012, Massport began replacing approximately 1,900 feet of the existing timber light pier that extends approximately 2,400 feet southeast of Runway End 33L. The existing timber pier was replaced with a new concrete structure along the runway centerline, approximately 10 feet south of the old pier, using concrete pilings. The in-kind replacement reduced the total number of pilings significantly, from over 500 to approximately 150. As part of the reconstruction, the new light pier was also constructed to accommodate upgraded **navigational aids (NAVAIDs)**. The pier improvements provide the infrastructure necessary to support NAVAIDs that facilitate implementation of the reduced aircraft approach minimums previously reviewed and approved by the FAA in a ROD dated August 2, 2002 for the Logan Airside Improvements Planning Project identified as EEA #10458. Massport filed an NPC with MEPA for the proposed light pier replacement on January 31, 2012. On March 9, 2012, the Secretary of the EEA issued an NPC Certificate determining that no further MEPA review was required for the light pier replacement. On April 12, 2012, the FAA found the replacement of the Runway 33L approach light pier was eligible for a CATEX and thus was exempt from further review under NEPA.

The Runway 22R improvements completed in 2014 enhanced the existing RSA by constructing an ISA, similar to the ISA constructed at the Runway 22L end. Construction of the Runway 22R ISA has been completed. **Table 10-7** lists the Section 61 mitigation commitments for the Logan Airport RSA Project and Massport's progress in achieving these measures.

Table 10-7 Logan Airport Runway Safety Area Improvement Program (EEA # 14442) Section 61 Mitigation Commitments to be Implemented (as of December 31, 2022)

Mitigation Measure	Status
Protected Resources	
Eelgrass (Runway-End 33L Only)	
Develop a mitigation program that will replace lost eelgrass area and functions by creation of new eelgrass, at a 3:1 replacement to loss ratio.	Implemented.
Salt Marsh (Runway-End 22R Only)	
Restore new salt marsh at a 2:1 replacement to loss ratio.	Implemented.
Monitor compensatory salt marsh for success and invasive plant species, and implement an invasive species control plan.	Implemented. Annual monitoring and agency reporting continued through 2022.
Shellfish	
Monitor pilings and substrate at Runway 33L.	Implemented.
Restore approximately 1.1 acres of habitat.	Implemented.
Harvest and transplant shellfish from the footprint of the Runway 22R Inclined Safety Area (ISA).	Not Implemented.
Execute Memorandum of Agreement (MOA) with the Massachusetts Division of Marine Fisheries for resource enhancement.	Implemented.

Table 10-7 Logan Airport Runway Safety Area Improvement Program (EEA # 14442) Section 61 Mitigation Commitments to be Implemented (as of December 31, 2022)

Mitigation Measure	Status
State-Listed Rare Species	
Identify equivalent area of pavement for removal to maintain area of available habitat at Logan Airport for the upland sandpiper if required by the Massachusetts Natural Heritage and Endangered Species Program.	Implemented.

Source: Massport.

Note: The mitigation measures in *italics* are those that were referenced in FAA's ROD and later incorporated into the Section 61 Findings as amended on May 27, 2011.

10.8 Terminal E Modernization – EEA #15434

The Terminal E Modernization Project will add seven new gates to Terminal E in two phases, with four gates in Phase I and three gates in Phase 2. Of the seven gates, three were already approved under MEPA in 1996 for the International Gateway Project, but the International Gateway Project MEPA-approved gates were never constructed. The existing concourse, terminal core, and terminal roadway frontages are collectively, known as the "Project," and these areas will also be extended. Implementation of the Project will better accommodate the current and projected demand for international travel that is expected to occur, regardless of the Project's status.

Figure 10-7 shows the location of the Terminal E Modernization Project. **Table 10-8** lists each of the Section 61 mitigation commitments for the Terminal E Modernization Project and Massport's progress in achieving these measures. Future EDRs and ESPRs will provide updates, as available.

Figure 10-7 Terminal E Modernization EEA #15434

Terminal Buildings
Project Location
Parking Facilities

Notes: See Table 10-7 for a description of project.
Status as of 12/2022.
Source: Nearmap (November 2022)

0 310 620 Feet

10.8.1 Permitting History

- Certificate on the ENF issued on December 16, 2015.
- Certificate on the Draft EIR issued on September 16, 2016.
- Certificate on the FEIR issued on November 10, 2016
- FAA FONSI and ROD issued on November 14, 2016.
- Section 61 Findings approved on January 19, 2017.

10.8.2 Project Status

Construction of the Project began in 2019 with an enabling project to replace the Logan Gas Station constructed within the SWSA along Jeffries Street. In June 2020, the construction program was slowed in response to the COVID-19 pandemic and resulting passenger and revenue declines; however, four new gates will be added to International Terminal E with completion of Phase I in summer of 2023. Currently, Phase II of the project is deferred. A revised schedule to complete the remaining tasks, which include the completion of the three gates and pedestrian connection with the Blue Line Airport Station, will be provided in future EDRs and ESPRs.

Table 10-8 Terminal E Modernization Project (EEA #15434) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Overall Project Benefits	
Provide pedestrian access between Terminal E and Massachusetts Bay Transportation Authority (MBTA) Airport Blue Line-Station.	Upon completion of Phase II, a covered pedestrian connection between Terminal E and the MBTA Blue Line Airport Station will be constructed to improve passenger convenience. Various approaches are under consideration and will be further documented in subsequent environmental filings and EDRs or ESPRs.
Construct roadway and curb improvements to improve vehicle flow, high occupancy vehicle (HOV) access, and reduce air and GHG emissions.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Site Terminal E additions so as to buffer the adjacent neighborhoods from aircraft noise.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Seek Leadership in Energy and Environmental Design (LEED®) certification at Silver level or better; meet or exceed Massachusetts (MA) LEED® Plus program goals.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Provide 400 Hz of power and pre-conditioned air at the new aircraft gates.	400 Hz power and preconditioned air will be installed at the new gates when constructed.

Table 10-8 Terminal E Modernization Project (EEA #15434) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Site Planning and Sustainable Design/Greenhouse Gas Reduction	
Incorporate sustainable design in design, construction, and operations including:	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Improved building envelope;	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Improved Air Handling Units;	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Efficient water loops;	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Reduced interior lighting power density.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Specify roofing materials with a minimum reflectance rating of 0.70 and emittance value of at least 0.75 for a minimum of 75% of the available roof area. Install non-glare roofing materials.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Incorporate infrastructure for collection, storage, and handling of recyclable materials.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Require contractor to develop a construction waste management plan that requires diversion or reduction of construction waste by at least 75%.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Establish a project-specific goal for sourcing materials extracted, harvested, recovered, and or manufactured within New England.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Design project to achieve energy efficiencies of a minimum of 20% below the MA Energy Code.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Include water conservation devices that reduce water use by 20% below code.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Include a minimum of 25,000 square feet of roof top solar photovoltaic system (approximately 300kW). Heat restroom hot water with solar units.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR. The Terminal E expansion includes a planned 300,000-kilowatt hour (kWh) rooftop solar array.
Incorporate occupancy sensors in all indoor areas to reduce electrical demand.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Evaluate other energy efficiency/greenhouse gas reduction measures as project design progresses.	Phase I is complete and Phase II is being advanced consistent with the decisions on these measures, as recorded in the Final EA or EIR.

Table 10-8 Terminal E Modernization Project (EEA #15434) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Air Quality	
Reduce operational-related carbon dioxide (CO_2) emissions associated with the Project by a minimum of 30% percent.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Stormwater Management	
Replace and upgrade stormwater management.	Phase I is complete and Phase II is being advanced consistent with the commitments in the Final EA or EIR.
Construction Period Impacts	
In accordance with DEP's Clean Air Construction Initiative, the Authority will require that construction contractors to install emission control devices such as diesel oxidation catalyst and/or particulate filters on certain equipment types (i.e., front-end loaders, backhoes, excavators, cranes, and air compressors).	Implemented.
Retrofitting of certain construction equipment types with emission controls such as diesel oxidation catalyst and/or particulate filters.	Implemented.
Selection of high efficiency "temporary" space heating/cooling systems.	Implemented.
Remediate subsurface contamination, as necessary, if encountered during tank removals or other excavation activities as part of construction (in compliance with the Massachusetts Contingency Plan).	Implemented.
Soil treatment and reuse on site as part of a Soil Management Plan.	Implemented.
Voluntary compliance with the requirements of City of Boston noise ordinances, including restrictions on the types of equipment that can be used, and limitations on the hours when certain activities can take place (the City of Boston noise ordinance establishes restrictions during the construction hours between 7:00 PM and 7:00 AM).	Implemented.
Construction worker vehicle trip limitation, including requiring contractors to provide off-Airport parking and use of high-occupancy vehicle transportation modes for employees.	Implemented.
Implement Indoor Air Quality (IAQ) Management Plan during construction.	Implemented.

Table 10-8 Terminal E Modernization Project (EEA #15434) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Construction Traffic Operations	
Construction-related traffic will be required to access and egress through the North Gate using only state and federal highways and the Airport roadway network. Construction- related traffic on local East Boston roadways will be prohibited.	Implemented.
Construction Traffic Operations	
Construction employee parking spaces will not be permitted on the construction site nor will provisions be made for them elsewhere on-Airport with the exception of a small number of spaces for supervisory personnel. The Authority will require contractors on this Project to implement construction worker vehicle trip management measures, including requiring off-Airport parking and HOV transportation modes for contractor employees.	Implemented.
Police details will be employed, as needed, to manage traffic and ensure public safety.	Implemented.
Construction Air Quality	
Construction emissions will be reduced and controlled by mandatory contractor implementation of the following best practices:	Implemented.
Construction Air Quality	
Encouragement for construction-worker site access/egress using dedicated buses and vans;	Implemented.
Reduction of exposed erodible surface areas to the extent feasible;	Implemented.
Covering of exposed surface areas with pavement or vegetation in an expeditious manner and periodic watering;	Implemented.
Minimizing equipment idling times;	Implemented.
Reduction of on-site vehicle speeds;	Implemented.
Ensuring contractor implementation of appropriate fugitive dust and equipment exhaust controls;	Implemented.
Use of low- or zero-emissions equipment to the maximum extent feasible; and	Implemented.
Use of covered haul trucks during materials transportation.	Implemented.

Table 10-8 Terminal E Modernization Project (EEA #15434) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Construction Noise	
Require construction equipment to deploy noise-reduction measures, such as the use of proper mufflers, measures to limit noise from truck traffic. Primarily operate only during daylight hours (7:00 AM to 7:00 PM).	Implemented.

Source: Massport.

10.9 Logan Airport Parking Project – EEA #15665

Logan Airport Parking Project includes the construction of up to 5,000 new commercial parking spaces in front of Terminal E which is currently used for surface parking. The updated Logan Airport Parking Project will add approximately 4,300 commercial revenue spaces, which would be built in a new garage in front of Terminal E. No parking spaces are being proposed for the Economy Garage at this time. Located in the central terminal area of the Airport, the new Garage will also improve connectivity to the existing parking complex and Airport roadways.

The approximately 4,300 spaces will be accommodated in a nine-story facility, with commercial parking beginning on the second floor. The facility will be served by EV charging facilities to support Massport's Net Zero goal.

The new Garage will be connected to existing facilities:

- New pedestrian bridges will connect from the garage to Terminal C Pier A and from the garage to the west side of Terminal E.
- The existing pedestrian bridge between the West Garage and Terminal E will be dismantled for the portion within the footprint of the new garage and the

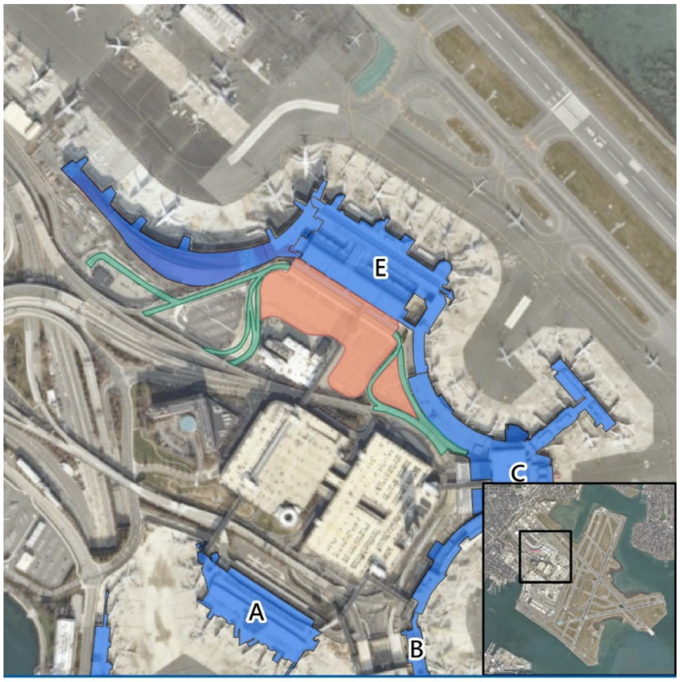

Figure 10-8 Logan Airport Parking Project EEA #15665

Notes: See Table 10-8 for a description of project.
Status as of 12/2022.
Source: Nearmap (November 2022)

walkway will be integrated into the Garage floor plan to allow for better vehicular and pedestrian circulation.

- A vehicular bridge will connect the fourth level of the West Garage to the new garage.

In addition, the Project will also include roadway enhancements and curb reconfiguration to improve vehicle access, particularly for HOV, and minimize idling time at curbs.

Future EDRs and ESPRs will provide updates on the project, as available. **Figure 10-8** shows the location of the Logan Airport Parking Project. **Table 10-9** lists each of the Section 61 mitigation commitments for the Logan Airport Parking Project and Massport's progress in achieving these measures.

10.9.1 Permitting History

- Certificate on the ENF issued on May 5, 2017.
- Certificate on the Draft EIR issued on August 2, 2019.
- Certificate on the FEIR issued on January 30, 2020.

10.9.2 Project Status

In 2018, MassDEP and the U.S.EPA approved an amendment to the Logan Parking Freeze to add an additional 5,000 spaces at Logan Airport. Massport filed an Environmental Impact Report (EIR) and MEPA issued a Certificate (January 2020) approving new parking in two Airport campus locations in a new Garage across from Terminal E (2,000 spaces), and additional floors at Economy Garage (3,000 spaces).

Construction of the MEPA- and FAA-approved Garage in front of Terminal E was put on pause during the pandemic. As passenger demand has rebounded, the demand for commercial parking has again increased. In late 2023, Massport moved into the preliminary design process for the garage, taking current conditions into account, and reconfirmed the need for additional parking spaces to encourage long-term parking at the Airport, rather than two trips for drop-off and pick-up.

The updated Garage in front of Terminal E will continue to comply with the Logan Airport Parking Freeze and allow Massport to recover 2,000 lost spaces formerly located in Central Garage and in Terminal B Garage lost due to HOV and RideApp initiatives at Terminals B and C. As of this filing, Logan Airport accommodates 7,000 commercial spaces below the Logan Airport Parking Freeze. With the new garage, the Airport will remain 3,000 commercial spaces below the Logan Airport parking freeze limit. Further details on this project are included in Chapter 4, Section 4.1.

Table 10-9 Logan Airport Parking Project (EEA #15665) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Overall Project Benefits	
Accommodate existing and anticipated air passenger demand for parking to reduce drop-off/pick-up mode share and associated vehicle miles travelled (VMT) and on-Airport and off-Airport air emissions.	Preliminary design is ongoing and mitigation measures will follow when design and implementation proceed. The new parking spaces will be constructed to reduce drop-off and pick-up mode share and associated vehicle miles traveled and on-Airport and off-Airport air emissions.
Reuse existing developed areas (i.e., the Project sites avoid undeveloped, greenfield lands).	The surface parking lot in front of Terminal E is fully developed and currently in use for parking.
Selecting project sites with community input that are in areas already used for parking, are on existing bus/shuttle routes, and are separated from nearby residential communities	The surface parking lot in front of Terminal E was selected as the project site with community input. It is on existing bus or shuttle routes and are separated from nearby residential communities.
Providing added noise barrier benefits in conjunction with the Terminal E Modernization Project, through the expansion of the existing Economy Garage.	The project no longer includes building atop the Economy Garage and is fully located in the center of the Airport, away from the community.
Providing dynamic signage/messaging, parking reservation system, and parking guidance via electronic space occupancy detection to reduce on-Airport circulation as well as associated VMT and air emissions.	Final design will include these measures to reduce on-Airport circulation as well as associated VMT and air emissions.
Sustainability and Resiliency	
Incorporating measures from the U.S.GBC Parksmart rating system into the project's technology, structural design, and operation	Mitigation measures will be implemented when design and construction proceeds.
Reducing lighting power densities from a base of 0.19 watts per square foot to a maximum of 0.05 watts per square foot.	Mitigation measures will be implemented when design and construction proceeds.
Installing occupancy sensors and photocells on all applicable interior and exterior lighting	Mitigation measures will be implemented when design and construction proceeds.
Installing programmable thermostats where applicable (i.e., mechanical/electrical rooms)	Mitigation measures will be implemented when design and construction proceeds.
Designing the parking decks to be open air, negating the need for ventilation systems	All new parking spaces will be open air.
Performing building commissioning in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1-2007	Mitigation measures will be implemented when design and construction proceeds.
Incorporating a solar photovoltaic (PV) system at the new garage in front of Terminal E capable of offsetting 50 percent of the facility's total energy consumption.	Mitigation measures will be implemented when design and construction proceeds.

Table 10-9 Logan Airport Parking Project (EEA #15665) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Relocating the existing solar PV system at the new garage in front of Terminal E capable of offsetting 50 percent of the facility's total energy consumption, including all lighting and power required for its electric vehicle (EV) charging stations.	Mitigation measures will be implemented when design and construction proceeds.
Reserving parking spaces for alternative fuel vehicles (e.g., EVs) amounting to at least 1 percent of total spaces and assigning preferred parking spaces for other low-emitting and fuel-efficient vehicles amounting to at least another 1 percent of total spaces.	Mitigation measures will be implemented when design and construction proceeds.
Installing 11 EV charging stations (22 ports) in the new garage in front of Terminal E.	Mitigation measures will be implemented when design and construction proceeds.
Designing and building the proposed garages to accommodate expanded EV charging infrastructures to accommodate 150 percent of demand.	Mitigation measures will be implemented when design and construction proceeds.
Integrating vertical landscaping into the façade of the new garage in front of Terminal E.	Mitigation measures will be implemented when design and construction proceeds.
Adhering to durable design principles and a preventative maintenance plan to extend facility lifespan and avoid greenhouse gas emissions caused by future large-scale construction and renovation activities.	Mitigation measures will be implemented when design and construction proceeds.
Installing and applying only no- or low-volatile organic compound (VOC) coatings, paints, and sealants.	Mitigation measures will be implemented when design and construction proceeds.
Installing halon-free fire suppression systems in each garage.	Mitigation measures will be implemented when design and construction proceeds.
Complying with Massport's Floodproofing Design Guide and elevating critical equipment and systems above the designated design flood elevations.	Mitigation measures will be implemented when design and construction proceed.
Implementing an active recycling program to reduce the amount of waste sent to regional landfills/incinerators and to reduce greenhouse gas emissions associated with material disposal.	Mitigation measures will be implemented when design and construction proceeds.
Displaying educational materials to convey the facilities' environmentally sustainable design and operations.	Mitigation measures will be implemented when design and construction proceeds.

Table 10-9 Logan Airport Parking Project (EEA #15665) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Construction Period Mitigation	
Providing on-Airport storage areas for construction materials.	Mitigation measures will be implemented when design and construction proceeds.
Coordinating the arrival of large construction equipment among various on-Airport projects and limiting their arrival or removal during peak travel hours (both Airport and commuter peaks).	Mitigation measures will be implemented when design and construction proceeds.
Developing specific truck routing and/or staging plans for implementation by the various contractors.	Mitigation measures will be implemented when design and construction proceeds.
Requiring construction managers to prepare: • *Draft Soil Management Plan;* • *Draft Stormwater Pollution Prevention Plan;* • *Draft Management Plan for Dewatering, if needed;* • *Draft Health and Safety Plan.*	Mitigation measures will be implemented when design and construction proceeds.
Employing a Construction Waste Management Plan that requires at least 85 percent of materials to be recycled or reused.	Mitigation measures will be implemented when design and construction proceeds.
Controlling rodents through routine inspection, monitoring, and treatment.	Mitigation measures will be implemented when design and construction proceeds.
Prioritizing the use of construction equipment and materials that are repurposed, reused, or recycled (or contain recycled content), where feasible.	Mitigation measures will be implemented when design and construction proceeds.
Prioritizing construction equipment and materials that are sourced regionally (i.e., within 300 miles of the Project sites) to reduce greenhouse gas emissions associated with their transport.	Mitigation measures will be implemented when design and construction proceeds.
Using regional (i.e., within 75 miles) labor to the greatest extent practicable.	Mitigation measures will be implemented when design and construction proceeds.
Encouraging construction companies to provide off-Airport parking for their employees and to provide shuttle services from these locations (shuttles are required to use the Coughlin Bypass road to access the Airport).	Mitigation measures will be implemented when design and construction proceeds.
Requiring all construction vehicle/equipment to follow anti-idling procedures and all construction managers to provide associated training.	Mitigation measures will be implemented when design and construction proceeds.
Requiring the use of low- or zero-emissions equipment, where practicable.	Mitigation measures will be implemented when design and construction proceeds.

Table 10-9 Logan Airport Parking Project (EEA #15665) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Requiring the retrofitting of appropriate diesel construction equipment with diesel oxidation catalyst and/or particulate filters.	Mitigation measures will be implemented when design and construction proceeds.
Requiring contractors to use Ultra Low Sulfur Diesel Fuel (ULSD).	Mitigation measures will be implemented when design and construction proceeds.
Maintaining low on-site vehicle speeds.	Mitigation measures will be implemented when design and construction proceeds.
Deploying air quality and fugitive dust management best practices, such as reducing exposed erodible surface areas through appropriate materials and equipment staging, covering exposed surface areas with pavement or vegetation in an expeditious manner, and stabilizing soil with cover or periodic watering.	Mitigation measures will be implemented when design and construction proceeds.
Using and maintaining construction equipment appropriately to avoid unnecessary noise and applying noise-reduction measures to reduce noise from pile driving by at least 5 A-weighted decibels (dBA) below their unmitigated levels 1.	Mitigation measures will be implemented when design and construction proceeds.
Requiring trucks to access the Project sites by Route 1A, Interstate 90, Coughlin Bypass Road, and the main Airport roadway only or other routes in compliance with transportation safety requirements.	Mitigation measures will be implemented when design and construction proceeds.
Prohibiting trucks from using local streets.	Mitigation measures will be implemented when design and construction proceeds.
Specifying truck routes in contractors' construction specifications.	Mitigation measures will be implemented when design and construction proceeds.
Using concrete production and batching plants with access via Route 1A or Interstate 90.	Mitigation measures will be implemented when design and construction proceeds.
Encouraging construction workers to use MBTA transit services, Logan Express, the water shuttle, and other high-occupancy modes of travel.	Mitigation measures will be implemented when design and construction proceeds.
Putting into place an Erosion and Sedimentation Control Program, in compliance with the Stormwater Pollution Prevention Plan, to protect water quality and to minimize construction phase impacts to Boston Harbor.	Mitigation measures will be implemented when design and construction proceeds.
Deploying spill prevention measures and sedimentation controls throughout the construction phases to prevent pollution from construction equipment and erosion.	Mitigation measures will be implemented when design and construction proceeds.

Table 10-9 Logan Airport Parking Project (EEA #15665) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Using the following erosion and sedimentation controls throughout the construction phases: • *Perimeter barriers such as straw wattles or compost-filled "silt sock" barriers will be placed around upland work areas to trap sediment transported by runoff before it reaches the drainage system or leaves the construction site;* • *Existing catch basins within the work sites will be protected with barriers (where appropriate) or silt sacks;* • *Open soil surfaces will be stabilized within 14 days after grading or construction activities have temporarily or permanently ceased.*	Mitigation measures will be implemented when design and construction proceeds.
Ground Access Improvement, Trip Reduction, and Emissions Reduction	
Implement the following ground access improvement, trip reduction, and emission reduction initiatives: • *Advance the electrification of ground service equipment, pursuant to which all ground service equipment will be replaced no later than the end of 2027 (as available);* • *Expand Logan Express capacity by 10 percent;* • *Increase the percentage of zero emission taxi, livery, and RideApp vehicles (i.e., those associated with companies such as Uber and Lyft) by providing: high-speed electric vehicle charging stations at all taxi, livery, and RideApp pools; and taxi and RideApp queue priority to electric vehicles (subject to negotiation with companies).*	Mitigation measures will be implemented when design and construction proceeds.

Source: Massport.

10.10 Runway 27 End Runway Safety Area Improvements Project – EEA #16433

The purpose of the project is to enhance safety for aircraft and their passengers in emergency situations by improving the Runway 27 End RSA. The project would advance an overriding public interest of safety consistent with Title 49 of U.S. Code Section 47101, which states "the safe operation of the Airport and airway system is the highest aviation priority." The project is a required FAA safety project that would not extend the runway or affect normal runway operations, capacity, or types of aircraft using the runway. The location of the project is illustrated in **Figure 10-9**.

Figure 10-9 Runway 27 End Runway Safety Area Improvements Project EEA #16433

Notes: See Table 10-9 for a description of project.
Status as of 12/2022.
Source: Nearmap (November 2022)

An RSA is a flat surface surrounding the runway that is clear of obstructions. The FAA requires Airports to provide RSAs at runway ends and on the sides of a runway to reduce risk of injury and damage to aircraft.

Runway 9-27 is 7,001 feet long and 150 feet wide. It is classified as a Runway Design Code D-V runway. The FAA design standards for a D-V runway require an RSA measuring 1,000 feet long beyond each end of the runway and a width of 500 feet. The Runway 27 End is located on the east end of the runway, and eastern edge of the airfield, adjacent to Boston Harbor. The Runway 27 End RSA is only 150 feet long and does not meet FAA's RSA length requirement of 1,000 feet for a full dimension RSA. The location of the Project is illustrated in **Figure 10-9**. The FAA determined the preferred option to enhance the Runway 27 End RSA is an approximately 650-foot long by 300-foot-wide RSA on pile supported deck with an EMAS installed on the deck.

10.10.1 Permitting History

- Certificate on the ENF issued on October 8, 2021.
- Certificate on the Draft EIR issued on August 29, 2022.
- Certificate on the FEIR issued on January 30, 2023.
- FAA FONSI issued on March 1, 2023.

10.10.2 Project Status

A request for quote (RFQ) and Letter of Interest (LOI) was issued in January 2024, and an RFP will be issued for a design-build entity in Spring 2024. **Table 10-10** lists each of the Section 61 mitigation commitments for the Runway 27 End Runway Safety Area Improvements Project and Massport's progress in achieving these measures.

Table 10-10 Runway 27 End Runway Safety Area Improvements Project (EEA #16433) Details of Ongoing Section 61 Mitigation Measures (as of December 31, 2022)

Mitigation Measure	Status
Land Containing Shellfish	
Contribute funding to Massachusetts Department of Marine Fisheries (DMF) shellfish restoration program.	Mitigation measures will be implemented when design and construction proceeds.
Coastal Wetlands	
Provide in-lieu fee (U.S. Army Corps of Engineers [U.S.ACE]) for impacts to mud flat.	To be determined.
Potential wetland mitigation (associated with piles and emergency egress ramps) based on U.S.ACE and Massachusetts Department of Environmental Protection (MassDEP) guidance.	Mitigation measures will be implemented when design and construction proceeds.
Potential mud flat mitigation in the form of shoreline restoration.	Mitigation measures will be implemented when design and construction proceeds.
State Threatened and Endangered Species	
Replace lost upland grassland habitat by removing existing pavement.	Mitigation measures will be implemented when design and construction proceeds.
Construction Period Mitigation	
In-water time of year restriction for silt producing construction activities of February 15 to June 30.	Mitigation measures will be implemented when design and construction proceeds.
Turbidity curtains will be used to surround the in-water work area to contain any turbidity that may be created by the construction activities.	Mitigation measures will be implemented when design and construction proceeds.
A vibratory pile driver will be used as much as possible, and a ramp up or soft start for hammer driving with padding on top of the pile will lessen noise impacts.	Mitigation measures will be implemented when design and construction proceeds.
Restore upland grassland habitat disturbed by construction.	Mitigation measures will be implemented when design and construction proceeds.

Source: Massport.

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Appendices

The following MEPA appendices are contained within this document in the following pages:

Appendix A	**MEPA Certificates and Responses to Comments**
Appendix B,	**Comment Letters and Responses to Comments**
Appendix C	**Proposed Scope for the 2023 EDR**
Appendix D	**Distribution**

The following appendices include supporting documentation for above listed chapters and are available on Massport's website (https://www.massport.com/environment/project-environmental-filings/boston-logan):

Appendix E	**EJ Supporting Documentation**
Appendix F	**Activity Levels Supporting Documentation**
Appendix G	**Regional Transportation Supporting Documentation**
Appendix H	**Ground Access Supporting Documentation**
Appendix I	**Noise Supporting Documentation**
Appendix J	**Air Quality and Greenhouse Gas Emissions Supporting Documentation**
Appendix K	**Water Quality Supporting Documentation**

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A. MEPA Certificates and Responses to Comments

This Appendix includes the follow Secretary Certificates and Responses to Comments:

- Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the Logan Airport 2020/2021 Environmental Data Report (EDR) and Massport's Responses to Comments Raised in the Certificate A-3
- Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the Logan Airport 2018/2019 Environmental Data Report (EDR) A-71
- Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the Logan Airport 2017 Environmental Status and Planning Report (ESPR) A-83
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate Issued for the Terminal E Modernization Project Environmental Notification Form A-97
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate Issued for the Terminal E Modernization Project Draft Environmental Assessment/Environmental Impact Report A-109
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate Issued for the Terminal E Modernization Project Final Environmental Assessment/Environmental Impact Report A-121
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate Issued for the Logan Airport Parking Project Environmental Notification Form........ A-129
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate Issued for the Logan Airport Parking Project Draft Environmental Impact Report... A-139
- Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate Issued for the Logan Airport Parking Project Final Environmental Impact Report.... A-149

Full versions of filings and additional Secretary Certificates can be found on Massport's website through the following link: https://www.massport.com/environment/project-environmental-filings/boston-logan

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Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the *Logan Airport 2020/2021 Environmental Data Report (EDR)* and Massport's Responses to Comments raised in the Certificate

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The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
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January 30, 2023

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
2020 & 2021 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2020/2021 Environmental Data Report (EDR)
PROJECT MUNICIPALITY	: Boston/Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: December 7, 2022

As Secretary of Executive Office of Energy and Environmental Affairs (EEA), I hereby determine that the Environmental Data Report (EDR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62L) and Section 11.06 of the MEPA regulations (301 CMR 11.00).

Logan Airport Environmental Review and Planning

The environmental review process for Logan Airport (the "Airport"), first established in the 1970s, has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of the Massachusetts Port Authority's (Massport) long-range planning process. The ESPR provides a "big picture" analysis of the environmental impacts associated with current and projected activity levels, and presents a comprehensive strategy to avoid and minimize impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific Environmental Impact Reports (EIRs). The ESPR is generally updated on a five-year basis. The previous ESPR for the year 2017 (2017 ESPR) was filed in August of 2019. The Certificate on the 2017 ESPR was issued on November 25, 2019 and included a Scope for the 2018/2019 Environmental Data Report (EDR) (allowing a combined two-year EDR update).

EDRs are filed in the years between ESPRs. The EDR is a retrospective document that is generally filed annually and identifies environmental impacts based on actual passenger activity and operations. The EDR provides opportunities to compare activity levels and impacts against the prior year's EDR, as well as projections set forth in the five-year ESPR. In the Certificate on the 2018/2019 EDR, the Secretary required a combined 2020/2021 EDR given that 2020 activity levels, if considered in isolation, would not provide a clear and complete indication of post-Covid 19 growth trends. The 2020/2021 EDR responds to the Certificate on the 2018/2019 EDR. This Certificate also contains a proposed Scope for the next ESPR.

Through these EDR and ESPR reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment on cumulative impacts from all aspects of airport operations. This regular updating and reporting on planning and cumulative impacts is unique among Agencies subject to MEPA jurisdiction. It reflects the challenge and complexity of managing and modernizing Logan Airport within a dense, urban area including many Environmental Justice Populations.[1] It recognizes that the proximity of communities to the Airport warrants an enhanced level of public engagement and a concerted, long-term effort to avoid, minimize and mitigate impacts.

As further described below, the data presented in the 2020/2021 EDR appear to show significant recovery in Airport operations as of the end of 2022 (albeit outside the reporting period for this EDR). Accordingly, I am directing Massport, as part of the Scope for the forthcoming 2022 ESPR, to provide a full and accurate report of airport operations in 2022 to confirm whether activity levels, in fact, demonstrate full recovery by the end of 2022, as compared to 2019 or other relevant projections set forth in prior ESPRs. The 2022 ESPR should also demonstrate a clear commitment by Massport to return to prior environmental planning initiated prior to the Covid-19 pandemic. Specifically, Massport should describe a clear decision making process and timetable for implementation of planned capital projects or programs that were deferred from 2018-19 due to pandemic conditions. These include several planned capital projects that would provide environmental benefits and reduce impacts associated with airport operations as activity levels recover, such as: the Logan Airport Parking Project (EEA# 15665) (5,000 new parking spaces, solar photovoltaic system, and electric vehicle charging stations), Phase 2 of Terminal E Modernization (EEA# 15434) (3 new terminal gates), several high-occupancy-vehicle investments (addition of 1,000 new spaces to Framingham Logan Express Garage (EEA# 16168), opening a new Logan Express suburban location, and implementing a 2nd urban Logan Express Service at North Station.

A-1

A-2

[1] [1] "Environmental Justice Population" is defined in M.G.L. c. 30, § 62 under four categories: Minority, Income, English Isolation, and a combined category of Minority and Income.

Comments also request that Massport establish a framework and planning process for A-3
community mitigation, in collaboration with surrounding EJ populations and other community stakeholders. Both the 2017 ESPR Certificate and the 2018/2019 EDR Certificate indicated that Massport should ensure that community benefits are being provided commensurate with
increased growth and associated impacts. The 2018/2019 EDR Certificate also noted Massport's A-4
efforts, in response to a Department of Public Health (DPH) study conducted in 2014, to support public health services in the surrounding neighborhoods, including contributions to Chronic Obstructive Pulmonary Disease (COPD) treatment and the consideration of HEPA filters. In the forthcoming 2022 ESPR, Massport should demonstrate a clear commitment to revisit these prior initiatives and establish a framework and timetable for implementation. In particular, Massport
should clearly communicate to community stakeholders its methodology for determining growth A-5
forecasts and projections, identify potential metrics or thresholds that may trigger the need to
consider additional measures to reduce impacts, and describe efforts to continue contributions to A-6
local public health services in response to more recent research on airport impacts and address emerging issues such as Ultrafine Particles and Black Carbon.

I note that, since review of the 2017 ESPR and 2018/2019 EDR, all new projects in "Designated Geographic Areas" ("DGA," as defined in 301 CMR 11.02, as amended) around EJ populations are subject to new requirements imposed by Chapter 8 of the Acts of 2021: An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy ("Climate Roadmap Act") and amended MEPA regulations at 301 CMR 11.00. Two related MEPA protocols – the MEPA Public Involvement Protocol for Environmental Justice Populations ("MEPA EJ Public Involvement Protocol") and MEPA Interim Protocol for Analysis of Project Impacts on Environmental Justice Populations ("MEPA Interim Protocol for Analysis of EJ Impacts") – are also in effect for new projects filed on or after January 1, 2022. While Massport's ESPR and EDR filings are not formally subject to these new regulations and protocols, I find it appropriate to require the filings to reflect robust community engagement and analysis that meet the spirit of these new regulations and protocols. To that end, I am directing Massport, through the Scope for
the forthcoming 2022 ESPR, to establish a public engagement plan to govern the development of A-7
future ESPRs and EDRs. The plan should ensure that surrounding EJ populations and other community stakeholders have early and meaningful input in the development of the content of these filings, in addition to having the opportunity to provide formal comment once documents are finalized and filed with the MEPA Office. The documents should be prepared in a simpler, user-friendly format that can be digested by a broad sector of the public, so that key details and commitments are not buried in voluminous, data-heavy filings.

Review of the 2020/2021 EDR and Scope for the 2022 ESPR

The 2020/2021 EDR is generally responsive to the Scope. It discusses the effect of the COVID-19 pandemic on activity levels and operations and impacts on future projects and programs. The technical studies in the 2020/2021 EDR include reporting and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air and water quality, environmental management, and project mitigation tracking. The 2020/2021 EDR also describes Massport's "Roadmap to Net Zero" introduced in 2022.

As discussed in the 2018/2019 EDR Certificate, Massport's filings previously indicated a rapid increase in passenger activity levels and aircraft operations during the years 2018 and 2019 due to strong economic conditions at that time. By 2019, air passenger activity levels at Logan Airport had reached an all-time high of 42.5 million, an increase of 3.9 percent over 2018 (40.9 million) and were on track to exceed the 50 million annual passengers projected in the 2017 ESPR much sooner than the previously identified 10-15 year time frame. However, the 2018-2019 EDR also detailed how beginning in March 2020, flights in and out of Logan Airport were dramatically reduced and passenger levels dropped by over 90 percent at the peak of the COVID-19 pandemic in the spring and summer of 2020. It indicated that total flight operations remained reduced by approximately 50 percent, and passenger levels by approximately 70 percent, during the reporting period as compared to January through October 2019.

As anticipated in the Certificate on the 2018/2019 EDR, activity levels at Logan Airport continued their recovery since demand dropped over 98 percent in April of 2020 due to the COVID-19 pandemic. The 2020/2021 EDR indicates that while activity levels are increasing, Logan Airport is recovering at a slower rate when compared to the overall US airport industry which recovered 72.7 percent of its 2019 passenger levels in 2021 while Logan Airport recovered only 53.3 percent. As noted in comments from the Conservation Law Foundation (CLF) and Airport Impact Relief Inc. (Air Inc.), however, more recent passenger activity data from 2022 indicates a much more rapid return to pre-pandemic levels of travel than stated in the EDR. Specifically, passenger data from the months of September, October and November 2022 show recovery up to 92 to 94 percent of levels during the same months of 2019. The 2020/2021 EDR includes a methodology for forecasting future growth which is similar to the method used by the FAA to develop Terminal Area Forecast and indicates that future activity levels are closely tied to the regional and national economy.

As previously noted in comments, the 2020/2021 EDR provides review of a review of airport planning including previously deferred capital projects that were anticipated to provide environmental benefits including installation of a solar photovoltaic system, new electric vehicle charging stations, and several high-occupancy-vehicle (HOV) investments. While some of the highlighted projects remain deferred, the 2020/2021 EDR indicates that ground access and parking remain priority planning interests. Given the indications that activity levels are more rapidly returning to pre-pandemic levels, the 2022 ESPR should indicate a commitment to prioritize mitigation efforts and provide a timeline for deferred projects. A-8

This 2020/2021 EDR discusses topics similar to the 2018/2019 EDR with a focus on the significant changes following the COVID-19 pandemic which has altered the aviation industry. Topics of focus include: (1) changes in activity levels and future forecasting; (2) airport planning including net zero and resiliency planning; (3) changes to ground access and parking; (4) noise abatement strategies; and (5) airport-wide emissions including those associated with vehicle trips.

The 2022 ESPR is an opportunity to update the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts, documented trends, and environmental impacts. The next ESPR will analyze calendar year 2022 and provide projections through 2040. It should follow the general format of the 2017 ESPR and include an Executive Summary and Introduction, similar to previous ESPRs and EDRs. Several comments have noted the complexity and length of the document and difficulty in responding to lengthy, data-heavy A-9

analyses. Massport should consider shortening future filings to put less emphasis on historical A-10
accomplishments and only report on relevant updates, changes, and achievements, noting that
historical data may be necessary for context. As indicated above, Massport should clarify A-11
methodologies and metrics related to growth projections and associated impacts and mitigation,
so that future filings can focus on the most relevant data for assessing Massport's efforts to
minimize impacts from Airport operations.

The 2022 ESPR must include information on the environmental policies and planning A-12
that form the context of environmental reporting, technical studies, and environmental mitigation
initiatives against which projects at Logan Airport can be evaluated. This should include
identification of the cumulative effects of Logan Airport operations and activities, compared to
previous years, as appropriate. The 2022 ESPR should include updated timelines for A-13
implementation of deferred mitigation projects to ensure that mitigation efforts keep up with
increasing rates of travel as pandemic restrictions ease and travel resumes.

The ESPR must include copies of all ESPR and EDR Certificates and a distribution list A-14
for the 2022 ESPR. Supporting technical appendices should be provided as necessary.

Environmental Justice

Logan Airport is within two Environmental Justice (EJ) populations designated as Minority and is within one mile of two EJ populations characterized as Minority. Within the census tracts containing the above EJ populations, within one mile of the project site, the following languages are identified as those spoken by 5% of more of residents who also identify as not speaking English very well: Spanish and Spanish Creole. As indicated, while Massport's EDRs and ESPRs are not formally subject to MEPA EJ regulations and protocols, Massport acknowledges the proximity of the Airport to numerous EJ populations and has indicated a
willingness to expand outreach efforts to meet the spirt of recently revised MEPA protocols. The A-15
2022 ESPR should identify EJ populations with 5 miles of the airport including languages spoken by those who identify as not speaking English very well. These communities should be included in future outreach efforts with project summaries and announcements translated into the identified languages. Since 2013, Massport has also been advised by the Massachusetts Port Authority Community Advisory Committee (MCAC) (see St. 2013, c. 46, §§ 55, 82, as amended), which consists of representatives from 35 communities potentially impacted from Airport operations and located within 5 or more miles around the Airport.

The 2022 ESPR should include a public engagement plan developed consistent with the A-16
MEPA EJ Public Involvement Protocol and review Massport's public outreach efforts prior to
the filing of the ESPR. The public engagement plan should reflect strategies to provide
opportunities for early and meaningful input on the development of Massport's filings, and
should reflect community-based strategies beyond formal public hearings. I encourage Massport
to provide a conceptual draft of the 2022 ESPR and to a hold public information session, held at A-17
accessible location and convenient time (such as the evening or weekend) so as to maximize
input and participation from EJ neighborhoods and residents before the document is finalized.
Massport should consult with the MEPA Office and EEA EJ Office in the development of the A-18
public engagement plan, and involve these offices in community meetings to the extent

appropriate. The final 2022 ESPR, together with a fact sheet translated into relevant languages, should be circulated to community-based organizations (CBOs) and tribes/indigenous organizations ("EJ Reference List") provided by the MEPA Office, with as much advance notice as practicable so as to facilitate a meaningful review of surrounding EJ populations. I encourage Massport to allow for an extended comment period on the ESPR to allow for full public input and participation. Consistent with prior practice, the Executive Summary for the 2022 ESPR should be translated into Spanish and any other languages identified with input from the EEA EJ Director as representing languages spoken by a significant percentage of Limited English Proficiency (LEP) residents within the 35 communities represented by the MCAC. The identified languages should be used when distributing notice of public meetings and other relevant materials. A-19 A-20 A-21

The 2022 ESPR should contain a section on Environmental Justice and discuss public outreach activities conducted pursuant to Massport's public engagement plan. The ESPR should report on discussions with stakeholders regarding methodologies for growth projections, relevant metrics for assessing Airport impacts, and a framework for community mitigation in consideration of growth trends and associated impacts, as well as emerging research and science around public health impacts of airport operations in the U.S. Northeast and other regions. The ESPR should reflect a clear commitment by Massport to return to prior environmental commitments, including contributions to local public health services, that were begun prior to the Covid-19 pandemic. A-22 A-23 A-24

Activity Levels

Air traffic activity levels at Logan Airport are the basis for the evaluation of noise, air quality, and ground access conditions associated with the Airport. In this section, current activity levels at the Airport are compared to prior-year levels, and historical passenger and operations trends at Logan Airport dating back to 2000, which is the year Massport approved an Environmental Management Policy.

In 2017, air passenger activity levels at Logan Airport reached 38.4 million, an increase of 5.9 percent from 2016. At the time of the 2017 ESPR filing, it was projected that Logan Airport would reach 50 million annual passengers in the next 10 to 15 years (the Future Planning Horizon). As noted above, the 2019 passenger activity level represented a high for Logan Airport, which had been averaging an annual passenger growth of 5.9 percent since 2013 and continued to outpace the overall U.S. passenger growth of 4.1 percent for the same time period. The 2020/2021 EDR reports that due to the COVID-19 pandemic, 2020 passenger levels and operations have dramatically decreased with 2021 passenger levels showing a gradual return to 2019 levels with the rate of recovery being slower when compared to overall U.S. scheduled passenger recovery.

Domestic air passengers represent Logan Airport's largest market segment, accounting for approximately 85 and 88.4 percent of total air passengers in 2020 and 2021, respectively. The total number of scheduled domestic flights at Logan Airport in 2021 recovered to 62.8 percent of 2019 levels, or 211,549 operations, after falling 50.6 percent the previous year to 166,410. The 2020/2021 EDR attributes the high proportion of domestic activity (previously 81.2 and 80.2

percent of total air passengers in 2018 and 2019) to the strong demand for leisure travel following the lifting of pandemic related restrictions and a slower rebound of international activity as countries began to re-open their borders to visitors at the end of 2020 into 2021.

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

The total number of aircraft operations at Logan Airport declined by 51.6 percent, from 427,176 operations in 2019, which was a historic peak since 2001, to 206,702 operations in 2020. Operations then increased in 2021 compared to 2020 to 266,034 operations representing a recovery of 62.3 percent of 2019 levels. Despite operational and passenger decreases, dedicated all-cargo operations saw operational growth as compared to 2019, increasing by 10.9 and 2.6 percent in 2020 and 2021, respectively. This continued growth resulted in the dedicated all-cargo segment exceeding 2019 levels by 13.8 percent by end of 2021. The 2020/2021 EDR states that air cargo volumes have been more resilient to pandemic-related effects than passenger traffic. Total cargo volumes (which includes "belly" cargo carried in the belly of passenger aircraft) declined by 16.3 percent in 2020 but increased to 649 million pounds in 2020, which represents a 90.5 percent recovery of 2019 volumes (717 million pounds).

The 2020/2021 EDR also notes a decline in the long-term trend toward greater efficiency, where the number of passengers per aircraft reached a peak of 99.5 passengers per flight in 2019, average number of passengers per flight fell in 2020 to 61.0 passengers per flight, a 38.5 percent decrease. This is a change in trends noted in the 2018/2019 EDR, which indicated a further increase in operational efficiency and "aircraft load factors." International services, which are typically operated by larger widebody aircraft with over 200 seats, were suspended, lowering the average available seat capacity, along with greater use of smaller regional jet (RJ) aircraft on domestic segments. The increase in average passengers per operation prior to the pandemic was attributed to the introduction of newer and larger aircraft at Logan Airport like the Airbus 350 and Boeing 787, in addition to flights operated by Boeing 777 and Airbus A380 superjumbo jets, especially for international long-haul flights. As the domestic demand recovered and international services began to be restored in 2021, the average passengers per operation increased to 85.2 by the end of 2021, or 85.6 percent of 2019 levels.

The 2020/2021 EDR also provides data for the first eight months of 2022 (January to August) which show that operations are down approximately 13 percent and passengers were down approximately 18 percent compared to the first eight months of 2019. As indicated in comments, however, more recent month-to-month data from September through November 20222 appear to show a more rapid return to pre-pandemic passenger levels of travel, when compared to the same months from 2019, than reported in the 2020/2021 EDR. The 2022 ESPR A-25 should continue to report passenger and activity levels and consider planning/mitigation commensurate with this more rapid growth; in particular, air, noise, and traffic reduction measures should be a significant emphasis of the 2022 ESPR. The 2022 ESPR should indicate a clear commitment to implementing deferred capital projects to ensure that these measures are taken to reduce impacts commensurate with activity levels as the economy recovers and the demand for air travel returns to the rate of growth seen before the pandemic. As noted, Massport should engage with stakeholders as it determines methodologies for measuring growth trends and appropriate mitigation planning. A-25 *cont.* A-26

The 2022 ESPR should report on: A-27

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Domestic and international passenger activity levels;
- Cargo and mail volumes;
- Comparison of 2022 aircraft operations, cargo/mail operations, and passenger activity levels to 2019 and 2020-21 activity levels; and
- Report on national aviation trends in 2022, the effect of the pandemic, and compare to trends at Logan Airport.

The 2022 ESPR should update the Logan Airport long-term passenger forecast to reflect growth trends at Logan Airport and revised expectations for the local/national/international economy including current recovery from the COVID-19 pandemic. Planning and impact sections will be based on forecasting for the next five years (2023-2027). It should address methodologies and assumptions used in the analysis, including anticipated changes to fleet mix changes and other trends in the aviation industry. It should also provide: A-28 A-29

- Updated forecasts for passenger volume, aircraft operations, and fleet mix;
- A comparison of 2022 operations to historic trends and 5-year and 2040 forecasts; and
- A comparison of forecast activity levels to Massport forecasts from previous ESPRs, FAA forecasts and the U.S. aviation industry.

As indicated above, Massport should establish a public engagement plan to engage with the MCAC and other stakeholders as it develops a methodology for future growth projections. The 2022 ESPR should report on the results of this consultation and provide a clear, easily digestible description of methodology that will be understood by a broad sector of the public. This methodology should be carried forth in annual EDRs during the next five-year ESPR reporting period. A-30

Planning

The Airport Planning section describes the status of projects underway or completed at Logan Airport through the fall of 2022. The longer planning period was covered due to the slow recovery following the Covid-19 pandemic and provide a better picture of recovery trends. While the 2020/2021 EDR indicates that the dramatic reduction in revenues and activity during the pandemic period resulted in deferment of many projects, Massport asserts it remains committed to implementing project-related mitigation strategies. Planning projects fall into the following categories: Ground Transportation (including high occupancy vehicle (HOV) improvements and Parking; Terminals; Airside Planning, Service Areas; Airport Buffers and Open Space; and Energy, Sustainability, and Resiliency. The 2020/2021 EDR provided updates on over thirty projects including several transportation planning initiatives. Significant projects are highlighted below.

- *Logan Airport Parking Project*: This project includes the construction of up to 5,000 new commercial parking spaces to reduce trip generation associated with increases in passenger drop-off and pick-up at the airport. The Certificate on the ENF was issued on May 5, 2017 and included a Scope for the Draft Environmental Impact Report (DEIR). The Draft EIR/Environmental Assessment (EA) was published in May 2019. The Final EIR/EA was filed in November 2019 and the Secretary's Certificate was issued on January 30, 2020. The project required an amendment to the Logan Airport Parking Freeze Regulations (310 CMR 7.30). Amendments to the regulations were promulgated in 2017. The project is currently advancing design for the first 2,000 spaces in the parking lot across from Terminal E. Both phases are deferred due to the reduction in passenger activity associated with the pandemic.

- *RideApp (formerly Transportation Network Company (TNC)) Infrastructure and Policy (Airport-wide*): As RideApps have become a popular option for transportation to and from Logan Airport, MassPort has developed strategies to manage RideApp operations and reduce RideApp "deadhead" activity.[2] Massport consolidated RideApp activities on the ground floor of the Central and West Garages beginning in October 2019 and completed in December 2019. Massport implemented reduced ride fees for Shared Rides and authorized a rematch program in 2020. Terminal B RideApp pick-up and drop-off operations from the ground floor of the Central Garage are in the process of being moved to the second floor of the Terminal B Garage. This will provide 60 spaces, including three Americans with Disabilities Act (ADA) accessible and four electric vehicle (EV) spaces. This new location is anticipated to open in November 2022.

- *Logan Express Route and Facility Expansion (Off-Airport):* Massport continues to promote Logan Express ridership, thereby reducing vehicle miles traveled (VMT), congestion, and air quality emissions by shifting riders from other vehicle modes. Investments being considered for Logan Express include improving Back Bay Logan Express service, offering a new urban Logan Express service at North Station, pursuing new suburban Logan Express locations, increasing the frequency of the Braintree service, investing in existing suburban sites, and investing in structured parking at existing sites. In March 2020 many service reductions were implemented due to severely reduced passenger levels. In 2021, several Logan Express service enhancements were restored in response to recovering airport activity levels. Woburn service was reopened and Braintree and Framingham service was increased to half-hourly service. In February 2022, Peabody services was reopened at a new more convenient location at the Northshore Mall. Back Bay service restarted in October 2022. No new or potential locations are identified in the 2020/2021 EDR.

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

- *Terminal E Modernization Project*: This project will accommodate existing and long range forecasted demand for international service. The expansion will add the three gates approved in 1996 (International Gateway West Concourse project, EEA #9791), which were never constructed, and an additional four gates in an extended concourse. A key feature of this project is the first direct pedestrian connection from the MBTA Blue Line Airport Station to the terminal complex at Logan Airport. The building will also be aligned to function as a noise barrier. Initial construction began in 2019 but in June 2020 construction was adjusted in response to the pandemic. Currently, Massport is proceeding with construction of the first four gates that will connect to the existing Terminal E in mid-2023. The remaining three gates and pedestrian connection to the Blue Line Airport Station is currently deferred.

- *Terminal B Airline Optimization Project:* Massport is upgrading its facilities on the Pier B side of Terminal B to meet airlines' needs (primarily reflecting the merger of American Airlines and US Airways) and to provide facilities that improve the passenger traveling experience. Similar improvements have been implemented with the recent renovations and improvements at Terminal B, Pier A. Planned improvements include an enlarged ticketing hall; improved outbound bag area; and expanded bag claim hall, concession areas and holdroom capacity at the gate. Project construction was completed in 2022.

- *Terminal C, Pier B Optimization:* This project will make improvements within the existing footprint of Terminal C, Pier B. Existing passenger areas will be renovated and a second level of less than 5,000 square feet will be added. A jet bridge will be installed at an existing aircraft parking position. Project construction was completed in 2019

- *Terminal C Canopy, Connector, and Roadway Project:* Massport is planning improvements that will enhance Terminal C facilities and provide a post-security connector between Terminals B and C, replace aging roadways serving the terminals, and improve the operation of the Terminal C curb. The enhancements also include replacement of the existing canopy on the Departures Level. Construction of the building enhancements began in fall of 2019. Construction of the replacement canopy was completed in 2021, with a slightly reduced program than originally planned. The Terminal C to B Connector was completed in 2022 and roadways are anticipated to be complete in summer 2023.

- *Terminal A to B Airside Connector:* As part of the Airport-wide effort to enhance terminal connectivity post-security, a secure-side connector between Terminals A and B is under consideration. The airside connector between Terminals A and B is still being considered; however, this project is not currently in the five-year Capital Program.

- *Runway 9-27 RSA Improvement Project*: The FAA has approved the use of an Engineered Materials Arresting System (EMAS) for construction of a runway safety area for aircraft overrun protection. Recommended construction is expected to be similar to a pile-supported deck installed at Runway 33L. Work on the Final Environmental Impact Report (EIR) and National Environmental Policy Act (NEPA) document is underway.

- *Runway 15-33 Rehabilitation Project*: Pavement inspections and sampling indicates that Runway 15R-33L is in need of rehabilitation, which was last performed in 2012. Massport plans to rehabilitate Runway 15R-33L, including pavement at the intersections with Runways 4L-22R and 4R-22L, and intersecting taxiways. The project also includes taxiway pavement geometry modifications at or near Runway 15R-33L in accordance with the latest FAA standards, and the RIM Study and Comprehensive Airfield Geometry Analysis. Associated runway and taxiway lighting, pavement markings, and pavement sensors would be upgraded and/or replaced as part of the project. Massport began design for the proposed Runway 15R-33L rehabilitation in 2022. Pending project review and approval, construction is estimated to start in the spring of 2023.

- *Jet Fuel Storage Addition – North Service Area (NSA)*: Massport proposes to enhance the reliability of jet fuel storage availability and distribution to meet current demand at Logan Airport by installing additional jet fuel storage facilities within the existing storage and distribution system. The proposed location for these additional facilities is the site of an abandoned Massport water pumping station, located on Prescott Street adjacent to the rear of the Economy Garage. Construction of a fifth jet fuel storage tank immediately adjacent to the existing tanks and fuel distribution facilities began in 2022 with an expected 2024 completion date.

- *Relocated Compressed Natural Gas (CNG) Station in the North Cargo Area (NCA)*: Massport continues to examine potential on-Airport parcels for relocation of the existing CNG station. Relocation is not expected to occur before 2023.

- *Piers Park Phase II*: Piers Park Phase II will add 4.2 acres of green space to the existing Piers Park on the East Boston waterfront. The Phase II site is located adjacent to the Phase I site, along Marginal Street. The conceptual design of the Phase II site envisions a fully accessible park with a central lawn area, basketball and volleyball courts, and bicycle and rollerblade tracks. Massport has committed up to $15 million for the design and construction. Elevation of the site is also planned to improve neighborhood resiliency and flood damage protection. A new 1,000-square foot community/sailing center, located on the waterfront, is designed to replace the existing Sailing Center building while providing additional meeting spaces for the community. The concept planning and permitting phase was completed in 2022. Construction for Piers Park II commenced in October 2022 and is scheduled to be complete by the end of 2023.

The 2022 ESPR should continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport must accommodate and guide tenant A-31
development. The 2022 ESPR should describe the status of planning initiatives for the following areas: A-32

- Roadways and Airport Parking;
- Terminal Area;
- Airside Area;
- Service and Cargo Areas;

- Airport Buffers and Landscaping;
- Energy, Sustainability, and Resiliency. A-32 *cont.*

The 2022 ESPR should also indicate the status of long-range planning activities, including the status of public works projects implemented by other agencies within the boundaries of Logan Airport. The ESPR should identify the status and assess effectiveness of ground access changes, including roadway and parking projects, that consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on streets in adjacent neighborhoods. Where key environmental mitigation projects have been deferred, Massport should describe the decision making process and factors that will be used to inform the timing of its implementation. While the Scope for the 2018-2019 EDR required a disclosure of this decision-making, the EDR was not fully responsive as it provided details on the status of multiple projects without a clear framework for determining when deferred projects, particularly those intended to mitigate air emissions impacts of Airport operations, would be implemented. The 2022 ESPR should indicate a clear commitment to return to prior environmental commitments relative to capital projects intended to minimize air emissions impacts, and identify the metrics, monitoring data, or other criteria that will be used to inform when it will be implemented based on future increases in demand for air travel as the economy recovers. A-33 A-34 A-35 A-36

Mitigation

The 2020/2021 EDR provides an update on Massport's mitigation commitments under MEPA for projects at Logan Airport for which an EIR was filed to document that all feasible measures have been taken to avoid or minimize impacts. The 2020/2021 EDR addresses cumulative, Airport-wide impacts and reports on these measures through the end of September 2022. It also updates the status of mitigation commitments for recent projects such as the Terminal E Modernization Project (in progress) and the Logan Airport Parking Project (deferred) as well as projects previously included in the EDRs.

Regional Transportation

The 2020/2021 EDR describes activity levels at New England's regional airports and provides an update on regional planning activities, including long-range transportation efforts. The New England region is anchored by Logan Airport and a system of 10 other commercial service, reliever, and general aviation (GA) airports (regional airports). In 2020 and 2021, the New England region saw a decrease in air passenger activity. Regional air passengers decreased (as compared to the 2019 high of 59.7 million) by 69 percent to 18.52 million air passengers in 2020 and by 43.7 percent to 33.64 million in 2022. In 2020 and 2021, the 10 regional airports accounted for a total of 5.9 and 11.0 million passengers, respectively, compared to 17.2 million passengers in 2019.

The 2022 ESPR should report on: A-37

Regional Airports

- 2022 regional airport operations, passenger activity levels, and schedule data within an historical context;

- Status of plans and new improvements as provided by the regional airport authorities; A-37 *cont.*
- Regional economic factors;
- Role of the Worcester Regional Airport and Hanscom Field in the regional general aviation system and Massport's efforts to promote these airports; and
- Ground access improvements.

Regional Transportation System

- Massport's role in managing the regional transportation aviation facilities;
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership.

Ground Access to and from Logan Airport

The 2020/2021 EDR reports that average daily traffic and VMT on Airport roadways has decreased in 2020 and 2021 compared to 2019 as a result of the pandemic. As reported, fewer passengers and employees were traveling to and from Logan Airport and there was less roadway congestion both in Boston and the metropolitan area. The EDR states that Massport continues to plan for the recovery of air passenger activity and remains committed to implementing the broad range of ground access and trip reduction strategies aimed at increasing the number of passengers arriving by transit or other HOV mode. The 2020/2021 EDR provides a discussion of ground access modes and trip generation associated with each mode including: (1) transit and shared-ride HOV services; (2) drive to Logan Airport and park; or (3) drop-off/pick-up mode, which can involve a private vehicle, taxi, limousine, or RideApp/TNC.[3]

Average weekday on-Airport VMT decreased by about 75 percent from 2019 to 2020 from approximately 209,900 in 2019 to 52,794 in 2020. Between 2020 and 2021, average weekday on-Airport VMT increased to 118,937 (an increase of 79.7 percent over 2020); however, this still represented a decrease of 43.3 percent below 2019 levels. RideApp transactions dropped from over 7 million in 2019[4] to just 2 million in 2020 and 3 million in 2021. Similarly, the number of black car limousines and scheduled van seats dropped by nearly 64 percent from 2019 to 2021. Taxi dispatches declined 80 percent in 2020 compared to 2019 and increased by 66 percent between 2020 and 2021. MBTA Blue Line ridership decreased by approximately 36 percent between 2019 and 2020 but increased 31 percent in 2021 compared to 2020. Logan Express ridership from suburban park-and-ride locations decreased by 70 percent between 2019 and 2020 and increased by 18 percent between 2020 and 2021. Massport indicates results of the 2022 Air Passenger Ground-Access Survey will be presented in the 2022 ESPR to provide post pandemic trends related to HOV mode share.

The 2020/2021 EDR reports on the effectiveness of the RideApp management plan and provides an update on planned and executed measures to relieve on-Airport roadway congestion including updates on the Logan Airport Parking Project. Massport describes policies that Massport has implemented to manage the RideApp operations and status of each, noting that reduced fees are currently offered for shared rides. In addition, Terminal B RideApp pick-up and

[3] Transportation Network Companies (TNCs) are now referred to as RideApp companies (e.g., Uber and Lyft).
[4] The Certificate on the 2018/2019 EDR indicated RideApp activity was 8 million in 2019.

drop-off operations are in the process of being moved from the ground floor of the Central Garage to the second floor of the Terminal B Garage. This will provide 60 spaces, including three Americans with Disabilities Act (ADA) accessible and four electric vehicle (EV) spaces. This new location is anticipated to open in November 2022. Massport is continuing to promote Logan Express ridership by expanding parking, frequency, and facility upgrades reducing vehicle miles traveled (VMT), congestion, and air quality emissions.

Post-pandemic, Logan Airport is expected to continue to be one of the top U.S. airports in terms of high-occupancy vehicle (HOV) and transit mode share. The 2020/2021 EDR states Massport has a goal of reaching 35.5 percent HOV mode share by 2022 and 40 percent by 2027. Based on the results of the 2019 Logan International Airport Air Passenger Ground-Access Survey, HOV mode share reached 40.4 percent, exceeding both near-term and longer-term goals; however, COVID-19 had a range of impacts on ground transportation, particularly on the use of ground-access HOV modes. Comments note that it is unclear whether Massport remains compliant with HOV goals, as a result of pandemic conditions. In 2020 goals to improve HOV mode share included adding 1,000 parking spaces to the Framingham Logan Express service and adding a new urban Logan Express Location. Both projects have been deferred until ridership increases. The 2020/2021 EDR reports that after a temporary suspension of bus service from Peabody and Woburn (Braintree and Framing continued to operate on reduced schedules), suburban Logan Express services have been restored and the Peabody service was relocated (February of 2022). New initiatives to increase urban Logan Express ridership included a pilot security line status for riders (suspended in 2020 but resumed in October 2022) and implementation of electronic ticketing (October 2022). The 2020/2021 EDR indicates there is no pre-pandemic information on Silverline boarding data but the number of passengers increased by 30 percent between 2020 and 2021. As noted above, Massport will purchase eight new Silver Line buses as part of a forthcoming (Spring 2023) MBTA procurement.

The 2022 ESPR should report on 2022 ground access conditions at the airport and provide a comparison to 2019, 2020, and 2021 for the following: A-38

- Description of compliance with Logan Airport Parking Freeze;
- HOV ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express) and description of compliance with HOV goals and explanation of methodology for determining compliance;
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport VMT;
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning and the connection to the MBTA Airport Station associated with the planned Terminal E Modernization;
- Results of the 2022 Logan Airport Air Passenger Ground-Access Survey; and,
- Status of proposed connector to the Airport Station associated with the planned Terminal E Modernization Project.

The chapter should present a discussion of analytical methodologies and assumptions for the planning horizon year (2040)[5] for traffic volumes, on-airport VMT and parking demand. A-39

The 2022 ESPR should address the following topics: A-40

- Target HOV mode share and incentives;
- Impact of RideApps on Logan Airport landside operations and effectiveness of the RideApp management plan;
- Update on parking conditions;
- Non-Airport through-traffic;
- Cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Silver Line, Water Transportation, and Logan Express;
- Report on efforts to increase capacity and use of Logan Express;
- Progress on enhancing water transportation to and from Logan Airport;
- Results and recommendations of the ground access study Long-term Parking Management Plan required by the Parking Freeze amendments; and
- Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.

Noise

The 2020/2021 EDR provides an update on the status of the noise environment at Logan Airport in 2020 and 2021 and describes Massport's efforts to mitigate noise exposure and impacts. As described throughout the EDR, 2020 and 2021 are unusual in comparison to the trends of the preceding decades.

The 2020/21 EDR provides noise modeling results from the AEDT (version 3d). The model requires detailed operational data as inputs for noise calculations, including numbers of operations per day by aircraft type and by time of day, which runway is used for each arrival and for each departure, and flight track geometry for each track. The 2020/2021 EDR also presents summaries of the 2020 and 2021 operational data used in the noise modeling, as well as the resultant annual Day-Night Average Sound Level (DNL) noise contours, a comparison of the modeled results with measured levels from the noise monitoring system, and estimates of the population residing within various increments of noise exposure in 2020 and 2021

Both FAA and the U.S. Department of Housing and Urban Development consider DNL exposure levels above 65 decibels (dB) to be incompatible with residential land use. The 2020/2021 EDR describes how there was an overall decrease in the total number of people residing within the DNL 65 dB contour in 2020 and 2021 due to the significant drop in annual daily operations in those years. Specific changes noted in DNL contours include a greater than expected decrease in the Point Shirley area of Winthrop due to a 2.5 month closure of Runway 27 for construction in 2020, a slight increase in East Boston towards Chelsea due to an increase in use of Runway 15R for arrivals (about 0.5 percent in 2020 and about 4 percent in 2021), and a

[5] The planning horizon in the 2017 ESPR was 2035.

slight increase in 2020 for the lobe that reaches into Revere in 2020 followed by a slight decrease in 2021.

Massport monitors flights that operate during the DNL nighttime period of 10:00 PM to 7:00 AM, when each modeled flight is increased by 10 dB in calculations of noise exposure. Nighttime operations during this period represented 13 percent of total operations for both 2020 and 2021. Nighttime operations decreased from an average of 186 operations in 2019 to approximately 72 per night in 2020 and 92 per night in 2021. This represents total nighttime operations decrease from 2019 to 2020 of 61 percent with 2020 to 2021 rebounding slightly with an increase of 29 percent. The 2020/2021 EDR notes that nighttime cargo operations accounted for approximately 5 percent of all commercial nighttime operations in 2019; that percentage increased to 13 percent for 2020 and was 9 percent for 2021 most likely due to an increased demand for shipping during the pandemic. The majority (about 86 percent in 2020 and 78 percent in 2021) of nighttime operations occurred either before midnight or after 5:00 AM.

The DNL 65 dB contours decreased dramatically in 2020 due to the lower noise levels accompanying the dramatic reduction in airport operations. As noted above, in 2020, the DNL 65 dB contour reaches farther into populated areas of Boston, Winthrop, and Revere than in 2020 but remains smaller than in 2019. The total number of people residing within the DNL 65 dB contour decreased from 8,768 in 2019 to 804 in 2020. The estimated population (based on 2020 U.S. Census data) within the DNL 65 dB contour increased to 2,497 in 2021 but still well below 2019.

The 2018/2019 EDR anticipated that the return of air traffic would be accompanied by a different mix of aircraft types as larger and older aircraft models were retired. Aircraft are categorized according to their noise emissions levels in FAA Advisory Circular 36-1H, *Noise Levels for U.S. Certificated and Foreign Aircraft*, as either Stage 3, Stage 4, or Stage 5 (older State 1 and 2 aircraft have been phased out). The 2020/2021 EDR reports that about 29 percent of 2020 and 2021 operations were conducted in aircraft meeting the requirements for Stage 5 certification, 69 percent meeting Stage 4 certification, and the remaining 2 to 3 percent meeting only Stage 3 certification. The 2020/2021 EDR does not provide this same metric for 2019 as means of comparison.[6] A-41

In 2020, Massport received 240,951 noise complaints from 72 communities, a decrease of about 10 percent from 268,929 noise complaints from 86 communities in 2019. In 2021, as the number of flights rebounded, the number of complaint calls rose to 269,867 from 83 communities. Massport attributes the change to an increase in ability to submit complaints (improvement in phone and online complaint reporting system),[7] an increased public awareness from community groups, and an increase in people working from home.

The 2020/2021 EDR report on the status of Block 1 and 2 of the RNAV Pilot Project, which will analyze the feasibility of changes to some of RNAV approaches and departures from Logan Airport to reduce noise. Recommendations from the study conducted by a technical team

[6] Data is provided by carrier but not as a percentage of total 2019 operations.
[7] Airnoise is a subscription service that allows the user to file a noise complaint by clicking a button. The system finds the aircraft closest to the complainer and then files a detailed noise complaint directly with Massport. https://www.airnoise.io/.

led by MIT, completed recommendations in two phases. Block 1 recommendations were those that would not result in shifting noise from one area to another, and that would not have significant operational/technical implications. A report on Block 1 recommendations was completed in December 2017 and was sent to the FAA in 2020 for review and implementation. In 2021, the FAA completed development of these recommendations and published the procedures in December 2021. Block 2 recommendations were those that could result in noise increases in some areas or face technical barriers that would require further review. The RNAV technical team, led by MIT, completed the Block 2 report in June of 2021; however, after review by FAA and industry stakeholders, it was determined that none of the procedures would be recommended for further evaluation. The RNAV study team worked with FAA on revisions to several of the procedures which were released in December 2021. Two of the procedures, including modifying the existing RNAV Standard Instrument Departure (SID) from Runways 22R and 22L to enable an earlier turn to the east, and adding a new over-water RNAV approach for Runway 22L, were put forth for further study and implementation. In January of 2022, Massport submitted a request to the FAA for review and implementation of these procedures.

The 2020/2021 EDR reports that no new dwelling units received sound insulation from Massport. A total of 5,467 residential buildings and 11,515 dwelling units have been sound insulated since 1986 when the program was first implemented. In December 2021, the FAA approved Massport's updated Residential Sound Insulation Program (RSIP) Noise Exposure Map (NEM) (a requirement to establish eligibility for sound insulation). In 2022, Massport applied for and was approved for an initial grant by the FAA to fund the beginning phase of the RSIP program. The initial grant amount will fund the upfront work related to sound insulation including outreach to eligible homes, application process, pre-testing, and design/bid documents for homes that pass the FAA required pre-testing. Homes that pass the pre-testing will be used as pilots to inform future phases of the program. The 2022 ESPR should contain an update on the initial phase and the progress on additional grant applications to ensure sound insulation is available to qualified residences. A-42

The 2022 ESPR should also provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2022 conditions and provide a comparison to 2020, 2021 and 2019 for the following: A-43 A-44

- Fleet Mix, including Stage 3, and qualifying Stage 4 and Stage 5 aircraft;
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals); and,
- Flight tracks.

The 2022 ESPR should report on the following: A-45

- Changes in annual noise contours and noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed;
- Cumulative Noise Index (CNI);

- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and A-45 *cont.*
- Flight track monitoring noise reports.

The 2022 ESPR should also report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) and report on the status of Block 1 and 2 of the RNAV Pilot Project. A-46

Sustainability at Logan Airport

The 2020/2219 EDR describes Massport's airport wide sustainability goals as identified in its International Organization for Standardization (ISO) 14001 Environmental Management System (EMS) and Sustainability Management Plan (SMP). The Logan Airport SMP (2015) is integrated with the existing EMS framework to promote environmental, social, and economic improvement. The next SMP is anticipated to be released in 2022. Annual Sustainability and Resiliency Reports have been published since 2016 but were suspended for 2020 and 2021. Massport indicated that sustainability project information could be found in its Annual Sustainable Massport Calendars[8] and within the 2021 EDR as indicated by a leaf icon on individual pages; however, the reported efforts had generally been completed prior to 2020. The 2020/2021 EDR did report on the preparation in 2021 and release in March of 2022 of Massport's *Roadmap to Net Zero by 2031*.[9] The nine page document on the Massport Website presents a high-level overview of how Massport will achieve net zero including improving energy efficiency, investing in electric vehicles, and finding ways to transition to renewable energy including onsite generation. The 2020/2021 EDR reports that the upcoming 2022 SMP will outline performance throughout the global pandemic (2020 and 2021) and will also serve to close out the performance targets of the 2015 SMP. The 2022 ESPR should provide a summary of 2022 and future goals. A-47

Climate Change

Massport assets and Logan Airport, in particular, are critical infrastructure and play an important role in the economy. Governor Baker's Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth was issued on September 16, 2016. The Order recognizes the serious threat presented by climate change and direct Executive Branch agencies to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for its impacts. The urgent need to address climate change was again recognized by Governor Baker and the Massachusetts Legislature with the recent passage of St. 2021, c. 8, An Act Creating a Next Generation Roadmap for Massachusetts Climate Policy, which sets a goal of Net Zero emissions by 2050. I note that the MEPA statute directs all Agencies to consider reasonably foreseeable climate change impacts, including additional greenhouse gas emissions, and effects, such as predicted sea level rise, when issuing permits, licenses and other administrative approvals and decisions.

The 2020/2021 EDR acknowledges the MEPA Interim Protocol on *Climate Change and Resiliency*, effective for all new filings as of October 1, 2021, and states that all new projects at

[8] https://www.massport.com/massport/business/capital-improvements/sustainability/sustainability-management/
[9] https://www.massport.com/massport/about-massport/roadmap-to-net-zero/

Logan Airport that are filed with MEPA will comply with the amended regulation and protocols. The 2022 ESPR should report on all climate resiliency measures planned or implemented/constructed. A-48

Adaptation and Resiliency

A particular concern for Massport is the effect of sea level rise and projected increases in the severity and frequency of storms. The 2020/2021 EDR reviews planning efforts initiated by Massport beginning in 2013 with the Disaster and Infrastructure Resiliency Planning (DIRP) Study for Logan Airport, the Port of Boston, and Massport's waterfront assets in South and East Boston. It includes a hazard analysis; modeling of projected sea-level rise and storm surge; temperature and precipitation projections; and anticipated increases in extreme weather events.

In addition to the DIRP Study and its related initiatives, Massport issued a *Floodproofing Design Guide* and developed a resilience framework to provide consistent metrics for short- and long-term planning and protection of its critical facilities and infrastructure. Massport's *Floodproofing Design Guide* was updated in November 2018. Plans were also introduced in 2015 that included the deployment of temporary flood barriers to protect up to 12 locations of critical infrastructure in the event of severe weather. The 2020/2021 EDR indicates that additional locations have been permanently enhanced to prevent flooding.

The 2022 ESPR should report on the status of projects undertaken to prevent impacts from future climate change including reporting on specific projects implemented to protect against sea-level rise. It should report on planning initiatives to improve resiliency including any updates to the DIRP. A-49

GHG emissions

The 2020/2021 EDR incorporates GHG emissions reporting consistent with that provided in the 2017 ESPR but with a change in methodology. In prior years, GHG emissions were quantified using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (Airport Cooperative Research Program (ACRP) Report 11, Project 02-06). The 2020/2021 GHG reporting utilizes additional guidance from the Airports Council International (ACI) and the Airports Carbon Accreditation Program (ACA) which separates emissions based on ownership/control: Scope 1/Direct – emissions that are controlled by Massport; Scope 2/Indirect - emissions associated with the generation of electricity consumed but generated off-site at public utilities; Scope 3/Indirect and Optional – GHG emissions that are associated with the activities of the reporting entity (Massport), but are associated with sources that are owned and controlled by others (aircraft-related emissions, tenant activities, and ground transportation). The 2020/2021 EDR quantifies and reports GHG emissions for all three scopes which, in total, are consistent and comparable to prior EDRs. The 2020/2021 EDR provides comparisons to data from 1990 and 2000 and then annually for 2010 to 2019, noting that 2020 and 2021 were influenced by the pandemic and were not representative. The analysis showed that total GHG emissions in 2020 decreased by about 60 percent and in 2021 decreased by 51 percent from 2019 levels. This reduction in GHGs is attributed to the COVID pandemic as flights in and out of Logan Airport were dramatically reduced and passenger levels significantly dropped.

Massport reports on initiatives to reduce emissions and highlights the Alternative Fuel
Vehicles (AFV) Program which is designed to replace Massport's conventionally fueled fleet
with alternatively fueled or powered vehicles and reports on new charging infrastructure
including a 2020 grant for charging infrastructure at Terminal E and other locations. Massport
has also made a commitment to purchase eight new MBTA Silver Line buses (spring 2023). The A-50
Certificate on the 2018/2019 EDR requested that Massport consider comments from the
Department of Energy Resources (DOER) which recommend electrification of space and water
heating, as well as evaluation of opportunities for distributed renewable energy generation.
DOER comments on the 2020/2021 EDR reiterate these recommendations, which should be
addressed in the 2022 ESPR. Massport indicates that with the recent release of its Net Zero
Roadmap, implementation efforts are underway and future EDR/ESPR filing will provide an
update on progress. While Massport's Net Zero efforts should be commended, I note that these
relate only to emissions that are under Massport's control (Scope 1 and portions of Scope 2). The A-51
2022 ESPR should continue to report on all initiatives to reduce GHG emissions from all Airport
sources, including deferred capital projects intended to reduce mobile source GHG emissions
from ground transportation to and from the Airport. To the extent feasible, Scope 3 emissions
should distinguish aircraft and ground transportation sources as separate sub-categories of
emissions.

For the 2022 ESPR, Massport proposes to continue GHG reporting to better align with
international airport GHG reporting protocols and indicates the 2022 ESPR will describe these
refinements. The 2022 ESPR should continue to be quantified for aircraft, GSE, motor vehicles, A-52
and stationary sources using emission factors and methodologies outlined in the Greenhouse Gas
Emissions Policy and Protocol issued by EEA, the Transportation Research Board's Guidebook
on Preparing Airport Greenhouse Gas Emissions Inventories, and the ACRP and ACA. The A-53
results of the 2022 GHG emissions inventory should be compared to the 2019, 2020 and 2021
results as the EDR indicates that 2020 and 2021 are not representative. The ESPR should also A-54
provide projections for GHG emissions over the next five years and through 2040, based on the
projected activity levels surveyed as indicated above. The ESPR should compare these
projections to historical levels as set forth in prior ESPRs. The ESPR should describe all efforts A-55
by Massport to reduce GHG emissions during 2022 and the years since the last ESPR, and
should quantify reductions associated with those initiatives to the extent feasible. To the extent
efforts were deferred, the ESPR should clearly track the anticipated emissions benefits associated
with such initiatives, and ensure that those reductions are not credited in the future projections
provided for the relevant reporting period. The ESPR should provide a status update that reports A-56
on progress made towards achieving Massport's Net Zero goal for emissions under its control.

Air Quality/Emissions Reduction

The 2020/2021 EDR provides an overview of airport-related air quality issues in 2020 and 2021 and the efforts to reduce emissions. The air quality modeling is based on aircraft operations, fleet mix characteristics, and airfield taxiing times combined with GSE usage, motor vehicle traffic volumes, and stationary source utilization rates. The 2020/2021 EDR uses FAA's approved computer model for calculating emissions from aircraft-related sources, the Aviation Environmental Design Tool (AEDT) (model v. AEDT 3d). Total air quality emissions from all sources associated with Logan Airport are significantly lower than a decade ago and have decreased from 2019 due to decreases in airport operations. The 2020/2021 EDR identifies Massport's initiatives to improve air quality and reduce emissions, including: replacement of gas- and diesel-powered GSE with all-electric GSE (eGSE) by the end of 2027 (as commercially available); implementation of additional initiatives to increase HOV use, investments in renewable energy installation on-airport including solar and wind, use of clean-fuel shuttle buses, and implementation of Massport's net Zero Roadmap by 2031 initiatives.

Massport prepared emissions inventories for 2020 and 2021 for the criteria pollutants carbon monoxide (CO), particulate matter (PM10/PM2.5), volatile organic compounds (VOCs), and oxides of nitrogen (NOx). Total modeled emissions of volatile organic compounds (VOCs), oxides of nitrogen (NOX), carbon monoxide (CO), and particulate matter (PM10/PM2.5) decreased from 2019 to 2020 by about 58 percent, 54 percent, 59 percent, and 47 percent, respectively. The 2021 total modeled emissions of VOC, NOX, CO, and PM10/PM2.5 decreased by about 45 percent, 42 percent, 48 percent, and 23 percent, respectively, from 2019 levels. These decreases are primarily attributable to the decrease in passenger activity levels and aircraft operations due to the COVID pandemic. Modeled emissions of VOCs, NOX, CO, and PM10/PM2.5 associated with aircraft decreased from 2019 to 2020 due to the COVID pandemic, by approximately 59 percent, 54 percent, 58 percent, and 53 percent, respectively. While there are model version differences (between AEDT v.3c and v3d) between 2019 and 2020, causing variances in emissions between those years, overall aircraft emissions decreased from 2019 to 2020 for all pollutants predominantly due to the decrease in passenger air travel demand, and thus fewer operations. Modeled emissions of VOCs, NOX, CO, and PM10/PM2.5 associated with aircraft decreased from 2019 to 2021 by approximately 48 percent, 42 percent, 49 percent, and 44 percent, respectively. Modeled emissions of VOCs, NOX, CO, and PM10/PM2.5 associated with GSE declined from 2019 to 2020 by approximately 40 percent, 48 percent, 36 percent, and 50 percent, respectively. From 2019 to 2021, GSE-related emissions of VOCs, NOX, CO, and PM10/PM2.5 decreased by approximately 22 percent, 39 percent, 20 percent, and 39 percent, respectively, due to the decrease in aircraft operations in the two years, which in turn required reduced use of GSE and aircraft auxiliary power units (APUs).

At the time that emission estimates were prepared for the 2020/2021 EDR, MOVES Version 3.0.3 was the EPA's latest approved computer model for estimating emissions from mobile sources (i.e., on-road motor vehicles and most nonroad equipment). The 2018/2019 EDR was prepared using the MOVES214b version. According to the EPA release notes, the differences in the two database servers, as well as the updates to the vehicle population, travel activities, and emission rates, results in higher PM10/PM2.5 outputs in MOVES3.0.3 than MOVES2014b. The EDR indicates that Moves 3.03 modeled emissions of VOCs, NOX, CO, and PM10/PM2.5 associated with motor vehicles, many of which Massport has influence on, have declined from 2019 to 2020 by approximately 76 percent, 93 percent, 79 percent, and 27 percent, respectively. Notably, the small decrease in PM10/PM2.5 emissions from 2019 to 2020, despite the substantial reduction in passenger activity levels, is mainly due to the model variances used between the two analysis years. From 2019 to 2021, emissions of VOCs, NOX, and CO decreased by approximately 50 percent, 84 percent, and 57 percent, respectively. On the other hand, PM10/PM2.5 emissions increased by approximately 57 percent. Massport notes that this is mainly due to the model variances between the two different model versions of MOVES.

The 2022 ESPR should continue to provide an overview of the environmental regulatory A-57
framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air
quality modeling. The 2022 ESPR should also provide discussion of progress on national and
international levels to decrease air emissions. Massport should continue to use the latest version A-58
of FAA's AEDT model for air emissions modeling as was presented in the 2020/2021 EDR. The
EPA Motor Vehicle Emission Simulator (MOVES) tool should continue to be used to assess
vehicular emissions on airport roadways. The 2022 ESPR should include a mobile sources A-59
emissions inventory for CO, NOx, VOCs, and PMs. It should also report on Massport and tenant
alternative fuel vehicle programs and the status of Logan Airport air quality studies undertaken
by Massport or others, as available. The 2022 ESPR should demonstrate that Massport's A-60
programs to maintain and increase HOV modes provide the capacity to meet demand associated
with growth as passenger activity levels and airport operations fully recover from the COVID-19
pandemic. The ESPR should quantify the emissions reductions associated with Massport's air A-61
emissions/GHG reduction initiatives to the extent feasible. Future filings should include data on A-62
Diesel PM to the extent such data are available.

The 2020/2021 EDR provides updated information on Ultrafine Particles (UFPs) which is particulate matter (PMs) subdivided into categories based on their diameters. UFPs have diameters less than 0.1 micrometers (µm). In December of 2020, the Environmental Protection Agency (EPA) published a final action in the Federal Register detailing the agency's review of the National Atmospheric Air Quality Standards (NAAQS) for PM10/PM2.5. UFP is addressed in the supplemental information of the notice. In their review of the PM10/PM2.5 NAAQS, EPA determined that due to significant uncertainties and limitations, as well as the limited availability of air monitoring data, that the PM2.5 NAAQS would be retained as the indicator for UFP. Studies conducted at Zurich Airport in Switzerland and London Heathrow Airport in England have demonstrated that UFP dispersion is highly dependent on wind speed and direction with UFP particle counts being on the order of 10 times higher when measured downwind of the
airports. The 2020/2021 EDR indicates that Massport is cooperating with Boston University and A-63
Tufts University in identifying aircraft specific related UFPs in an urban environment with non-airport related sources. This research is ongoing in the East Boston area and Massport continues to contribute by providing Logan Airport operational and other pertinent data. The 2022 ESPR should provide a more detailed update on the study and how findings may relate to Massport operations and a potential framework for community mitigation.

The 2020/2021 EDR summarized other recent studies on impacts of aviation emissions on air quality and public health including a project between Olin College, Air Inc., and the Town of Winthrop to continuously measure pollutants such as CO, CO_2, nitric oxide (NO), NO_2, and O_3. as well as the mass concentration of PM2.5/10, and relevant meteorological conditions. This study is ongoing and Massport will continue to provide operational data and collaborate as
needed. As requested in the Certificate on the 2018/2019 EDR, Massport has indicated that it has A-64
renewed an agreement to provide funding to the East Boston Neighborhood Health Center to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including

screenings for children, distribution of asthma kits, and home visits, among others. The 2022 ESPR should include updates on the status of these collaboration efforts. The 2022 ESPR should continue to report on engagement with the Health Center and include a discussion of how the services provided directly to and through the Health Center (which are funded by Massport) can be expanded. As indicated above, Massport should consult with community-based organizations about potential approaches to further mitigate air quality impacts in light of growth trends and emerging research on the impacts of airport operations on public health. The ESPR should describe a decision making process that Massport intends to follow to determine what, if any, additional public health contributions would be considered, and how Massport would seek to fund such contributions. The ESPR should clearly describe the research efforts that Massport will fund or collaborate on, and how such efforts will be identified.

A-64 *cont.*

A-65

A-66

Water Quality/Environmental Compliance

The 2020/2021 EDR describes Massport's ongoing environmental management activities including National Pollutant Discharge Elimination System (NPDES) compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management. Massport's primary water quality goal is to prevent or minimize pollutant discharges, to limit adverse water quality impacts of airport activities. Massport employs several programs to promote awareness of activities that may impact surface and groundwater quality. Programs include implementing best management practices (BMPs) for pollution prevention by Massport, its tenants, and its construction contractors; training of staff and tenants; and a comprehensive stormwater pollution prevention plan. The 2020/2021 EDR reports that in 2020, 100 percent of stormwater samples complied with standards for pH, oil and grease, and TSS. In 2021, 99 percent of stormwater samples complied with standards for pH, oil and grease, and TSS. Massport notes that given the large size of the drainage areas and low concentrations of pollutants, it is not always possible to trace exceedances to specific events.

The 2022 ESPR should identify any planned stormwater management improvements and report on the status of: A-67

- NPDES Permit and monitoring results for Logan outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- MCP activities;
- Tank management;
- Update on the environmental management plan; and
- Fuel spill prevention.

Response to Comments

The 2020/2021 EDR was noticed in the Environmental Monitor on December 7, 2022, with a 30-day public comment period and was subsequently extended by Massport to a 60-day comment period ending on January 23, 2023. A hybrid public presentation of the EDR was held on December 15, 2023 at the Rental Car Center at Logan Airport with remote meeting access available for those who could not attend in person.

The Response to Comments section should address all of the substantive comments on A-68
the 2020/2021 EDR, and other Certificates for Logan Airport that reference EDR/ESPR
documentation (e.g. Logan Airport Parking Project (EEA# 15665), Terminal E Modernization
(EEA# 15434)). To ensure that the issues raised by commenters are addressed, the 2022 ESPR A-69
should include direct responses to comments to the extent that they are within MEPA
jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of
the 2022 ESPR beyond what has been expressly identified in this Certificate. The Response to
Comments should not reference a section of the 2022 ESPR unless they are directly responsive
to the comment. Common themes that should be addressed throughout the 2022 ESPR and in the A-70
Responses to Comments include mitigation for air quality impacts (and the findings and
relevance of UFP research being performed by Tufts University and Boston University), noise
abatement, and traffic reduction measures. The ESPR should also include information to clarify A-71
and refine its process for estimating growth rates and provide more detailed data on the
implementation of deferred mitigation projects aimed at addressing impacts. The 2022 ESPR
should consider alternative methods of presenting and explaining data and findings that are
accessible and understandable to all readers.

Conclusion

Massport may prepare a 2022 ESPR for submission consistent with the Scope included in
this Certificate. I encourage Massport to target early 2024 for filing of the 2022 ESPR. A-72

January 30, 2023
Date

Rebecca L. Tepper

Comments received:

12/16/2022 Friends of the Mary Ellen Welch Greenway
01/23/2023 Massport Community Action Advisory Committee (MCAC)
01/23/2023 Airport Impact Relief, Inc. (Air Inc)
01/26/2023 Department of Energy Resources (DOER)

RLT/JAH/jah

#	Author	Topic	Comment	Response
A-1	EEA Secretary Certificate	Activity Levels	I am directing Massport, as part of the Scope for the forthcoming 2022 ESPR, to provide a full and accurate report of airport operations in 2022 to confirm whether activity levels, in fact, demonstrate full recovery by the end of 2022, as compared to 2019 or other relevant projections set forth in prior ESPRs.	As directed by the Secretary, this 2022 ESPR provides a full description of passenger activity levels and aircraft operations. Logan Airport served 36.1 million passengers in 2022, which was roughly equivalent to its 2016 passenger count. Logan Airport's 2022 passenger activity levels were still about 15 percent below 2019 levels. In 2022, Logan Airport handled 378,613 aircraft operations, which is 11.4 percent less than the 427,176 aircraft operations seen in 2019. Chapter 3, *Activity Levels and Forecasting*, Table 3-1, summarizes the 2022 activity levels. The number of passengers per aircraft in 2022 was, on average, 132 passengers per aircraft operation. This is comparable to the 2019 average of 130 passengers per aircraft operation.
A-2	EEA Secretary Certificate	Airport Planning	Demonstrate a clear commitment by Massport to return to prior environmental planning initiated prior to the COVID-19 pandemic. Describe a clear decision-making process and timetable for implementation of planned capital projects or programs that were deferred from 2018-19 due to pandemic conditions. These include several planned capital projects that would provide environmental benefits and reduce impacts associated with airport operations as activity levels recover, such as: the Logan Airport Parking Project (EEA# 15665) (5,000 new parking spaces, solar photovoltaic system, and electric vehicle charging stations), Phase 2 of Terminal E Modernization (EEA# 15434) (3 new terminal gates), several high occupancy vehicle investments (addition of 1,000 new spaces to Framingham Logan Express Garage) (EEA# 16168), opening a new Logan Express suburban location, and implementing a 2nd urban Logan Express Service at North Station.	As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, and projects are prioritized based on passenger needs and user demand. Updates on projects deferred due to COVID-19 are discussed in Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 and are summarized as follows: • Postponed Terminal E Improvement Phases 1 and 2: Terminal E Phase 1 opened in October 2023, and the next phase to add four new gates is currently in conceptual planning process. • Postponed Parking Garage in front of Terminal E: Permitted for up to an additional 5,000 spaces, the project has resumed and currently in preliminary design phases. • Suspended Logan Express service from Peabody, Woburn, and Back Bay: Services restored in 2022. • Logan Express headways reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and the new Quincy lot is helping to increase passenger capacity at Braintree in addition to the parking expansion at Framingham, which is also helping to improve passenger use. • Postponed construction of additional parking at Framingham Logan Express: Project has resumed and is in the design phase with construction currently estimated to begin in 2024. • New Logan Express suburban location: Peabody Logan Express at new North Shore location opened in 2022. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing Back Bay Logan Express. Danvers Logan Express is expected to open towards the end of 2024. • Dedicated High-Occupancy Vehicle (HOV) bus lanes: HOV prioritization initiatives, including HOV bus lanes, are underway throughout Logan Airport campus.

#	Author	Topic	Comment	Response
				Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity levels increase. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line.
A-3	EEA Secretary Certificate	Mitigation	Establish a framework and planning process for community mitigation, in collaboration with surrounding EJ populations and other community stakeholders.	The Community Relations & Government Affairs Department manages Massport's relations with community members and government officials through continuous and evolving public involvement practices that include engagement with environmental justice (EJ) communities. Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 10, *Project Mitigation*, and these will continue to be refined as growth and activity levels increase. Community benefits not tied to specific projects managed by the Community Relations & Government Affairs Department, and the Department's efforts for the 2022 reporting year are detailed in Chapter 2, *Sustainability, Outreach, and Environmental Justice,* Section 2.2.
A-4	EEA Secretary Certificate	Mitigation	The 2018/2019 EDR Certificate noted Massport's efforts, in response to a Department of Public Health (DPH) study conducted in 2014, to support public health services in the surrounding neighborhoods, including contributions to Chronic Obstructive Pulmonary Disease (COPD) treatment and the consideration of HEPA filters. Massport should demonstrate a clear commitment to revisit these prior initiatives and establish a framework and timetable for implementation.	Massport continues to work with Federal Aviation Administration (FAA) and research institutions like the Massachusetts Institute of Technology (MIT), Boston University, and Tufts University to look for ways to reduce impacts and expand research. Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5 provides an update on Massport's on-going collaboration and evolving service strategy with the Massachusetts Department of Public Health (MassDPH) and East Boston Neighborhood Health Center (EBNHC). Massport has renewed an agreement to provide funding to the EBNHC to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits. When working with the EBNHC regarding installation of high efficiency particulate air (HEPA) filters in home and other locations, representatives of the EBNHC stated that home visits would be a more effective tool than filters. Accordingly, Massport is funding a home visit program. Massport will continue to work with community-based organizations and will support science-based solutions and efforts.

#	Author	Topic	Comment	Response
A-5	EEA Secretary Certificate	Activity Levels	Massport should clearly communicate to community stakeholders its methodology for determining growth forecasts and projections, identify potential metrics or thresholds that may trigger the need to consider additional measures to reduce impacts.	Chapter 3, *Activity Levels and Forecasting*, Section 3.4, describes the forecasting methodologies used for future planning activity levels. This ESPR reports on 2022 conditions with a comparison to 2021 and 2019 conditions and captures pandemic and post-pandemic growth trends for activity levels. Project-specific planned mitigation measures are detailed in Chapter 10, *Project Mitigation*. Massport will host four public information sessions on the 2022 ESPR to provide the public with information on ESPR purpose, analysis and forecasting methodologies, and airport planning activities at Logan Airport. Three public information meetings were held prior to filing the ESPR with the Executive Office of Energy and Environmental Affairs (EEA) Massachusetts Environmental Policy Act (MEPA) Office participation. As part of the meetings, Massport communicated to community stakeholders the methodology for determining growth forecasts and projections. A fourth public information session will be held during the public comment period. Massport follows industry best practices for forecasts and considers several factors including economic conditions, airplane manufacturers' plans, future forecast aircraft in the fleet mix, social factors, and anticipated airline route plans. The assumptions and sources of data are documented in Chapter 3, *Activity Levels and Forecasting* and in Appendix F, *Activity Levels Supporting Documentation* and augmented as a result of feedback from these meetings. Additionally, data for baseline conditions from selected comparison years were added to technical chapters for the 2022 year as well as for the Future Planning Horizon conditions and assumptions. These comparisons support Massport's data-driven approach to identifying which potential impact reduction measures could be feasible options for the future in addition to providing a framework for the public audience to assess the progress of Massport's efforts to date.

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A-6	EEA Secretary Certificate	Air Quality and Emissions Reduction	Describe efforts to continue contributions to local public health services in response to more recent research on airport impacts and address emerging issues such as Ultrafine Particles and Black Carbon	Massport continues to work with FAA and research institutions like MIT, Boston University, and Tufts University to expand research including on Ultrafine Particles (UFP) and black carbon (BC). Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5, provides an update on Massport's on-going collaboration and evolving service strategy with the MassDPH and EBNHC. Studies include those described below. • Massport, in collaboration with MIT and FAA, began a first-of-its-kind project in September 2016 to identify strategies for noise reduction through changes to performance-based navigation procedures (PBN) and flight performance modifications, addressing community concerns. The technical work was completed in 2022. Recommendations have been implemented or are being implemented. Findings from the study are included in Appendix I, *Noise Supporting Documentation*, Section I.4. • Massport has supported the Boston University and Tufts University FAA-affiliated Center of Excellence for Alternative Jet Fuels and Environment, also known as the Aviation Sustainability Center (ASCENT) research studies evaluating the impact of aviation emissions on air quality in communities surrounding Logan Airport. These studies began in 2017, building on research related to highway emissions as well as studies at other major airports. The effort involved monitoring UFP and other pollutants at four sites around Logan Airport and developing statistical methods to determine aviation's contribution to air pollution. The outcomes aim to provide estimates of the magnitude and spatial extent of aviation source concentrations, validate dispersion model levels of nitrogen dioxide (NO2) and sulfur dioxide (SO2), and assess the public health impacts of aviation-related air pollution. Locations of monitors are shown in Appendix J, *Air Quality and Greenhouse Gas Supporting Documentation*, Figure J-5. Findings will be reported in future EDRs and ESPRs. • Olin College, AIR, Inc., and Aerodyne have collaborated to monitor air quality in Winthrop. Massport has supported this study by providing operational data as needed and is available to provide additional data and input as needed. Locations of monitors are shown in Appendix J, *Air Quality and Greenhouse Gas Supporting Documentation*, Figure J-5. • In 2022, Tufts University conducted a study which evaluated changes in UFP concentrations near Logan Airport during the COVID-19 pandemic in relation to mobility reductions. The study found that that, on average, particle number concentrations were lower during the first three months of the state-of-emergency phase than before the pandemic, consistent with reduced flight activity and traffic volume. Locations of monitors used in the study are shown

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				in Appendix J, *Air Quality and Greenhouse Gas Supporting Documentation*, • In 2022, Boston University conducted a study which evaluated the impact of arrival aircraft on UFP concentrations, using particle number concentration (PNC) as a proxy, across six sites near Logan Airport. The study found that that arrival aircraft contributes significantly but intermittently to ambient PNC in nearby communities, with an increase during high aircraft activity hours. Locations of monitors used in the study are shown in Appendix J, *Air Quality and Greenhouse Gas Supporting Documentation*, Figure J-5. • As part of Massport's broader NetZero plan, Massport collaborated with the Massachusetts Clean Energy Center (MassCEC) in early 2022 to study opportunities to convert the RideApp fleet, such as Uber and Lyft, serving Logan Airport to electric vehicles, with MassCEC providing a grant to initiate this work and fund Logan's Electric Vehicle (EV) charging infrastructure. • In 2020 and 2021, MIT and the Center for Air Transportation Systems Research utilized data from Massport to study single engine taxiing. Applying MIT's methodology to Logan Airport operational data showed a savings of approximately 1,006,824 gallons of jet fuel in 2020 and 1,315,105 gallons in 2021 due to single engine taxiing, reducing greenhouse gas (GHG) emissions. • In 2020, Tufts University carried out a study on the impacts of aviation emissions on residential air quality near Logan Airport, finding that pollutant concentrations were higher when the residence was downwind. Locations of monitors used in the study are shown in Appendix J, *Air Quality and Greenhouse Gas Supporting Documentation*, Figure J-5. • In 2006, 2009, and 2010, Massport conducted surveys to understand the extent of single engine taxiing at Logan Airport and supported a more detailed survey by MIT in 2009. The surveys found that single engine taxiing is an important measure used by airlines to conserve fuel. • Between 2004 and 2014, MassDPH conducted a health impact assessment of Logan Airport, focusing on noise and air quality. Massport supported this study by providing funding, operational data, and technical assistance. • Massport responded to the MassDPH study recommendations by funding the EBNHC in 2015 to expand their Asthma and COPD Prevention and Treatment Program. Massport continues to fund this effort.
A-7	EEA Secretary Certificate	Outreach	Establish a public engagement plan to govern the development of future ESPRs and EDRs. The plan should ensure that surrounding EJ populations and other community stakeholders have early and meaningful input in the development of the content of these filings, in	Massport has and will continue to enhance public engagement as part of preparing the ESPR and future EDRs. To date, three additional meetings have been convened with EEA and stakeholders regarding the format of the ESPR to develop strategies to improve readability for the general public. The first public information session on June 29, 2023, described the methodologies employed in the ESPR to develop future forecasts and technical approaches to modeling. A second session on

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			addition to having the opportunity to provide formal comment once documents are finalized and filed with the MEPA Office. The documents should be prepared in a simpler, user-friendly format that can be digested by a broad sector of the public, so that key details and commitments are not buried in voluminous, data-heavy filings.	December 12, 2023, with community advocacy group representatives and the EEA focused on review of 2020/2021 EDR comments and discussed ways to better address these comments in the 2022 ESPR. On January 17, 2024, a public information meeting provided an update on the ESPR preparation and findings. A fourth public information session will be held after the ESPR is filed with the MEPA Office during the public comment period. Broad notification of these meetings is facilitated through notices in multiple languages in newspapers, distribution to community-based organizations (CBOs) and tribes on the EEA's Environmental Justice (EJ) Reference List, previous reviewers, public libraries, and key community repositories. The list of languages into which notifications on the 2022 ESPR availability is expanded from previous EDR and ESPR iterations to further strengthen the engagement of EJ populations. The specific languages were identified using the EEA's EJ tool. Chapter 1, *Introduction and Executive Summary*, and public notices are translated into Spanish, Portuguese, Simplified Chinese, and Haitian Creole. A Babel notice, which is a short description in multiple languages that informs people of the public information session or filing and the process to acquire language access services, accompanied the public notices and email distribution of the 2022 ESPR. The Babel notice for the 2022 ESPR includes Arabic, Korean, Mon-Khmer, Russian, and Vietnamese. In addition to the public information meetings and comment period for the ESPR, Massport meets with the Massport Community Advisory Committee (CAC) and community groups on a regular basis. Projects going through the environmental review process also include public meetings during project scoping and Environmental Notification Form (ENF) phases and as part of individual project permitting, as appropriate.
A-8	EEA Secretary Certificate	Airport Planning	The 2020/2021 EDR provides a review of airport planning including previously deferred capital projects that were anticipated to provide environmental benefits including installation of a solar photovoltaic system, new electric vehicle charging stations, and several high-occupancy-vehicle (HOV) investments. While some of the highlighted projects remain deferred, the 2020/2021 EDR indicates that ground access and parking remain priority planning interests. Given the indications that activity levels are more rapidly returning to pre-pandemic levels, the 2022 ESPR should indicate a commitment to	Chapter 4, *Airport Planning*, discusses the status and approach of deferred capital projects. Table 4-2 through Table 4-5 list the projects under consideration by Massport and document their planning status and likely timeframe for implementation. Chapter 10, *Project Mitigation*, discusses mitigation for projects planned or underway. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects develop. As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, and projects are prioritized based on passenger needs and user demand. Massport has restored much of the Logan Express service that was temporarily reduced in March 2020. In addition, Massport has relocated the underperforming Peabody service to a location at the North

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			prioritize mitigation efforts and provide a timeline for deferred projects.	Shore Mall that has much better access. The North Shore Mall location is intended to rebuild and expand HOV ridership from the north. Massport continues to evaluate other urban and suburban locations. Massport reopened the Woburn and Back Bay Logan Express services in October 2022. Headways for the Braintree and Framingham Logan Express service were restored in 2021. The 1,000-parking space expansion at Framingham Logan Express is in design phase and is expected to break ground in 2024. Additionally, a feasibility study is underway at the time of this filing for a new Logan Express urban location. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 provides a status on these deferred projects as well as information on how each line of service is performing.
A-9	EEA Secretary Certificate	Content	Update the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts, documented trends, and environmental impacts. Analyze calendar year 2022 and provide projections through 2040. Follow the general format of the 2017 ESPR and include an Executive Summary and Introduction, similar to previous ESPRs and EDRs.	This 2022 ESPR reports on 2022 conditions and compares them to 2021 conditions. In addition, comparisons are made to pre-pandemic conditions (i.e., 2019) to better understand trends in light of reduced passenger demand associated with the pandemic. The 2022 ESPR updates the passenger and aircraft operations activity levels to account for recent shocks to the aviation system and anticipated future passenger demand. The 2017 ESPR forecasted that in the 2028-2032 timeframe, future forecast passenger activity levels would reach 50 million annual passengers accommodated by 486,000 aircraft operations. Due to the significant reduction in air travel due to the pandemic, the Future Planning Horizon for this 2022 ESPR was updated, and it is anticipated that the Future Planning Horizon would now reach 53.5 million annual passengers (MAP) accommodated by 495,000 aircraft operations within the approximately 10 to 15 year Future Planning Horizon from today. Each ESPR presents an updated forecast. The 53.5 million air passengers Future Planning Horizon was used as the basis for estimated anticipated noise, air quality, and ground access cumulative impacts associated with future forecast Airport activities 10 to 15 years in the future as modeled in this 2022 ESPR. See Chapter 3, *Activity Levels and Forecasting*, Section 3.5 for additional information on future conditions. Based on feedback received from the EEA and public stakeholders, the explanation on how future conditions and forecasts are derived and the methods and models used has been expanded with greater clarification on how Massport's process aligns with FAA methods and industry standard practices. The 2022 ESPR generally follows the format of the 2017 ESPR with an Executive Summary and technical chapters. To improve readability, a new chapter, Chapter 2, *Sustainability, Outreach, and Environmental Justice*, consolidates content from other chapters that addressed those topics into one location.

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A-10	EEA Secretary Certificate	Content	Consider shortening future filings to put less emphasis on historical accomplishments and only report on relevant updates, changes, and achievements, noting that historical data may be necessary for context.	Massport has responded to this comment by implementing many ESPR format enhancements to improve readability and audience accessibility including: • Shortening the overall document; • Moving technical information on methodologies and assumptions as well as supporting data used in analyses to technical appendices; • Increasing use of infographics, charts, and illustrations in place of long text explanations; • Revising text to use more common vernacular and word choice with less technical jargon; • Removing previously published materials currently available from other sources, like prior ESPR and EDR publications hosted on Massport websites; and • Using icons and call-out boxes to highlight important data or findings to facilitate faster reading and comprehension.
A-11	EEA Secretary Certificate	Activity Levels	Clarify methodologies and metrics related to growth projections and associated impacts and mitigation, so that future filings can focus on the most relevant data for assessing Massport's efforts to minimize impacts from Airport operations	Chapter 3, *Activity Levels and Forecasting*, Section 3.4.1, of the 2022 ESPR describes methodology for future forecasting. The chapter describes the use of 1) historical trends; 2) recent developments including COVID-19 recovery; and 3) outlook for future demand drivers such as local and national economic growth. The chapter also describes the use of industry-standard forecast techniques as recommended in FAA policy documents, to support the statistical econometric analysis. Massport follows industry best practices for forecasts and considers several factors including economic conditions; airplane manufacturers' plans; future forecast aircraft in the fleet mix; social factors; and anticipated airline route plans. Project-specific planned mitigation measures are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity levels increase. Other measures Massport takes to reduce operational and environmental impacts are presented in Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.2.3.

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A-12	EEA Secretary Certificate	Content	Include information on the environmental policies and planning that form the context of environmental reporting, technical studies, and environmental mitigation initiatives against which projects at Logan Airport can be evaluated. Include identification of the cumulative effects of Logan Airport operations and activities, compared to previous years, as appropriate.	Chapter 6, *Ground Access*; Chapter 7, *Noise*; Chapter 8, *Air Quality and Greenhouse Gas Emissions*; and Chapter 9, *Water Quality*, include the regulatory frameworks that guide the environmental modeling and reporting. Separate from the EDR and ESPR, each airport project subject to MEPA review follows these frameworks in the assessment of potential impacts and the development of mitigation strategies, as needed. The status of mitigation measures associated with projects' Section 61 Findings are documented in Chapter 10, *Project Mitigation*. Consistent with past ESPRs and EDRs, the 2022 ESPR describes the cumulative effects associated with overall Logan Airport operations and compares the effects to previous conditions year-over-year as well as anticipated conditions. The EDRs and ESPRs inform the projects subject to MEPA and the National Environmental Policy Act (NEPA) and serve as a baseline condition against which to assess project-specific impacts. The 2022 ESPR compares 2022 technical chapter data to 2019 and 2021, excluding 2020 due to the abnormalities during COVID-19. Additionally, the technical chapters use the following comparison years: 2011 and 2017 for Chapter 6, *Ground Access*, 1990 and 1998 for Chapter 7, *Noise* and Chapter 8, *Air Quality and Greenhouse Gas Emissions*. The reasoning for the selection of comparison years is provided in the respective chapters. As stated by the Secretary in the Certificate on the Terminal E Modernization Project, "The venue for addressing cumulative environmental impacts is through the Environmental Status and Planning Report (ESPR) and Environmental Data Reports (EDR). Through these reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment on the cumulative impacts. This regular updating and reporting on planning and cumulative impacts are unique among State Agencies."

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A-13	EEA Secretary Certificate	Mitigation	Include updated timelines for implementation of deferred mitigation projects to ensure that mitigation efforts keep up with increasing rates of travel as pandemic restrictions ease and travel resumes.	As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, and projects are prioritized based on passenger needs and user demand. Massport has restored much of the Logan Express service that was temporarily reduced in March 2020. In addition, Massport has relocated the underperforming Peabody service to a location at the North Shore Mall that has much better access. The North Shore Mall location is intended to rebuild and expand HOV ridership from the north. Massport continues to evaluate other urban and suburban locations. Massport reopened the Woburn, and Back Bay Logan Express service in October 2022. Headways for the Braintree and Framingham Logan Express service were restored in 2021. The 1,000-parking space expansion at Framingham Logan Express is in design phase and is expected to break ground in 2024. Additionally, a feasibility study is underway at the time of this filing for a new Logan Express urban location. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 provides a status on these deferred projects as well as information on how each line of service is performing. Massport will continue to provide updates on its programs through the EDR and ESPR process. Project-specific planned mitigation measures are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity levels increase. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 discusses the status and approach of deferred capital projects. Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity levels increase. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line.
A-14	EEA Secretary Certificate	Responses to Comments	Include copies of all ESPR and EDR Certificates and a distribution list for the 2022 ESPR. Supporting technical appendices should be provided as necessary.	This Appendix A, *MEPA Certificates and Responses to Comments*, includes a copy of the Secretary's Certificate on the 2020 and 2021 EDR. To reduce the volume of the 2022 ESPR, copies of previous Certificates on ESPRs and EDRs are found in previous publications which can be accessed at: https://www.massport.com/environment/project-environmental-filings/boston-logan. Refer to Appendix D, *Distribution,* for a list of the agencies and individuals who received a copy of this 2022 ESPR through an email with an online link, Notice of Availability with an online link, or a hard copy. The distribution list also includes representatives of governmental agencies, community groups, and local residents interested in activities at Logan Airport. As directed by EEA, the distribution list for the ESPR was expanded to include the EJ Reference List with the CBOs and tribes located within 5 miles of the Logan Airport campus.

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				The 2022 ESPR, along with past EDRs and ESPRs, are also publicly available on Massport's website at: https://www.massport.com/logan-airport/about-logan/environmental-reports/. Supporting appendices are provided for technical chapters and have been enhanced to focus the main body of the ESPR on key findings with the technical appendices providing information for reviewers who wish to understand the methodologies and assumptions behind the technical analyses.
A-15	EEA Secretary Certificate	Outreach	Identify EJ populations with 5 miles of the airport including languages spoken by those who identify as not speaking English very well. These communities should be included in future outreach efforts with project summaries and announcements translated into the identified languages.	As documented in the new Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4, Massport identified EJ populations and the languages spoken by more than 5 percent of the population groups within 5 miles of the Logan Airport campus. Based on this analysis, Chapter 1, *Introduction and Executive Summary*, and notices of public information sessions and filings were translated into Spanish, Haitian Creole, Portuguese, and Simplified Chinese. This expands on the past practice of-translating the Executive Summary and public notices into Spanish. In addition, public notices were made available to other language speakers in the form of a Babel notice. A Babel notice is a short description in multiple languages that informs people of the public information session or filing and the process to acquire language access services. The Babel notice accompanied the public notices and email distribution of the 2022 ESPR. The Babel notice for the 2022 ESPR includes Arabic, Korean, Mon-Khmer, Russian, and Vietnamese. Massport regularly provides Spanish interpretive services at public sessions, and other language interpretive services are available upon advance request.

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A-16	EEA Secretary Certificate	Outreach	Include a public engagement plan developed consistent with the MEPA EJ Public Involvement Protocol and review Massport's public outreach efforts prior to the filing of the ESPR. The public engagement plan should reflect strategies to provide opportunities for early and meaningful input on the development of Massport's filings, and should reflect community-based strategies beyond formal public hearings.	Massport's comprehensive ESPR public engagement strategy includes: • Meeting with stakeholders to discuss ESPR format and explain methodologies; • Supplementing annual ESPR presentation with additional public information sessions during the preparation of the ESPR; • Translating meeting public notices of public information sessions and filings in languages identified in EJ communities within 5 miles of the Airport through a combination of complete translations and Babel notices; • Distributing public notice fliers electronically to the EJ Reference List obtained from MEPA and the rest of the Distribution List, at local community repositories, and local libraries; • Posting public notices to Massport's website at: https://www.massport.com/massport/community/public-notices/; • Publishing project information on Massport's website at: https://www.massport.com/massport/community/on-going-projects/; • Posting public notices and filing notifications on social media sites; • Publishing public notices in relevant local print media, including non-English and community-specific media outlets and newspapers, such as Boston Herald, East Boston Times, Winthrop Transcript, and El Mundo; • Requesting that the MEPA Office and Massport CAC post the public notices to their website; • Providing language interpretation services for languages spoken by at least 10 percent of the census tract's population who have Limited English Proficiency (LEP); • Enabling public meeting participation in-person, virtually, or by phone to accommodate those with limited technology or transit access; • Scheduling public meetings outside the standard workday for accessibility; • Circulating the filing electronically to the EJ Reference List obtained from MEPA, government officials, persons or entities who previously commented on past filings for the project, and other identified stakeholders; • Distributing hard copies of filing documents to local libraries for ease of public access; and • Providing an extended public comment period.
A-17	EEA Secretary Certificate	Public Meetings	Provide a conceptual draft of the 2022 ESPR and hold a public information session, held at accessible location and convenient time (such as the evening or weekend) so as to maximize input and participation from EJ neighborhoods and residents before the document is finalized.	Massport has and will continue to enhance public engagement as part of preparing the ESPR and future EDRs. To date, three additional meetings have been convened with EEA and stakeholders regarding the format of the ESPR to develop strategies to improve readability for the general public. The first public information session on June 29, 2023, described the methodologies employed in the ESPR to develop future forecasts and technical approaches to modeling. A second session on

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				December 12, 2023, with community advocacy group representatives and the EEA focused on review of 2020/2021 EDR comments and discussed ways to better address these comments in the 2022 ESPR. On January 17, 2024, a public information meeting provided an update on the ESPR preparation and findings. A fourth public information session will be held after the ESPR is filed with the MEPA Office during the public review period. Broad notification of these meetings is facilitated through notices in multiple languages in newspapers, distribution to CBOs and tribes on the EEA's EJ Reference List, previous reviewers, public libraries, and key community repositories. Interpretation services in Spanish will be available and interpretation services for other languages are available on advance request. For more information and to access the presentation slides shared during the meetings, please visit: www.massport.com/logan-airport/about-logan/environmental-reports/. In addition to the public information meetings and comment period for the ESPR, Massport meets with Massport CAC and other community groups on a regular basis. Projects going through the environmental review process also include public meetings during project scoping and ENF phases as well as other permit agency hearings, as appropriate.
A-18	EEA Secretary Certificate	Outreach	Consult with the MEPA Office and EEA EJ Office in the development of the public engagement plan and involve these offices in community meetings to the extent appropriate.	On November 28, 2023, Massport met with representatives of EEA MEPA Office and the EEA EJ Director. Participants suggested methods on how to enhance the ESPR to make it more readable and accessible to reviewers. After the meeting, Massport provided requested data on EJ populations, information on recent air quality, and health studies which are included in Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4 and Section 2.5. In addition, on December 12, 2023, at a meeting convened by EEA, Massport met with representatives of Massport CAC, community advocacy groups, and the City of Boston to discuss the format of the ESPR and future filings.
A-19	EEA Secretary Certificate	Outreach	The final 2022 ESPR, together with a fact sheet translated into relevant languages, should be circulated to community-based organizations (CBOs) and tribes/indigenous organizations (EJ Reference List) provided by the MEPA Office, with as much advance notice as practicable so as to facilitate a meaningful review of surrounding EJ populations.	Similar to recent years, Massport prepared a Fact Sheet on the content and availability of the ESPR and circulated it to the CBOs and tribes noted on the EJ Reference List provided by MEPA. The public notices are translated into Spanish, Haitian Creole, Portuguese, and Simplified Chinese, and also use a Babel notice including Arabic, Korean, Mon-Khmer, Russian, and Vietnamese to convey the process of obtaining additional language access services. The notices were also placed in newspapers two weeks in advance of public information sessions.
A-20	EEA Secretary Certificate	Review Schedule	Allow for an extended comment period on the ESPR to allow for full public input and participation.	Massport voluntarily requested an extended comment period to allow the public sufficient time to review the document. The revised shortened format of the ESPR is intended to facilitate easier public review of the document and its findings.

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A-21	EEA Secretary Certificate	Outreach	Consistent with prior practice, the Executive Summary for the 2022 ESPR should be translated into Spanish and any other languages identified with input from the EEA EJ Director as representing languages spoken by a significant percentage of Limited English Proficiency (LEP) residents within the 35 communities represented by the MCAC. The identified languages should be used when distributing notice of public meetings and other relevant materials.	Massport evaluated languages spoken by at least 5 percent of a census tract with a population that does not speak English very well or at all within 5 miles of the Logan Airport campus and within the 35 Massport CAC communities. Per this language needs assessment, the language list for the 2022 ESPR has been expanded from previous EDR and ESPR iterations, which included only Spanish translations. Chapter 1, *Introduction and Executive Summary*, and public notices are translated into Spanish, Portuguese, Simplified Chinese, and Haitian Creole for the 2022 ESPR to expand the accessibility of the ESPR to EJ populations. A Babel Notice, which is a short description in multiple languages that informs people of the public information session or filing and the process to acquire language access services, accompanied the public notices and email distribution of the 2022 ESPR. The Babel Notice for the 2022 ESPR includes the languages of Arabic, Korean, Mon-Khmer, Russian, and Vietnamese.
A-22	EEA Secretary Certificate	Outreach	Contain a section on Environmental Justice and discuss public outreach activities conducted pursuant to Massport's public engagement plan.	This 2022 ESPR includes a new chapter dedicated to discussing community benefits, outreach, and activities. Chapter 2, *Sustainability, Outreach, and Environmental Justice*, also documents the additional public outreach efforts by Massport as part of the ESPR preparation process. The chapter also provides centralized information on Massport's efforts regarding sustainability, resiliency, and Massport's *Roadmap to Net Zero by 2031* GHG goals, which will benefit surrounding communities.
A-23	EEA Secretary Certificate	Outreach	Report on discussions with stakeholders regarding methodologies for growth projections, relevant metrics for assessing Airport impacts, and a framework for community mitigation in consideration of growth trends and associated impacts, as well as emerging research and science around public health impacts of airport operations in the U.S. Northeast and other regions.	Massport met with representatives of EEA, including MEPA and EJ representatives, and other stakeholders to review the forecast methodology, assumptions and preliminary findings. Massport follows industry best practices for forecasts and considers several factors including economic conditions; airplane manufacturers' plans; future forecast aircraft in the fleet mix; social factors; and anticipated airline route plans. The assumptions and sources of data are documented in Chapter 3, *Activity Levels and Forecasting*, Section 3.4, and in Appendix F, *Activity Levels Supporting Documentation*. Stakeholders' comments were discussed in a public information session held on November 28, 2023, and also in a stakeholder meeting convened by EEA on December 12, 2023. Feedback from these meetings resulted in additional clarification being provided in applicable chapters as well as in Appendix F, *Activity Levels Supporting Documentation*. Emerging research on health impacts around airports is documented in Chapter 8, *Air Quality and Greenhouse Gas Emissions*. Section 8.5.

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A-24	EEA Secretary Certificate	Mitigation	Reflect a clear commitment by Massport to return to prior environmental commitments, including contributions to local public health services, that were begun prior to the Covid-19 pandemic.	Massport has renewed an agreement to provide funding to the EBNHC to help expand the efforts of its Asthma and COPD Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, and other efforts. Massport will continue to engage with the Health Center to identify additional opportunities to provide additional support. When working with the EBNHC regarding installation of HEPA filters in home and other locations, representatives of the Center stated that home visits would be a more effective tool than filters. Accordingly, Massport is funding the home visit program. EBNHC's Asthma and COPD Home Visiting Program is a no-cost program funded by Massport for patients with uncontrolled asthma or COPD. Through the program, trained community health workers help patients learn to address asthma or COPD triggers at home, reduce asthma or COPD symptoms, and correctly use asthma or COPD medications. Eligible participants receive four home visits over a six-month period. Massport continues to work with FAA and research institutions like MIT, Boston University, and Tufts University to look for ways to reduce impacts and expand research. Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5 provides an update on its on-going collaboration and evolving service strategy with the MassDPH and EBNHC. Massport will continue to work with community-based organizations and will support science-based solutions and efforts.
A-25	EEA Secretary Certificate	Content	Continue to report passenger and activity levels and consider planning/mitigation commensurate with this more rapid growth; in particular, air, noise, and traffic reduction measures should be a significant emphasis of the 2022 ESPR.	The 2022 ESPR continues to report on passenger activity levels and aircraft operations for the reporting year and also for future forecast conditions. See Chapter 3, *Activity Levels and Forecasting*, for more information. Mitigation measures associated with project-specific comments are provided in Chapter 10, *Project Mitigation*. This 2022 ESPR includes a new chapter, Chapter 2, *Sustainability, Outreach, and Environmental Justice*, which also documents the additional efforts by Massport to plan for and address issues associated with anticipated future growth, including centralized information on Massport's efforts regarding sustainability, resiliency, and Massport's *Roadmap to Net Zero by 2031* GHG goals.

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A-26	EEA Secretary Certificate	Airport Planning	Indicate a clear commitment to implementing deferred capital projects to ensure that these measures are taken to reduce impacts commensurate with activity levels as the economy recovers and the demand for air travel returns to the rate of growth seen before the pandemic.	As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, and projects are prioritized based on passenger needs and user demand. Updates on projects deferred due to COVID-19 are discussed in the ESPR and summarized as follows: • Postponed Terminal E Improvement Phases 1 and 2: Terminal E Phase 1 opened in October 2023, and the next phase to add four new gates is currently in conceptual planning process. • Postponed Parking Garage in front of Terminal E: Permitted for up to an additional 5,000 spaces, the project has resumed and currently in preliminary design phases. • Suspended Logan Express service from Peabody, Woburn, and Back Bay: Services restored in 2022. • Logan Express headways reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and the new Quincy lot is helping to increase passenger capacity at Braintree in addition to the parking expansion at Framingham, which is also helping to improve passenger use. • Postponed construction of additional parking at Framingham Logan Express: Project has resumed and is in the design phase with construction currently estimated to begin in 2024. • Peabody Logan Express at new North Shore location opened in 2022. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing Back Bay Logan Express. Danvers Logan Express is expected to open towards the end of 2024. • Dedicated HOV bus lanes: HOV prioritization initiatives, including HOV bus lanes, are underway throughout Logan Campus. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 discusses the status and approach of deferred capital projects. Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity levels increase. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line.

#	Author	Topic	Comment	Response
A-27	EEA Secretary Certificate	Activity Levels	Report on: • Aircraft operations, including fleet mix and scheduled airline services at Logan Airport; • Domestic and international passenger activity levels; • Cargo and mail volumes; • Comparison of 2022 aircraft operations, cargo/mail operations, and passenger activity levels to 2019 and 2020-21 activity levels; and • Report on national aviation trends in 2022, the effect of the pandemic, and compare to trends at Logan Airport.	Chapter 3, *Activity Levels and Forecasting*, reports on aircraft operations, existing and anticipated aircraft types in the fleet mix, and airline activities at Logan Airport. For the 2022 reporting year, the chapter reports on domestic and international passenger activity levels and associated aircraft operations, and documented cargo and mail volumes as reported by the carriers. To place these findings in context, comparisons are made to 2021 and pre-pandemic conditions (i.e., 2019) to help understand Logan Airport and national trends. For the future planning activity levels, the chapter describes the forecast methodology and discusses the anticipated passenger and aircraft activity levels associated with the Future Planning Horizon. These forecasts establish the assumptions and provide the model-derived data used for the estimation of ground access, noise, air quality, and GHG emissions conditions 10 to 15 years into the future. The updated Future Planning Horizon anticipates that in the 10 to 15-year horizon annual passengers will reach 53.5 million accommodated by 495,000 aircraft operations. Each ESPR presents an updated passenger and aircraft operations activity forecast.
A-28	EEA Secretary Certificate	Activity Levels	Update the Logan Airport long-term passenger forecast to reflect growth trends at Logan Airport and revised expectations for the local/national/international economy including current recovery from the COVID-19 pandemic. Planning and impact sections will be based on forecasting for the next five years (2023-2027). Address methodologies and assumptions used in the analysis, including anticipated changes to fleet mix changes and other trends in the aviation industry.	Chapter 3, *Activity Levels and Forecasting*, describes methodology for future forecasting, including future growth. Massport follows industry best practices for forecasts and considers several factors including economic conditions; airplane manufacturers' plans; future forecast aircraft in the fleet mix; social factors; and anticipated airline route plans. Additional explanation on forecasting methodologies is provided in Chapter 3, *Activity Levels and Forecasting*, Section 3.4 and Appendix F, *Activity Levels Supporting Documentation*. Forecasts also considered current conditions relative to COVID-19 recovery trends and the anticipated effects of both local, regional, and national recovery trends on future conditions at Logan Airport. To improve the presentation of this complex information, the description of the forecasting methodologies is enhanced with graphics, tables, and icons. The Future Planning Horizon considers conditions 10 to 15 years into the future, which informs Massport's planning activities and operational preparedness. The Future Planning Horizon developed for the *2022 ESPR* resulted in future planning activity levels of 53.5 million air passengers accommodated in 495,000 aircraft operations.

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A-29	EEA Secretary Certificate	Activity Levels	Provide: • Updated forecasts for passenger volume, aircraft operations, and fleet mix; • A comparison of 2022 operations to historic trends and 5-year and 2040 forecasts; and • A comparison of forecast activity levels to Massport forecasts from previous ESPRs, FAA forecasts and the U.S. aviation industry.	Chapter 3, *Activity Levels and Forecasting*, Section 3.5, describes the methodology for future forecasting and includes future growth assumptions. The forecast encompasses conditions over a Future Planning Horizon of 10 to 15 years, which informs Massport's planning activities and future operational preparedness. Following industry best practices, Massport's forecast is within 10 to 15 percent of the FAA's Terminal Area Forecast (TAF) as documented in Chapter 3, *Activity Levels and Forecasting*, Section 3.5. As shown in Chapter 3, *Activity Levels and Forecasting*, Figure 3-17, ESPR forecasts are updated approximately every five years, and forecast estimations made have tended to track closely with the actual activity levels observed for the years initially estimated in the respective ESPR publications. The planning activity levels forecasted for 10 to 15 years in the future were estimated to be 53.5 million air passengers accommodated in 495,000 aircraft operations based on current data observations and trend analysis. These data estimates provided the basis for deriving future forecast fleet mixes, airline schedules, and airline destinations, which were input into the models used for air quality and noise technical assessments.
A-30	EEA Secretary Certificate	Outreach	Establish a public engagement plan to engage with the MCAC and other stakeholders as it develops a methodology for future growth projections. Report on the results of this consultation and provide a clear, easily digestible description of methodology that will be understood by a broad sector of the public. Methodology should be carried forth in annual EDRs during the next five-year ESPR reporting period.	Massport has and will continue to enhance public engagement as part of preparing the ESPR and future EDRs. To date, three additional meetings have been convened with EEA and stakeholders regarding the format of the ESPR to develop strategies to improve readability for the general public. The first public information session on June 29, 2023, described the methodologies employed in the ESPR to develop future forecasts and technical approaches to modeling. In addition, explanations for forecasting methodologies have been expanded in the relevant technical chapters to provide readers with a better understanding of the process and how it is derived from FAA standards and industry best practices. A second session on December 12, 2023, with community advocacy group representatives and the EEA focused on review of 2020/2021 EDR comments and discussed ways to better address these comments in the 2022 ESPR. On January 17, 2024, a public information meeting provided an update on the ESPR preparation and findings. A fourth public information session will be held after the ESPR is filed with the MEPA Office during the public comment period. Broad notification of these meetings is facilitated through notices in multiple languages in newspapers, distribution to CBOs and tribes on the EEA's EJ Reference List, previous reviewers, public libraries, and key community repositories. Massport will continue to engage Massport CAC, community advocacy groups, the City of Boston, and other stakeholders in forecast, findings, and format discussions for future filings during EDR and ESPR development. Frequency of meetings will be determined by request and nature of findings.

#	Author	Topic	Comment	Response
A-31	EEA Secretary Certificate	Airport Planning	Continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport must accommodate and guide tenant development.	Massport works closely with its tenants and leaseholders to guide development and facility improvements through several mechanisms. First, tenants must submit a Tenant Alteration Application for projects including new construction as well as internal fit out of tenant space. Second, tenants are subject to Massport's *Sustainability and Resiliency Design Standards and Guidelines* (to be updated in 2024), which lay out minimum guidelines that tenant developments must meet. Third, Massport project managers work closely with tenants and their consultants during the feasibility, design, construction and operations phases of development to meet Massport's net zero and environmental goals.
A-32	EEA Secretary Certificate	Airport Planning	Describe the status of planning initiatives for the following areas: • Roadways and Airport Parking • Terminal Area • Airside Area • Service and Cargo Areas • Airport Buffers and Landscaping • Energy, Sustainability, and Resiliency.	Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 describes the projects under consideration by Massport and documents their planning status and likely timeframe for implementation. A new chapter, Chapter 2, *Sustainability, Outreach, and Environmental Justice* is included in the ESPR that consolidates information on Massport's sustainability, resiliency and net zero GHG emissions strategies into one location.
A-33	EEA Secretary Certificate	Airport Planning	Indicate the status of long-range planning activities, including the status of public works projects implemented by other agencies within the boundaries of Logan Airport.	Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 describes the projects under consideration by Massport and documents their planning status and likely timeframe for implementation. In the reporting year, no projects were undertaken by other agencies within the boundaries of Logan Airport.
A-34	EEA Secretary Certificate	Ground Access	Identify the status and assess effectiveness of ground access changes, including roadway and parking projects, that consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on streets in adjacent neighborhoods.	Massport assessed mode share data from the *2022 Air Passenger Ground Access Survey*, which showed the effects of the pandemic on passenger choices in travel to and from the Airport, with private automobiles transporting passengers that previously accessed the Airport via HOV, RideApp-based services, or taxis. Massport had a goal of reaching 35.5 percent HOV mode share by 2022 and 40 percent by 2027. Based on the results of the *2022 Air Passenger Ground Access Survey*, the interim HOV mode share was reached.

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A-35	EEA Secretary Certificate	Mitigation	Where key environmental mitigation projects have been deferred, Massport should describe the decision-making process and factors that will be used to inform the timing of its implementation. While the Scope for the 2018-2019 EDR required a disclosure of this decision-making, the EDR was not fully responsive as it provided details on the status of multiple projects without a clear framework for determining when deferred projects, particularly those intended to mitigate air emissions impacts of Airport operations, would be implemented	As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, such as Logan Express services and the Terminal E parking garage. Projects are prioritized based on current and anticipated passenger needs and user demand. While factors like results of forecasting studies on future demand and activity levels; input from community groups and stakeholders; environmental objectives like Massport's *Roadmap to Net Zero by 2031* program; ground transportation and aircraft operations studies; constraints assessments including ancillary effects on operational efficiencies; safety concerns; and the degree of positive impact from a project may all inform the decision-making process and implementation timing, the primary factor driving the order in which projects are resumed is the overall necessity of a given project to accommodate the current needs of the Airport's users. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 discusses the status of deferred capital projects and provides discussion on the methodology for when these projects will resume, and Chapter 4, *Airport Planning*, Table 4-1 summarizes Massport's short and long-term planning initiatives as well as a current status schedule for implementation. Planned mitigation measures for specific projects at Logan Airport and information on deferrals and when projects will resume are detailed in Chapter 10, *Project Mitigation*, and Massport will continue to refine estimates and resume previously planned projects as growth and activity levels increase. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line.

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A-36	EEA Secretary Certificate	Mitigation	Indicate a clear commitment to return to prior environmental commitments relative to capital projects intended to minimize air emissions impacts, and identify the metrics, monitoring data, or other criteria that will be used to inform when it will be implemented based on future increases in demand for air travel as the economy recovers	As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, and projects are prioritized based on passenger needs and user demand. Massport has restored much of the Logan Express service that was temporarily reduced in March 2020. In addition, Massport has relocated the underperforming Peabody service to a location at the North Shore Mall that has much better access. The North Shore Mall location is intended to rebuild and expand HOV ridership from the north. Massport continues to evaluate other urban and suburban locations. Massport reopened the Woburn, and Back Bay Logan Express service in October 2022. Headways for the Braintree and Framingham Logan Express service were restored in 2021. The 1,000-parking space expansion at Framingham Logan Express is in design phase and is expected to break ground in 2024. Additionally, a feasibility study is underway at the time of this filing for a new Logan Express urban location. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 provides a status on these deferred projects as well as information on how each line of service is performing. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2, discusses the status of deferred capital projects and provides discussion on the methodology for when these projects will resume, and Chapter 4, *Airport Planning*, Table 4-1 summarizes Massport's short and long-term planning initiatives as well as a current status schedule for implementation. Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity levels increase. Each project discussed in Chapter 10, *Project Mitigation* has completed the requisite state and federal environmental reviews and have adopted mitigation plans that have been formalized with individual Section 61 Findings. Massport tracks both Massport and Logan Airport tenants' progress towards implementing and meeting their environmental mitigation commitments on schedule and in accordance with the requirements set forth in the Section 61 Findings for each project. As each project moves forward through its design and construction phases, its mitigation plan is implemented with on-going tracking to verify compliance. Tables in the project-specific sections of Chapter 10, *Project Mitigation* describe each project's current implementation status for measures that occurred in 2022. Appendix A, *Secretary's Certificate and Responses to Comments*, contains the Secretary's Certificate issued for the ENFs, Draft Environmental Impact Reports (DEIR), and Final Environmental Impact Reports (FEIR) for the projects discussed in this Appendix.

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A-37	EEA Secretary Certificate	Regional Transportation	The 2022 ESPR should report on: Regional Airports • 2022 regional airport operations, passenger activity levels, and schedule data within an historical context; • Status of plans and new improvements as provided by the regional airport authorities; • Regional economic factors; • Role of the Worcester Regional Airport and Hanscom Field in the regional general aviation system and Massport's efforts to promote these airports; and • Ground access improvements. • Regional Transportation System • Massport's role in managing the regional transportation aviation facilities; • Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and • Report on metropolitan and regional rail initiatives and ridership.	Logan Airport is the centerpiece of the three airports owned and operated by Massport. It is the primary international and domestic airport operating within the network of New England regional airports. Massport also owns and operates Worcester Regional Airport and Hanscom Field, both of which play important roles in the New England regional transportation system. Throughout 2022, Logan Airport and regional airports, including Worcester Regional Airport and Hanscom Field, saw a gradual rise in domestic and international air travel compared to previous years, as described in Chapter 5, *Regional Transportation,* Section 5.3. While regional airports had a slower recovery due to reliance on markets that were slower to reopen, they have made significant strides, and by the end of 2022 the broader aviation industry was approaching pre-pandemic passenger levels. However, regional airports like Manchester-Boston Regional Airport (MHT) and Rhode Island T.F. Green International Airport (PVD) achieved pre-COVID-19 passenger levels slightly faster than Logan Airport as they are less reliant on international and business travel demands described in Chapter 5, *Regional Transportation*, Section 5.3. Throughout this period, Massport has actively managed Logan Airport, Worcester Regional Airport, and Hanscom Field and cooperated with other transportation agencies to promote regional transportation efficiency. This includes participating in regional rail initiatives, which saw Amtrak's Northeast Corridor nearly doubling its ridership in 2022 compared to the previous year, but still remained less than ridership recorded in 2019, as described in Chapter 5, *Regional Transportation,* Section 5.3. Ground access to Logan Airport has continued its rebound to higher numbers of HOV as described in Chapter 6, *Ground Access,* Section 6.3.

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A-38	EEA Secretary Certificate	Ground Access	Report on 2022 ground access conditions at the airport and provide a comparison to 2019, 2020, and 2021 for the following: • Description of compliance with Logan Airport Parking Freeze; • HOV ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express) and description of compliance with HOV goals and explanation of methodology for determining compliance; • Logan Airport Employee Transportation Management Association (Logan TMA) services; • Logan Airport gateway volumes; • On-airport traffic volumes; • On-airport VMT; • Parking demand and management (including rates and duration statistics); • Status of long-range ground access management strategy planning and the connection to the MBTA Airport Station associated with the planned Terminal E Modernization; • Results of the 2022 Logan Airport Air Passenger Ground-Access Survey; and, • Status of proposed connector to the Airport Station associated with the planned Terminal E Modernization Project.	Chapter 6, *Ground Access,* presents this information, as available. Massport has a comprehensive, multi-pronged trip reduction strategy to diversify and enhance ground transportation options for passengers and employees traveling to and from Logan Airport. The ground transportation strategy is designed to offer passengers traveling to and from Logan Airport a choice of HOV, transit, and shared-ride options that are convenient and reliable, and that reduce environmental and community impacts. An update and comparison of the requested ground access conditions can also be found in Chapter 6, *Ground Access,* Section 6.3.
A-39	EEA Secretary Certificate	Ground Access	The [Ground Transportation] chapter should present a discussion of analytical methodologies and assumptions for the planning horizon year (2040) for traffic volumes, on-airport VMT and parking demand.	Chapter 6, *Ground Access,* Section 6.6, guided by the future forecasted passenger levels detailed in Chapter 3, *Activity Levels and Forecasting*, Section 3.4 provides methodologies and assumptions for the Future Planning Horizon of 53.5 MAP. Traffic volumes, on-Airport Vehicle Miles Traveled (VMT), and parking demand methodologies, assumptions, and future forecasts are detailed in Chapter 3, *Activity Levels and Forecasting*, Section 3.5.

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A-40	EEA Secretary Certificate	Ground Access	[In the Ground Transportation chapter] address the following topics: • Target HOV mode share and incentives; • Impact of ride-apps on Logan Airport landside operations and effectiveness of the RideApp Management Plan; • Update on parking conditions; • Non-Airport through-traffic; • Cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Silver Line, Water Transportation, and Logan Express; • Report on efforts to increase capacity and use of Logan Express; Progress on enhancing water transportation to and from Logan Airport; • Results and recommendations of the ground access study Long-term Parking Management Plan required by the Parking Freeze amendments; and • Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.	Chapter 6, *Ground Access*, Section 6.1 through Sectio 6.4presents the requested topical information for 2022. Since March 2020, air traffic and passenger activity levels have been significantly affected by concerns about COVID-19. As passenger levels recover towards 2019 levels, Massport continues to evaluate and plan for the recovery of air passenger activity and remains committed to implementing the broad range of ground access strategies that are outlined throughout the chapter. The current status of those improvements is detailed in Chapter 4, *Airport Planning*, Section 4.1.
A-41	EEA Secretary Certificate	Noise	The 2020/2021 EDR reports that about 29 percent of 2020 and 2021 operations were conducted in aircraft meeting the requirements for Stage 5 certification, 69 percent meeting Stage 4 certification, and the remaining 2 to 3 percent meeting only Stage 3 certification. The 2020/2021 EDR does not provide this same metric for 2019 as means of comparison. Data is provided by carrier but not as a percentage of total 2019 operations.	Chapter 7, *Noise*, Table 7-3, of the 2022 ESPR presents the percentage of commercial jet operations by 14 Code of Federal Regulations Part 36 aircraft certification/stage category for 2019, as well as for 1990, 1998, 2000, and 2010, for comparison to 2022. In 2022, 33.6 percent meet Stage 5 requirements, 65.3 percent met Stage 4 requirements with the remainder comprising Stage 3.

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A-42	EEA Secretary Certificate	Noise	In 2022, Massport was approved for an initial grant by the FAA to fund the upfront work related to sound insulation including outreach to eligible homes, application process, pre-testing, and design/bid documents for homes that pass the FAA required pre-testing. Homes that pass the pre-testing will be used as pilots to inform future phases of the program. The 2022 ESPR should contain an update on the initial phase and the progress on additional grant applications to ensure sound insulation is available to qualified residences.	In January 2020, Massport's CEO sent a letter to the FAA Associate Administrator requesting that Massport and the FAA work together to address re-treatment of homes that were sound insulated during the initial years of the program. This included potentially upgrading treatments in eligible homes with newer, more effective, and more durable materials. The Associate Administrator responded that the FAA was exploring limited circumstances under which Massport might be able to re-assess homes that had been mitigated before the FAA first issued sound insulation standards in 1993. The first step in this process was for Massport to submit an updated Residential Sound Insulation Program (RSIP) Noise Exposure Map (NEM). Massport submitted an Aviation Environmental Design (AEDT) Tool-derived 2019 NEM to FAA in 2020 for review and discussion. At that time, the FAA had requested that the updated sound insulation program contour represent 2019 operational conditions due to the significant reduction in aircraft operations in 2020 resulting from the COVID-19 pandemic. It was subsequently determined by FAA that a 2020 NEM would be more appropriate. It is recognized that as air traffic activity rebounds, the day night average sound level (DNL) contours will grow and Massport will update subsequent NEMs so that the RSIP will continue to be based on the latest Logan Airport noise environment. FAA accepted the 2020 NEM on December 20, 2021, and Massport re-started its RSIP in 2022. Massport selected a consulting team that will survey eligible program areas to identify potentially eligible properties that meet the FAA's new criteria for a pilot program. In 2022, Massport applied for and was approved for an initial grant by the FAA to fund the beginning phase of the RSIP program. The consulting team Massport selected has begun surveying eligible RSIP areas to identify potentially eligible properties that meet the FAA's program criteria. Massport selected ten residences for the pilot phase of the RSIP and the project is currently in the design phase. Massport is preparing for Phase 1 of the RSIP by submitting an updated noise exposure map which will be used as a basis for FAA to approve this phase of the RSIP. The RSIP program is described further in Chapter 7, *Noise*, Section 7.4. Massport continues to pursue additional FAA grants, as they become available, to support sound insulation of qualified residences.

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A-43	EEA Secretary Certificate	Noise	Provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling.	Appendix I, *Noise Supporting Documentation*, Section I..1.4 of this 2022 ESPR describes the regulatory framework for aircraft noise that this 2022 ESPR follows. Regulations discussed include the Logan Airport Noise Abatement Rules and Regulations and Federal Aviation Regulation (FAR) Parts 36, 91, 150, and 161. Appendix I, *Noise Supporting Documentation*, Section I.1 also includes background information on the fundamentals of acoustics and environmental noise, the effects of aircraft noise on people, and the noise modeling process and results. Chapter 7, *Noise*, Section 7.2 and Appendix I, *Noise Supporting Documentation*, Section I.2.5 describe the 2022 runway use, aircraft fleet mix, aircraft flight operations, and modeled noise conditions at Logan Airport. Findings are compared to those for 2019 and 2021, and to selected prior years.
A-44	EEA Secretary Certificate	Noise	The [noise] chapter should report on 2022 conditions and provide a comparison to 2020, 2021 and 2019 for the following: • Fleet Mix, including Stage 3, and qualifying Stage 4 and Stage 5 aircraft; • Nighttime operations; • Runway utilization (report on aircraft and airline adherence with runway utilization goals); and, • Flight tracks.	Chapter 7, *Noise*, Section 7.2, and Appendix I, *Noise Supporting Documentation*, Section I.2 describe the 2022 runway use, aircraft fleet mix, aircraft flight operations, nighttime noise, flight tracks, and modeled noise conditions at Logan Airport. Findings are compared to those for 2019 and 2021, and to selected prior years.
A-45	EEA Secretary Certificate	Noise	The noise chapter should report on the following: • Changes in annual noise contours and noise-impacted population; • Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed; • Cumulative Noise Index (CNI); • Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and • Flight track monitoring noise reports.	Chapter 7, *Noise*, Section 7.2 and Appendix I, *Noise Supporting Documentation*, Section I.3 describe changes in annual noise contours and noise-impacted population; measured versus modeled noise values, including reasons for differences, and updates to the noise monitoring equipment. To better understand the noise environment, the chapter also reports on supplemental metrics including Cumulative Noise Index (CNI), Times-Above for 65, 75, and 85 decibels (dBA) threshold values and Dwell and Persistence of noise levels. Flight track monitoring noise reports. For 2022 are included in Appendix I, *Noise Supporting Documentation*, Section I.5

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A-46	EEA Secretary Certificate	Noise	Report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) and report on the status of Block 1 and 2 of the RNAV Pilot Project.	Massport's emphasis on noise abatement has focused on the benefits of better analysis tools, involvement in noise research projects, and improved modeling techniques. The Logan Airport noise mitigation program includes operational restrictions on certain runways, limits to engine runup locations, late night runway preference, and noise abatement turns. Other continuing elements of Massport's efforts to monitor and reduce noise are discussed in Chapter 7, *Noise*, Section 7.4. As discussed in Chapter 7, *Noise*, Section 7.2, Massport participated in the FAA Boston Logan Airport Noise Study (BLANS), which established Area Navigation (RNAV) departure procedures off most runways at Logan Airport to avoid populated areas and an over water visual approach at night to keep aircraft offshore as much as possible. As described in Chapter 7, *Noise*, Section 7.2, the final BLANS project report was issued in April 2017. Massport has been working with MIT, Massport CAC, and FAA to evaluate runway use and PBN procedures as part of the RNAV Pilot Project since 2016. Completed in 2021, the RNAV Pilot Project assessed the impacts of the FAA's introduction of new, more precise flight procedures and made recommendations to reduce impacts. A report on Block 1 recommendations for procedures that would not result in shifting noise from one area to another, and that would not have significant operational and technical implications was completed in December 2017. A report on Block 2 recommendations for procedures that could result in noise increases in some areas or face technical barriers that would require further review was released in December 2021. The RNAV Study resulted in four procedures being put forth for implementation. Massport submitted a request to the FAA for review and implementation of two Block 1 procedures at Logan Airport on November 12, 2020. These include modifying the existing RNAV Standard Instrument Departure (SID) from Runway 15R to move tracks over water, and a new over-water Required Navigational Performance (RNP) approach. The FAA completed development of these two Block 1 procedures and published the procedures in December 2021. On January 19, 2022, Massport submitted a request to the FAA for review and implementation of two Block 2 procedures at Logan Airport. These include modifying the existing RNAV SID from Runways 22R and 22L to enable an earlier turn to the east and adding a new over-water RNAV approach for Runway 22L.The Block 2 report is available on the MIT website at: https://dspace.mit.edu/handle/1721.1/131242. Massport continues to coordinate with Massport CAC, FAA, and MIT on targeted, follow-on technical questions and reviews. See Chapter 7, *Noise*, Section 7.4 for more information.

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A-47	EEA Secretary Certificate	Resiliency	The 2020/2021 EDR reports that the upcoming 2022 SMP will outline [sustainability] performance throughout the global pandemic (2020 and 2021) and will also serve to close out the performance targets of the 2015 SMP. The 2022 ESPR should provide a summary of 2022 and future [sustainability] goals.	In 2024, Massport will publish the 2022/2023 Sustainability and Resiliency Report. The Report, which will be available in a web format and as an electronic document for download, will report on sustainability and resilience efforts undertaken by Massport. It will also review the Massport-wide *Roadmap to Net Zero by 2031* GHG reduction commitment to be net zero GHG emissions for those activities under Massport's control by 2031, Massport's 75th anniversary. A summary of sustainability successes and strategics is provided in the newly added Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.1.
A-48	EEA Secretary Certificate	Resiliency	Report on all climate resiliency measures planned or implemented/constructed.	A summary of sustainability successes and strategic initiatives is provided in a new ESPR chapter; Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.1. Massport reports on progress towards resiliency goals in its Annual Sustainability and Resiliency Reports. Additional information about Massport's resiliency initiatives is available at: https://www.massport.com/environment/sustainability/resiliency.
A-49	EEA Secretary Certificate	Resiliency	Report on the status of projects undertaken to prevent impacts from future climate change including reporting on specific projects implemented to protect against sea-level rise. It should report on planning initiatives to improve resiliency including any updates to the DIRP.	Updates on climate-related projects are provided in both the historical Sustainability and Resiliency Report and planned for the upcoming report and are also included in relevant sections of the 2022 ESPR. The Disaster and Infrastructure Resiliency Planning (DIRP) study will not change or be updated as it was a point-in-time analysis leading to the subsequent efforts which are reported on as noted above. Any additional climate studies in the future will be noted as well in future Sustainability and Resiliency Reports and ESPRs / EDRs.
A-50	EEA Secretary Certificate	Energy	The Certificate on the 2018/2019 EDR requested that Massport consider comments from the Department of Energy Resources (DOER) which recommend electrification of space and water heating, as well as evaluation of opportunities for distributed renewable energy generation. DOER comments on the 2020/2021 EDR reiterate these recommendations, which should be addressed in the 2022 ESPR.	The Massport Infrastructure Conditions Assessment and Building Conditions Assessment (MICA-BCA) Study is an asset assessment conducted by third parties that includes next steps toward infrastructure improvements and associated energy-saving measures. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) audits are being conducted part of the MICA-BCA Study, which will identify electrification opportunities. There are additional distributed energy and on-site renewable energy projects on-going at Massport as part of its *Roadmap to Net Zero by 2031*. One such project includes the work to evaluate net zero options for the Logan Central Heating Plant, including electrification options. Electrification is a main component of Massport's decarbonization efforts. Massport is evaluating opportunities for additional on-site photovoltaic (PV) solar development and other distributed energy resources such as battery storage. Massport continues to maintain existing PV arrays at Logan.

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				The *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) which are currently being updated, support electrification for rehabilitation and construction projects across Massport campuses. The SRDGs include Leadership in Energy and Environmental Design (LEED©), Envision, and Parksmart requirements to further Massport's electrification and energy efficiency efforts.
A-51	EEA Secretary Certificate	Air Quality and Emissions Reductions	Continue to report on all initiatives to reduce GHG emissions from all Airport sources, including deferred capital projects intended to reduce mobile source GHG emissions from ground transportation to and from the Airport. To the extent feasible, Scope 3 emissions should distinguish aircraft and ground transportation sources as separate sub-categories of emissions.	Massport's initiatives associated with GHG emission reductions will continue to be reported in the 2022 ESPR. Consistent with prior EDRs and ESPRs, the 2022 ESPR Scope 3 emissions will be reported as aircraft, ground service equipment (GSE), auxiliary power units (APUs), and passenger and employee ground transportation as shown in Chapter 8, *Air Quality and Greenhouse Gas Emissions,* Section 8.3.
A-52	EEA Secretary Certificate	Air Quality and Emissions Reductions	Continue to quantify [GHG] for aircraft, GSE, motor vehicles, and stationary sources using emission factors and methodologies outlined in the Greenhouse Gas Emissions Policy and Protocol issued by EEA, the Transportation Research Board's Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories, and the ACRP and ACA.	Consistent with prior EDRs and ESPRs, the 2022 GHG emissions assessment followed the guidance issued by the Transportation Research Board's (TRB) Airport Cooperative Research Program (ACRP) Report 11: *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories*. Additionally, the 2022 GHG emissions were assessed following the guidance of the Airports Council International (ACI) Airport Carbon Accreditation (ACA) Program. For more details, see Chapter 8, *Air Quality and Greenhouse Gas Emissions,* Section 8.2.

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A-53	EEA Secretary Certificate	Air Quality and Emissions Reductions	The results of the 2022 GHG emissions inventory should be compared to the 2019, 2020 and 2021 results as the EDR indicates that 2020 and 2021 are not representative.	In the 2022 ESPR, discussions and a comparison table are presented showing total GHG emissions by scope for the years 2019, 2020, 2021, and 2022. Additionally, GHGs are computed for a Future Planning Horizon, as detailed in Chapter 8, *Air Quality and Greenhouse Gas Emissions,* Section 8.4. Total modeled airport emissions of volatile organic compounds (VOCs), oxides of nitrogen (NOX), carbon monoxide (CO), and particulate matter (PM10/PM2.5) increased from 2021 to 2022. The total modeled emissions of VOC, NOX, and CO decreased from 2019 to 2022. PM10/PM2.5 emissions increased in 2022 compared to 2019 levels. The GHG analysis included the following key findings: • In 2022, Massport-controlled (i.e., Scope 1) emissions represent 5.4 percent; in-direct emissions from purchased electricity (i.e., Scope 2) represent 7.3 percent; and emissions which are public, and tenant owned and controlled (i.e., Scope 3) represent 87.3 percent of total Logan Airport GHG emissions. • Total Logan Airport GHG emissions (i.e., Scopes 1, 2, and 3) increased from 2021 to 2022 but remained below 2019 levels. The increase from 2021 to 2022 is primarily attributable to the increase in operational and passenger activity levels between the two years. Similarly, the lower emissions in 2022 when compared to 2019 are due to the lower operational and passenger activities in 2022. • Total Logan Airport GHG emissions in 2022 are less than 1 percent of the most recent statewide total emissions estimates (See Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Table 8-9). • GHG emissions from sources directly controlled by Massport, include Massport-owned facilities, equipment, and purchased electricity. The Authority will continue to influence areas Massport does not have control over such as tenant owned GSE, rental car facilities, taxis/RideApp services, sustainable aviation fuel (SAF) usage, etc.
A-54	EEA Secretary Certificate	Air Quality and Emissions Reductions	Provide projections for GHG emissions over the next five years and through 2040, based on the projected activity levels surveyed as indicated above. Compare these projections to historical levels as set forth in prior ESPRs.	The 2022 ESPR provides GHG projections based on forecasted activity levels over the Future Planning Horizon of 10 to 15 years, and Massport will continue to update these projections and forecasts every 5 years going into the future as part of the ESPR process. In addition to providing 2022 data analyses, comparisons to 2019 pre-COVID-19 data, and projections and forecast data through the Future Planning Horizon, Massport has also included frame of reference "baseline" years that will be used to benchmark comparisons and forecasts going forward. GHG emissions are discussed in Chapter 8, *Air Quality and Greenhouse Gas Emissions,* Section 8.4.3.

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A-55	EEA Secretary Certificate	Air Quality and Emissions Reductions	Describe all efforts by Massport to reduce GHG emissions during 2022 and the years since the last ESPR, and quantify reductions associated with those initiatives to the extent feasible. To the extent efforts were deferred, the ESPR should clearly track the anticipated emissions benefits associated with such initiatives, and ensure that those reductions are not credited in the future projections provided for the relevant reporting period.	Massport remains committed to implementing emissions reduction strategies identified in previous EDR and ESPR publications, including those documented in Chapter 8, *Air Quality and Greenhouse Gas Emissions,* Section 8.5 and in Chapter 10, *Project Mitigation*.
A-56	EEA Secretary Certificate	Air Quality and Emissions Reductions Sustainability and Resiliency	Provide a status update that reports on progress made towards achieving Massport's Net Zero goal for emissions under its control.	In 2021, Massport prepared the *Net Zero Roadmap by 2031*, the goal of which is to strive to reach net zero GHG emissions by 2031, Massport's 75th anniversary. The 2022 ESPR reports on the implementation of that program in Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.1.1.
A-57	EEA Secretary Certificate	Air Quality and Emissions Reductions	Continue to provide an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The 2022 ESPR should also provide discussion of progress on national and international levels to decrease air emissions.	Chapter 8, *Air Quality and Greenhouse Gas Emissions*, provides updated information regarding the following: • Logan Airport is in the Boston Metropolitan Area. In accordance with the Clean Air Act (CAA), all areas within Massachusetts are designated as either attainment, nonattainment, or attainment and maintenance with respect to the National Ambient Air Quality Standards (NAAQS). The regulatory designations for the Boston Metropolitan Area as of the publication of this ESPR are listed in Appendix J, *Air Quality and Greenhouse Gas Emissions Supporting Documentation,* Table J-4. As shown, the area is designated to be in attainment of all pollutants, except for carbon monoxide (CO), which it is designated to be in maintenance. • The AEDT noise and air quality model was released in 2015 and is FAA's approved computer model for calculating emissions from aircraft-related sources. As discussed in Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.2, the FAA's AEDT model was used. The latest version of AEDT at the time of the 2020-2021 EDR emission estimates was AEDT 3d, which was released in March of 2021. The version of AEDT that was used to model 2022 data was AEDT version 3e, released on May 9, 2022. • Regarding international initiatives, the 2022 ESPR will discuss updates from the International Civil Aviation Organization (ICAO), ACI, and the Intergovernmental Panel on Climate Change (IPCC). Nationally, updates from the U.S. Environmental Protection Agency (U.S.EPA) and FAA will be discussed and included in the 2022 ESPR.

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A-58	EEA Secretary Certificate	Air Quality and Emissions Reductions	Continue to use the latest version of FAA's AEDT model for air emissions modeling as was presented in the 2020/2021 EDR. The EPA Motor Vehicle Emission Simulator (MOVES) tool should continue to be used to assess vehicular emissions on airport roadways.	As described in Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.2 Massport used the FAA's AEDT for air quality modeling of aircraft-related emissions and aircraft noise modeling. Consistent with past practice, the version of AEDT that is current at the inception of the study AEDT version 3e, released on May 9, 2022, was used to model 2022 data. The most recent version of the U.S.EPA Motor Vehicle Emission Simulator (MOVES) version 3.1, released in November 2022 was used to estimate motor vehicle emissions on airport roadways.
A-59	EEA Secretary Certificate	Air Quality and Emissions Reductions	Include a mobile sources emissions inventory for CO, NOx, VOCs, and PMs. It should also report on Massport and tenant alternative fuel vehicle programs and the status of Logan Airport air quality studies undertaken by Massport or others, as available	Mobile source emissions inventories, including tenant alternative fuel vehicles as shown in Chapter 8, *Air Quality and Greenhouse Gas Emissions,* Table 8-15, were included in the 2020 and 2021 EDR and will also be included in the 2022 ESPR. Refer to Response to Comment A-53 for more information. As part of Massport's *Roadmap to Net Zero by 2031* initiative, it is working on fleet and equipment decarbonization for Massport facilities and supporting tenant's efforts to reduce GHG emissions. Progress will be reported in forthcoming EDRs and ESPRs. The status of air quality studies on topics including UFP, BC, local public health impacts, etc., will continue to be reported and discussed, as described in Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5. The Response to Comment A-6 provides a more detailed description of on-going air quality studies undertaken by Massport as well as other academic and research institutions In addition, a EJ and Public Health Existing Conditions Review has been included in the 2022 ESPR to assess the existing environmental and health conditions currently experienced by the Airport's surrounding communities, including Environmental Justice (EJ) communities. See Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4 and Section 2.5. As part of the 2022 ESPR, Massport conducted an idling and dwell time study to update the vehicle dwell time information for the Terminal A arrivals and departure curbs across all modes, and Terminal B buses. The study focused on Terminal A, which was assumed to be a suitable proxy for the other terminals given the limitations associated with the on-going construction at Terminals B, C, and E during the course of the study. The study included in-person observations of the cell phone lot to determine the extent which vehicles were dwelling with engines running, or idling. Massachusetts General Law (MGL) requires vehicles to shut off engines when stationary or parked for more than five minutes. Massport has enforcement mechanisms in place at the taxi, RideApp, bus, and limo pool areas, therefore dwelling vehicles were not observed at these locations. The study provided updated input data, which was used to complete the ground access and air quality modeling of current and future forecasted conditions for the 2022 ESPR, and this information was integrated into the relevant discussion sections of Chapter 6, *Ground Access*, Section 6.5 and

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				Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.2.1. As construction at the other terminal curbs are completed, Massport will conduct idling and dwell time studies at those locations and report on findings in the next EDRs or ESPRs.
A-60	EEA Secretary Certificate	Activity Levels Ground Access	Demonstrate that Massport's programs to maintain and increase HOV modes provide the capacity to meet demand associated with growth as passenger activity levels and airport operations fully recover from the COVID-19 pandemic.	Chapter 6, *Ground Access,* Section 6.5, documents the current status of the HOV program and predicts the future anticipated HOV share, which also captures the forecasted demand. As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, and projects are prioritized based on passenger needs and user demand. Massport has restored much of the Logan Express service that was temporarily reduced in March 2020. In addition, Massport has relocated the underperforming Peabody service to a location at the North Shore Mall that has much better access. The North Shore Mall location is intended to rebuild and expand HOV ridership from the north. Massport continues to evaluate other urban and suburban locations. Massport reopened the Woburn, and Back Bay Logan Express service in October 2022. Headways for the Braintree and Framingham Logan Express service were restored in 2021. The 1,000-parking space expansion at Framingham Logan Express is in design phase and is expected to break ground in 2024. Additionally, a feasibility study is underway at the time of this filing for a new Logan Express urban location. Chapter 4, *Airport Planning*, Section 4.1 provides a status on these deferred projects as well as information on how each line of service is performing.
A-60	EEA Secretary Certificate	Activity Levels Ground Access	Demonstrate that Massport's programs to maintain and increase HOV modes provide the capacity to meet demand associated with growth as passenger activity levels and airport operations fully recover from the COVID-19 pandemic.	Chapter 6, *Ground Access*, Section 6.5 describes how Massport's programs maintain and plan to increase HOV modes to support changes in demand. As passenger levels recover towards 2019 levels, Massport continues to evaluate and plan for the recovery of air passenger activity and the resulting use of HOV modes. Massport remains committed to implementing the broad range of ground access strategies to promote widespread HOV use, which are outlined throughout the chapter. The current status of air passenger activity levels, recovery trends, and planned improvements to accommodate future passenger needs are detailed in Chapter 4, *Airport Planning*, Section 4.1 Massport assessed mode share data from the 2022 Air Passenger Ground Access Survey, which showed the effects of the pandemic on passenger choices in travel to and from the Airport, with private automobiles transporting passengers that previously accessed the Airport via HOV, RideApp-based services, or taxis. Massport intended to meet or exceed a 35.5 percent HOV mode share by 2022 and 40 percent by 2027. Based on the results of the 2022 Air Passenger Ground Access Survey, the 2022 HOV mode share objective was not only met, but exceeded, and Massport is on track to meet planned 2027 HOV mode share objectives.

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A-61	EEA Secretary Certificate	Air Quality and Emissions Reductions	Quantify the emissions reductions associated with Massport's air emissions/GHG reduction initiatives to the extent feasible.	Massport's air quality and GHG management strategy for Logan Airport focuses on decreasing emissions from Airport related sources, in addition to furthering innovative means to achieve emissions reductions Airport wide. Massport's air quality and GHG improvement goals, the measures proposed to accomplish them, and some of the 2022 milestones are listed in Chapter 8, *Air Quality and Greenhouse Gas Emissions,* Table 8-13. In this table, fuel volumes are provided for initiatives where traditional fossil fuel vehicles or equipment have been converted to electric vehicles as a proxy estimation on GHG emissions reductions. Chapter 6, *Ground Access*, Section 6.3 reports on HOV mode shares and ridership correlated to VMT, which helps to quantify emissions reductions for trips to and from the airport. Massport continues to comply with the Logan Airport Parking Freeze, in accordance with 10 Code of Massachusetts Regulations 7.30 and 40 Code of Federal Regulations 52.1135. Chapter 6, *Ground Access*, Section 6.4.1 provides detailed discussion of Massport's compliance with the Parking Freeze regulation, and the counterproductive effect of constrained parking at Logan Airport on VMT and associated emissions. Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Table 8-10, provides GHG data for Logan Airport from 2017 through 2022 by scope and compares the emissions to statewide totals, in metric tons (MT) of CO2e.
A-62	EEA Secretary Certificate	Air Quality and Emissions Reductions	Include data on Diesel PM to the extent such data are available.	The 2022 ESPR includes the latest information and research on diesel particulate matter (PM). Chapter 8, *Air Quality and Greenhouse Gas Emissions,* Table 8-7 and Figure 8-7 show the PM10/PM2.5 contribution for each emission source and by source category for the years 2017 through 2022, respectively. Chapter 8, Figure 8-7 shows the long-term trend in PM10/PM2.5 emissions associated with Airport activities. Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Figure 8-8 presents the PM10/PM2.5 breakdown by source category for 2022. Stationary source emissions of PM10/PM2.5 increased in 2022 compared to 2021 due to an increase in stationary source activity levels. The PM10/PM2.5 emissions from stationary sources and other non-mobile sources in 2022 are higher than 2019 levels. These sources include snowmelters, boilers, emergency generators, space heaters, and fire training activities. While there is a lower use of ultra-low sulfur diesel (ULSD) and natural gas for the boilers in 2022, there was an increase in emergency generator hours due to maintenance activities in 2022 compared to 2021.

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				Since 2011, Massport has voluntarily installed diesel particulate filters on all large (i.e., over 500 kilowatts) stationary emergency generators. All large construction projects, heavy construction equipment is required to be equipped with diesel particulate filters or diesel oxidation catalysts in accordance with Clean Air Construction Initiative (CACI). Massport is required to use ULSD fuel in all Massport snow melting equipment. Massport installed two new stationary snow melters using natural gas in 2016 and two additional snow melters became operational in December 2019. These installations will reduce the need for ULSD fuel fired portable snow melters. In 2020, one new ULSD portable snow melter was added to the fleet.
A-63	EEA Secretary Certificate	Air Quality and Emissions Reductions	The 2020/2021 EDR indicates that Massport is cooperating with Boston University and Tufts University in identifying aircraft specific related UFPs in an urban environment with nonairport related sources. This research is on-going in the East Boston area and Massport continues to contribute by providing Logan Airport operational and other pertinent data. Provide a more detailed update on the study and how findings may relate to Massport operations and a potential framework for community mitigation.	Massport continues to work with FAA, research institutions like MIT, Boston University, and Tufts University to expand research including on UFP. **Chapter 8, *Air Quality and Greenhouse Gas Emissions***, provides an update on Massport's on-going collaboration and evolving service strategy with the MassDPH and EBNHC. **Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.2** provides an overview of measures Massport takes to avoid, minimize, and offset the environmental effects of airport operations. In addition, an EJ and Public Health Existing Conditions Review has been included in the 2022 ESPR to assess the existing environmental and health conditions currently experienced by the Airport's surrounding communities, including Environmental Justice (EJ) communities. See **Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4** and **Section 2.5**. The assessed conditions are derived from regional sources and are not associated with one specific entity or activity.
A-64	EEA Secretary Certificate	Air Quality and Emissions Reductions	The 2022 ESPR should include updates on the status of these collaboration efforts. The 2022 ESPR should continue to report on engagement with the Health Center and include a discussion of how the services provided directly to and through the Health Center (which are funded by Massport) can be expanded.	Massport has renewed an agreement to provide funding to the EBNHC to help expand the efforts of its Asthma and COPD Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits, and other efforts. Massport will continue to engage with the Health Center to identify additional opportunities to provide additional support. EBNHC's Asthma and COPD Home Visiting Program funded by Massport is a no-cost program for patients with uncontrolled asthma or COPD. Through the program, trained community health workers help patients learn to address asthma or COPD triggers at home, reduce asthma or COPD symptoms, and correctly use asthma or COPD medications. Eligible participants receive four home visits over a six-month period.

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A-65	EEA Secretary Certificate	Air Quality and Emissions Reductions	Consult with community-based organizations about potential approaches to further mitigate air quality impacts in light of growth trends and emerging research on the impacts of airport operations on public health. Describe a decision making process that Massport intends to follow to determine what, if any, additional public health contributions would be considered, and how Massport would seek to fund such contributions.	Massport continues to work with CBOs to collaboratively determine how to advance strategies for reducing Logan Airport-related impacts and will continue to support opportunities to advance research on public health impact data, including noise and air emissions. Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5 provides an update on Massport's on-going collaboration and evolving service strategy with the MassDPH and EBNHC. • Massport continues to monitor public health studies related to airport activities around the nation, As described in Chapter 7, *Noise,* Section 7.2, Massport collaborates with academic institutions regarding research related to public health including MIT, Boston University, and Tufts University providing data for relevant studies. Based on the outcome of those studies and other science-based research, Massport determines the appropriate method to implement recommendations. Massport, in collaboration with MIT and FAA, began a first-of-its-kind project in September 2016 to identify strategies for noise reduction through changes to PBN and flight performance modifications, addressing community concerns. The technical work was completed in 2022. Recommendations have been implemented or are being implemented. • Massport has supported the Boston University and Tufts University FAA-affiliated ASCENT research to evaluate the impact of aviation emissions on air quality in communities surrounding Logan Airport. These studies, began in 2017 building on research related to highway emissions, studies at other major airports. The effort involved monitoring UFP and other pollutants at four sites around Logan Airport and developing statistical methods to determine aviation's contribution to air pollution. The outcomes aim to provide estimates of the magnitude and spatial extent of aviation source concentrations, validate dispersion model levels of nitrogen dioxide (NO2) and sulfur dioxide (SO2), and assess the public health impacts of aviation-related air pollution. Locations of monitors are shown in Appendix J, *Air Quality and Greenhouse Gas Emissions Supporting Documentation*, Figure J-5. Findings will be reported in future EDRs and ESPRs. • Olin College, AIR, Inc., and Aerodyne have collaborated to monitor air quality in Winthrop. Massport has supported this study by providing operational data as needed. Massport is available to provide additional data and input. Locations of monitors are shown in Appendix J, Figure J-5. • In 2022, Tufts University conducted a study which evaluated changes in UFP concentrations near Logan Airport during the COVID-19 pandemic in relation to mobility reductions. The study found that that on average particle number concentrations were lower during the first three months of the state-of-

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				emergency phase than before the pandemic, consistent with reduced flight activity and traffic volume. Locations of monitors used in the study are shown in Appendix J, Figure J-5. • In 2022, Boston University conducted a study which evaluated the impact of arrival aircraft on UFP concentrations, using PNC as a proxy, across six sites near Logan Airport. The study found that that arrival aircraft contributes significantly but intermittently to ambient PNC in nearby communities, with a during high aircraft activity hours. Locations of monitors used in the study are shown in Appendix J, Figure J-5. • As part of Massport's broader NetZero plan, in early 2022, Massport collaborated with the Massachusetts Clean Energy Center (MassCEC) to study opportunities to convert the RideApp fleet (such as Uber and Lyft) serving Logan International Airport to electric vehicles, with MassCEC providing a grant to initiate this work and fund Logan's EV charging infrastructure. • In 2020 and 2021, MIT and the Center for Air Transportation Systems Research utilized data from Massport to study single engine taxiing. Applying MIT's methodology to Logan Airport operational data showed a savings of approximately 1,006,824 gallons of jet fuel in 2020 and 1,315,105 gallons in 2021 due to single engine taxiing, reducing greenhouse gas (GHG) emissions. • In 2020, Tufts University carried out a study on the impacts of aviation emissions on residential air quality near Logan Airport, finding that pollutant concentrations were higher when the residence was downwind. Locations of monitors used in the study are shown in Appendix J, Figure J-5. • In 2006, 2009, and 2010, Massport conducted surveys to understand the extent of single engine taxiing at Logan Airport and supported a more detailed survey by MIT in 2009. The surveys found that single engine taxiing is an important measure used by airlines to conserve fuel. • Between 2004 and 2014, MassDPH conducted a health impact assessment of Logan Airport, focusing on noise and air quality. Massport supported this study by providing funding, operational data, and technical assistance. Massport responded to the MassDPH study recommendations by funding the EBNHC in 2015 to expand their Asthma and COPD Prevention and Treatment Program. Massport continues to fund this effort.

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A-66	EEA Secretary Certificate	Air Quality and Emissions Reductions	Describe the [public health] research efforts that Massport will fund or collaborate on, and how such efforts will be identified.	Massport continues to work with FAA and research institutions like MIT, Boston University, and Tufts University to expand research including on UFP and BC. Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5, provides an update on Massport's on-going collaboration and evolving service strategy with the MassDPH and EBNHC. Studies include those described in the Response to Comment A-6. In addition, Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.2 provides an overview of measures Massport takes to avoid, minimize, and offset the environmental effects of airport operations. In addition, an EJ and Public Health Existing Conditions Review has been included in the 2022 ESPR to assess the existing environmental and health conditions currently experienced by the Airport's surrounding communities, including Environmental Justice (EJ) communities. See Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4 and Section 2.5. The assessed conditions are derived from regional sources and are not associated with one specific entity or activity. Massport used publicly available data sets produced by EEA, MassDPH, U.S.EPA, MEPA, and other agencies to assess existing environmental and health burdens in surrounding communities. The methodology and summary of results from this assessment are presented in Chapter 2, *Sustainability, Outreach, and Environmental Justice*.. Applicable chapters will reference the assessment and briefly discuss the assessments results in context, where appropriate. Massport will continue conversations with MEPA and community stakeholders to refine this process, as feasible, in future iterations of the EDR/ESPR.
A-67	EEA Secretary Certificate	Water Quality	The 2022 ESPR should identify any planned stormwater management improvements and report on the status of: • NPDES Permit and monitoring results for Logan outfalls and the Fire Training Facility; • Jet fuel usage and spills; • MCP activities; • Tank management; • Update on the environmental management plan; and • Fuel spill prevention.	Chapter 9, *Water Quality*, reports on each of the topics listed as directed by the Secretary for Energy and Environmental Affairs. Monitoring results, spills reporting data, Massachusetts Contingency Plan (MCP) activities, and other quantified parameters are reported in Appendix K, *Water Quality Supporting Documentation*. Highlights and updates on the implementation of the Environmental Management Plan are provided in a summary table at the beginning of the chapter.
A-68	EEA Secretary Certificate	Responses to Comments	The Response to Comments section should address all of the substantive comments on the 2020/2021 EDR, and other Certificates for Logan Airport that reference EDR/ESPR documentation	The Certificate on the *20/21 EDR* is included within this Appendix in addition to the responses to comments matrix included here as well. The Certificate on the Logan Airport Parking Projects notes that "Massport will continue to report on its environmental data annually to MEPA, including the status

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			(e.g., Logan Airport Parking Project (EEA# 15665), Terminal E Modernization (EEA# 15434)).	of Section 61 Findings, through the EDR / ESPR process, which information will also be provided to Conservation Law Foundation (CLF). Massport will include in the annual EDR I ESPR submissions, reports on Massport's progress on the commitments set forth in this Agreement". The Parking Project is not yet under construction, however, the framework for reporting on the project mitigation commitments is outlined in Chapter 10, *Project Mitigation*, Section 10.9. Phase 1 of the Terminal E Modernization Project officially opened in November 2023. The status of project mitigation is described in Chapter 10, *Project Mitigation*, Section 10.8. The Certificate on the Terminal E Modernization Project notes that the MEPA Director is "aware that Massport and the FAA recently signed a Memorandum of Understanding (MOU) to frame a new process for analyzing opportunities to incrementally reduce noise through changes or amendments to Performance Based Navigation, including RNAV procedures. I commend Massport and the FAA for establishing this agreement, which is a unique project between the FAA and an airport operator. Massport has indicated that this process will incorporate community outreach and public input. I expect that updates on this process will be provided in in future ESPRs and EDRs which will provide an additional forum and meaningful opportunities for public review of information related to these issues". See Chapter 7, *Noise*, Section 7.4, for more information. The Certificate on Terminal E Modernization also notes that "The 2015 EDR and 2016 ESPR should reflect the proposed connection to Airport Station, provide updates on the planning and design of the connection, and identify the anticipated ridership, changes in the HOV mode share, and ground access planning considerations." As documented in Chapter 4, *Airport Planning*, Section 4.3, Phase II of the Terminal E Modernization Project, which includes a connection to Airport Station, is currently on hold. When Phase II comes online, the parameters will be reported in the applicable EDR or ESPR. Copies of the Certificates on the Logan Airport Parking Project and Terminal E Modernization Project are included in Appendix A, *MEPA Certificates and Responses to Comments*.
A-69	EEA Secretary Certificate	Responses to Comments	Include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and will not be construed to, enlarge the scope of the 2022 ESPR beyond what has been expressly identified in this Certificate. The Response to Comments should not reference a section of the 2022 ESPR	A copy of the Secretary's Certificate on the 2020/2021 EDR issued on January 30, 2023, and responses to the comments received in the Secretary's Certificate, are included in Appendix A, *MEPA Certificates and Responses to Comments*. A copy of the Secretary's Certificate on the 2020-2021 EDR, each comment letter received on the 2020-2021 EDR, and responses to the comment are in Appendix B, *Comment Letters and Responses to Comments*.

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			unless they are directly responsive to the comment.	
A-70	EEA Secretary Certificate	Responses to Comments	Common themes that should be addressed throughout the 2022 ESPR and in the Responses to Comments include mitigation for air quality impacts (and the findings and relevance of UFP research being performed by Tufts University and Boston University), noise abatement, and traffic reduction measures.	This 2022 ESPR follows the requirements of the Secretary's Certificate on the 2020-2021 EDR, issued January 30, 2023. Chapter 8, *Air Quality and Greenhouse Gas* Emissions, Section 8.5, includes a discussion of mitigation associated with air quality, and updated information regarding recent and on-going research on airport emissions, including on UFP, by institutions like Boston University and Tufts University to look for ways to reduce effects. Chapter 7, *Noise*, Section 7.4, includes an update on the Massport *Noise Abatement Plan* and associated measures to reduce airport-related noise effects. In 2022 the Logan Airport Noise Monitoring System was upgraded and Massport applied to the FAA for additional sound insulation funding. Chapter 6, *Ground Access*, Section 6.5, includes a description of measures to reduce traffic to and from Logan Airport through a comprehensive HOV Program, VMT reduction strategies, and physical infrastructure improvements at the Airport. Chapter 10, *Project Mitigation*, includes detailed status updates for all active projects that are subject to Section 61 Findings commitments and the status of mitigation efforts planned, underway, or completed as of 2022. The Runway 27 Runway Safety Area Improvement Project, which has construction planned within the near future, was added to Chapter 10, *Project Mitigation*, Section 10.10.
A-71	EEA Secretary Certificate	Mitigation Content	Include information to clarify and refine the process for estimating growth rates and provide more detailed data on the implementation of deferred mitigation projects aimed at addressing impacts. The 2022 ESPR should consider alternative methods of presenting and explaining data and findings that are accessible and understandable to all readers.	Chapter 3, *Activity Levels and Forecasting*, of this 2022 ESPR describes methodology for future forecasting and including future forecast growth. Massport follows industry best practices for forecasts and considers several factors including economic conditions; airplane manufacturers' plans; future forecast aircraft in the fleet mix; social factors; and anticipated airline route plans. Additional explanation on forecasting methodology is provided in Chapter 3, *Activity Levels and Forecasting*, Section 3.4, and Appendix F, *Activity Levels Supporting Documentation*. To improve presentation of complex information, the description of the forecasting methodology is enhanced with graphics, tables and icons. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 discusses the status and approach of deferred capital projects. Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity levels increase. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line.

#	Author	Topic	Comment	Response
				COVID-19 deferred projects were largely associated with actions to accommodate projected growth rather than solely aimed at reducing impacts from existing activities. As passenger activity recovers, and impacts from those additional activities grow, Massport restores service and restarts select postponed projects. Updates on projects deferred due to the COVID-19 pandemic are as follows: • **Postponed Terminal E Improvement Phases 1 and 2**: Terminal E Phase 1 opened in October 2023, and the next phase to add four new gates is currently in conceptual planning process. • **Postponed Parking Garage in front of Terminal E**: Permitted for up to an additional 5,000 spaces, the project has resumed and currently in preliminary design phases. • **Suspended Logan Express service** from Peabody, Woburn, and Back Bay: Services restored in 2022. • **Logan Express headways** reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and the new Quincy lot is helping to increase passenger capacity at Braintree in addition to the parking expansion at Framingham, which is also helping to improve passenger use. • **Postponed construction of additional parking** at Framingham Logan Express: Project has resumed and is in the design phase with construction currently estimated to begin in 2024. • **New Logan Express suburban location**: Peabody Logan Express at new North Shore location opened in 2022. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing Back Bay Logan Express. Danvers Logan Express is expected to open towards the end of 2024. • **Dedicated HOV bus lanes**: HOV prioritization initiatives, including HOV bus lanes, are underway throughout Logan Airport campus.
A-72	EEA Secretary Certificate	Schedule	I encourage Massport to target early 2024 for filing of the 2022 ESPR.	Due to the additional feedback from EEA and reviewers regarding additional outreach and format of the ESPR, the targeted filing date for the 2022 ESPR was extended out by 3 months. The *2022 ESPR is* expected to be filed on **May 31, 2024**.

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Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the *Logan Airport 2018/2019 Environmental Data Report (EDR)*

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The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
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March 19, 2021

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
2018/2019 LOGAN AIRPORT ENVIRONMENTAL DATA REPORT

PROJECT NAME	: 2018/2019 Environmental Data Report (EDR)
PROJECT MUNICIPALITY	: Boston/Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: January 6, 2021

As Secretary of the Executive Office of Energy and Environmental Affairs (EEA), I hereby determine that the Environmental Data Report (EDR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA) (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

The environmental review process for Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of the Massachusetts Port Authority's (Massport) long-range planning process. The ESPR provides a "big picture" analysis of the environmental impacts associated with current and projected activity levels, and presents a comprehensive strategy to avoid and minimize impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific Environmental Impact Reports (EIRs). The ESPR is generally updated on a five-year basis. The previous ESPR for the year 2017 (2017 ESPR) was filed in August of 2019. The Certificate on the 2017 ESPR was issued on November 25, 2019 and included a Scope for this 2018/2019 Environmental Data Report (EDR).

EDRs are filed in the years between ESPRs. The EDR is a retrospective document that is filed annually and identifies environmental impacts based on actual passenger activity and operations. This 2018/2019 EDR follows the 2017 ESPR. In the 2017 ESPR, Massport requested to combine both the 2018 EDR and the 2019 EDR into one document referred to as the 2018/2019 EDR. The 2018/2019 EDR is the subject of this review. This Certificate also contains a Scope for the next EDR.

The 2018/2019 EDR indicates that the strong economy resulted in a rapid increase in passenger activity levels and aircraft operations during 2018-2019. In 2019, air passenger activity levels at Logan Airport reached an all-time high of 42.5 million, an increase of 3.9 percent over 2018 (40.9 million). If this trend continues, the Airport will likely exceed the 50 million annual passengers much sooner than the 10 to 15 year timeframe projected in the 2017 ESPR. To provide additional context, the 2018/2019 EDR also includes an update through fall 2020 to acknowledge the decrease in passenger activity and passenger operations that occurred in 2020 as a result of the COVID-19 pandemic. Specifically, the 2018/2019 EDR details how beginning in March 2020, flights in and out of Logan Airport were dramatically reduced and passenger levels dropped by over 90 percent at the peak of the COVID-19 pandemic in the spring and summer of 2020. While activity levels began a slow recovery in mid-summer 2020, the ongoing wave of COVID-19 cases has resulted in a decrease in total flight operations by approximately 50 percent and passenger levels by approximately 70 percent compared to January through October 2019. The 2018/2019 EDR predicts that it will be years before operations at the Airport return to pre-COVID-19 levels. While I understand that future growth at Logan Airport will be impacted by public health guidance and post-pandemic economic recovery, comments from the Conservation Law Foundation (CLF), Airport Impact Relief Incorporated (AIR Inc.), the Town of Milton, and others request that Massport refine its process for forecasting growth rates and provide additional data to support the estimates. While activities and operations have decreased due to the COVID-19 pandemic, the next EDR should describe the methodology for the forthcoming future forecast which should be provided in the 2022 ESPR. Additionally, I am requiring that Massport file a combined 2020/2021 EDR given that 2020 activity levels, if considered in isolation, would not provide a clear and complete indication of post-pandemic growth trends. I expect that Massport will continue their ongoing consultation and share data regarding observed trends with the Massport Community Advisory Committee (CAC) and other stakeholder groups as these documents are being developed.

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Although not required as part of the Scope, the 2018/2019 EDR also provides updates through fall 2020 where the current conditions have resulted in changes to planned capital projects or programs that were in place in 2018 and 2019 or were planned to occur in the near future. As described in the 2018/2019 EDR, these changes are a result of changes to capital and operations plans that have occurred in recognition of the dramatic reduction in flights, passenger levels, and revenue caused by the ongoing COVID-19 pandemic. The changes primarily include the deferral of several planned capital projects that would provide environmental benefits and reduce impacts associated with airport operations as activity levels recover, including but not limited to: the Logan Airport Parking Project (EEA# 15665) (5,000 new parking spaces, solar photovoltaic system, and electric vehicle charging stations), Phase 2 of Terminal E Modernization (EEA# 15434) (3 new terminal gates), several high-occupancy-vehicle investments (addition of 1,000 new spaces to Framingham Logan Express Garage (EEA# 16168), opening a new Logan Express suburban location, and implementing a 2nd urban Logan Express Service at North Station. I note comments from CLF, AIR Inc., the Massachusetts Chapter of the Sierra Club, and Mr. Frederick Salvucci identify concerns that the 2018/2019 EDR does not present a decision making process or timeline regarding future implementation of the deferred capital projects. As noted below, I expect that the 2020/2021 EDR will include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. The EDR should also include a description of the economic, financial, or other factors that will inform this decision. As noted above, I encourage Massport to continue their ongoing consultation with the Massport CAC and other stakeholder groups as this process is developed. A-4

Comments also request that Massport present more direct information about the major research findings around health and airport impacts, including likely pollution and noise health impacts, and identify mitigation commitments to reduce these impacts. In addition to responding to these comments, the 2020/2021 EDR should report on the progress and other refinements for tracking noise, traffic, and air emissions and abatement efforts, as further described in the Scope below. A-5 While Massport has followed through on several important commitments despite these uncertain conditions, providing environmental mitigation commensurate with impacts remains critical as the economy recovers and demand for air travel increases. The 2020/2021 EDR should document potential impacts and trends and propose measures to avoid, minimize and mitigate environmental impacts. A-6 While I acknowledge that the next EDR will depict a decrease in passenger growth and aircraft operations due to the COVID-19 pandemic; I expect that future EDRs will include additional information if actual growth in passenger and/or aircraft operations outpace the forecasts, including a discussion of passenger and activity levels and planning/mitigation to address impacts of the growth. Furthermore, I continue to reserve the right to require that future ESPRs evaluate the impacts of a range of activity forecasts, based on the results of the interim reporting provided in the EDRs.

Logan Airport Environmental Review and Planning

The 2018/2019 EDR is generally responsive to the Scope. It contains useful data on activity levels and impacts, and lays out a forecast for trends in the future years. The technical studies in the 2018/2019 EDR include reporting and analysis of key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking.

As noted above, the 2017 ESPR presented an updated forecast for Logan Airport aircraft operations and passenger activity. That forecast focused on a Future Planning Horizon including projections of 50 million annual air passengers and 486,000 annual aircraft operations. As presented in the 2018/2019 EDR, the strong economy caused a rapid increase in passenger activity levels and aircraft operations during 2018-2019. Through 2019, Logan Airport was one of the fastest growing large airports in the United States in terms of passenger volume. From 2017 to 2019, U.S. air passenger traffic grew by 9.1 percent, whereas Logan Airport experienced a passenger growth of 10.7 percent over the same time period.

In 2019, air passenger activity levels at Logan Airport reached an all-time high of 42.5 million, an increase of 3.9 percent over 2018 (40.9 million). As has been the recent trend prior to March 2020, aircraft operations increased at a slower rate than passengers. In 2019, aircraft operations totaled 427,176 and in 2018, aircraft operations totaled 424,024. These levels both represent increases compared to the 2017 passenger levels of 38.4 million and 401,371 operations. The 2018/2019 EDR asserts that the growth observed during 2018 and 2019 was directly correlated to the strong national and regional economies. However, even with this strong growth, aircraft operations remained well below the 487,996 operations in 2000 and the historic peak of 507,449 operations reached in 1998. The 2018/2019 EDR concludes that the slower growth in aircraft operations compared to passenger levels remains due to the steady increase in aircraft size and improving aircraft load factors (passengers/available seats). As noted above, the 2018/2019 EDR also describes how the COVID-19 pandemic has significantly reduced airport operations and passenger growth in 2020 and predicts that it will be years before operations at the Airport return to pre-COVID-19 levels.

This 2018/2019 EDR focuses on: (1) rapidly growing domestic and international passenger demand; (2) the increase in use of transportation network companies (TNC), such as Uber and Lyft, to Logan Airport and subsequent effects; (3) airport-wide emissions including those associated with vehicle trips; (4) use of the Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) for noise and air quality modeling; and, (5) noise abatement strategies.

Massport began collecting TNC data in 2017 when TNCs were authorized to pick up customers from the airport. The 2018/2019 EDR provides data and identifies effects of TNCs on traffic flow and congestion, and provides an assessment of ground access trends. Massport committed to a goal of 35.5 percent high occupancy vehicle (HOV) mode share goal by 2022 and 40 percent by 2027. Based on the results of the 2019 Air Passenger Ground-Access Survey, HOV mode share has reached 40.4 percent, exceeding both near-term and longer-term goals. The 2018/2019 EDR provides updates on the FAA requirements for changes to area navigation (RNAV) procedures introduced in the 2017 ESPR. The RNAV program has been implemented throughout the country and its primary purpose is to increase safety and operational efficiency. As noted in prior MEPA review documents, the implementation of several of these procedures has resulted in concentrations of flight patterns over certain communities and significant increases in noise exposure. The impact of the RNAV program is emphasized in comment letters received on the 2018/2019 EDR and the 2017 ESPR. Massport and the FAA signed a Memorandum of Understanding (MOU) in 2017 to frame a new process for analyzing opportunities to incrementally reduce noise through changes or amendments to Performance Based Navigation (PBN), including RNAV procedures. The 2018/2019 EDR provides an update on this process and describes Massport's efforts to mitigate noise exposure and impacts. Massport continues to seek funding for noise mitigation for properties that are eligible for participation in its Residential Sound Insulation Program (RSIP). In 2019, Massport updated its RSIP Noise Exposure Map contours and submitted an AEDT-derived noise exposure map to the FAA in 2020 for review and discussion.

The 2018/2019 EDR provides information on noise conditions modeled using the latest FAA noise modeling software, the AEDT. Massport transitioned to AEDT from the Integrated Noise Model (INM) in its 2016 EDR. The 2018/2019 EDR also uses FAA's AEDT model for emission factors compared to the legacy Emissions and Dispersion Modeling System (EDMS) model. Massport attributes some of the changes in air emissions to the use of the AEDT model, which assumes higher nitrogen oxides emission factors compared to the legacy EDMS model.

Review of the 2018/2019 EDR and Scope for the 2020/2021 EDR

The 2018/2019 EDR identifies the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts; analyzes trends and environmental impacts of operations in calendar year 2018 and 2019; and provides updates on projects, environmental management plans, and the status of project mitigation. As noted above, Massport has also included updates through fall 2020 in the 2018/2019 EDR where the current conditions have resulted in changes in projects or programs that were in place in 2018 and 2019. As noted above, I am requiring that Massport file a combined 2020/2021 EDR to provide a clear and complete indication of post-pandemic growth trends.

The 2020/2021 EDR must include information on the environmental policies and planning that form the context of environmental reporting, technical studies, and environmental mitigation initiatives against which projects at Logan Airport can be evaluated. This should include identification of the cumulative effects of Logan Airport operations and activities. A-7 The results of the Logan Airport Air Passenger Ground Access Survey and the Long-term Parking Management Plan should inform transportation planning and strategies to achieve the HOV mode share goal. A-8

The 2020/2021 EDR must include copies of all ESPR and EDR Certificates and a distribution list (indicating those receiving documents, CDs, or Notices of Availability). Supporting technical appendices should be provided as necessary. A-9

Response to Comments

The Response to Comments section should address all of the substantive comments on the 2018/2019 EDR, and other Certificates for Logan Airport that reference EDR/ESPR documentation (e.g. Logan Airport Parking Project (EEA# 15665), Terminal E Modernization (EEA# 15434)). To ensure that the issues raised by commenters are addressed, the 2020/2021 EDR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the EDR beyond what has been expressly identified in this Certificate. A-10 The Response to Comments should not reference a section of the EDR unless they are directly responsive to the comment. Common themes that should be addressed throughout the EDR and in the Responses to Comments include noise (modeling of noise contours and noise abatement) and emissions reduction issues. The EDR should also include sufficient information to address comments on air quality and public health which are common concerns of commenters. A-11

Activity Levels

Air traffic activity levels at Logan Airport are the basis for the evaluation of noise, air quality, and ground access conditions associated with the Airport. In this section, current activity levels at the Airport are compared to prior-year levels, and historical passenger and operations trends at Logan Airport dating back to 2000, which is the year Massport approved an Environmental Management Policy.

In 2017, air passenger activity levels at Logan Airport reached 38.4 million, an increase of 5.9 percent from 2016. At the time of the 2017 ESPR filing, it was projected that Logan Airport would reach 50 million annual passengers in the next 10 to 15 years (the Future Planning Horizon). Air passenger activity levels at Logan Airport in 2018 and 2019 increased to 40.9 million in 2018 and 42.5 million in 2019. The 2019 passenger activity level represented a high for Logan Airport, which had been averaging an annual passenger growth of 5.9 percent since 2013 and continued to outpace the overall U.S. passenger growth of 4.1 percent per year for the same time period. The 2018/2019 EDR indicates that the analysis provided for Massport's forecast is consistent with the FAA's Terminal Area Forecast (TAF).

As indicated in the 2017 ESPR, Massport needs to ensure mitigation is being provided A-12 commensurate with increased growth and associated impacts. The projection of 50 million annual air passengers in the next 10 to 15 years represents an average annual growth rate of 1.5 percent. As noted above, the 2018 and 2019 growth rates exceed the 1.5 annual growth rate and data for 2020 would likely have exceed the projections, absent the decrease associated with COVID-19 pandemic. As previously stated in the 2017 ESPR, I expect that future EDRs will include additional information if actual growth in passenger and/or aircraft operations outpace the forecasts. Specifically, the EDR(s) should explain the circumstances that caused the growth, describe how this may affect the impact forecasts, and identify mitigation and policy strategies that will be implemented to address the proportional growth in impacts. A-13 In addition, as noted above, the future EDRs should include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. The EDR should also include a description of the economic, financial, or other factors that will inform this decision. A-14 I continue to reserve the right to require that future ESPRs evaluate a range of activity forecasts based on the results of this interim reporting. A-15 I also expect that air and noise emissions related to passenger and activity levels and planning/mitigation will be a significant emphasis of the 2020/2021 EDR. A-16

Domestic air passengers represent Logan Airport's largest market segment, accounting for approximately 81.2 and 80.2 percent of total air passengers in 2018 and 2019, respectively. The domestic passenger market increased by 6.9 percent in 2018 compared to 2017, and by 2.6 percent from 2018 to 2019. According to the 2018/2019 EDR, the continued economic and personal income growth of the New England region and the increased need for business travel contributed to the increase in domestic passenger demand over 2018 and 2019.

International passenger traffic at Logan Airport increased by 5.3 percent in 2018 over 2017 and 9.7 percent over 2018 levels. In 2018 and 2019, international passengers comprised approximately 18.5 and 19.6 percent of total Airport passengers, respectively. Since 2013, the international air passenger segment has averaged a 10.6-percent annual growth. According to the 2018/2019 EDR, this increase was driven by strong market demand as well as a rapid increase in foreign carrier services in recent years. As a large hub airport along the U.S. eastern seaboard, Logan Airport also ranked sixth in terms of transatlantic international passengers with nearly 5.0 million passengers flying to Europe, the Middle East, and Africa in 2019, increasing by 10.3 percent compared to 2018.

Aircraft operations continued the long-term trend of increasing at a slower rate than passenger growth. In 2018, operations totaled 424,024 and 2019 operations totaled 427,176. That growth was directly correlated to the strong national and regional economy. Even with the strong growth, aircraft operations remained well below the 487,996 operations in 2000 and the historic peak of 507,449 that aircraft operations reached in 1998. The combination of fewer operations in cleaner and quieter aircraft has resulted in dramatically reduced environmental impacts when compared with those historical peaks.

The increasing number of passengers per flight reflects a shift away from smaller aircraft and rising load factors as airlines continue to focus on capacity control and improvements in efficiency. This trend is indicative of the industry-wide shift toward higher aircraft load factors and an increase in the number of domestic and international destinations. In 2019, Logan Airport operations accommodated an average of 99.5 passengers per flight compared to 96.6 in 2018 and 95.7 in 2017, which is the highest average in the last decade. The 2018/2019 EDR attributes this increase in 2018 and 2019 to the introduction of newer and larger aircraft like the Airbus 350 and Boeing 787 at Logan Airport, especially for international long-haul flights to both existing and new destinations. The average number of passengers per flight has risen by 27.9 percent since 2010 when the average number of passengers per flight was 77.8. In 2019, Logan Airport's average domestic load factor was 85.1 percent, an increase from 2018 levels of 84.2 percent and 2017 levels of 82.6 percent. The national average domestic load factor also increased during the same period, from 81.8 percent in 2017 to 84.4 percent in 2018 and 85.1 percent in 2019.

The 2018/2019 EDR provides an update on measures that have been implemented to improve accessibility to the Airport and a relieve on-Airport roadway congestion. In 2018 and 2019, Massport's strategies to improve and expand HOV service to and from Logan Airport included continued investment in Logan Express facilities and service. These improvements were in support of Massport's goal to double Logan Express shuttle bus ridership from 2 million to 4 million passengers (by the time Logan Airport reaches 50 million passengers), to reduce passenger and employee VMT, congestion, and associated air quality emissions. Those initiatives included both the urban and suburban Logan Express sites, and focused on increasing frequencies, adding parking, improving customer amenities, and reducing fares. Massport also continued to evaluate opportunities to add an additional urban and suburban location. As a complement to the existing Logan/Back Bay service, in 2019 Massport purchased new buses in anticipation of opening a new urban location proximate to Boston's North Station in 2020. The 2018/2019 EDR indicates this effort has been deferred due to decreased demand caused by the pandemic.

The 2018/2019 EDR also describes the parking management strategy that addresses parking supply, pricing, and operations to promote the use of HOV, transit, and shared-ride options, and to reduce the environmental impacts associated with drop-off/pick-up modes. As described in prior MEPA filings, the Logan Airport Parking Project (EEA #15665) is one element of Massport's ground access strategy to reduce drop-off/pick-up modes. The parking project will provide an additional 5,000 commercial parking spaces at Logan Airport. Massport has been advancing plans for constructing 2,000 of the spaces in a new garage in front of Terminal E. The 2018/2019 EDR describes that the construction of these additional parking spaces is now deferred due to the reduction in passenger activity associated with the ongoing COVID-19 pandemic. Massport has also deferred the remaining 3,000 spaces, which are being planned as a future expansion of the Economy Garage.

The 2020/2021 EDR should report on the effectiveness of the TNC management plan and provide an update on planned and executed measures to relieve on-Airport roadway congestion A-17

including updates on the Logan Airport Parking Project. As noted above, several measures to improve the use of HOV and reduce VMT have been deferred, including the expansion of the Framingham Logan Express Garage (EEA# 16168), opening a new Logan Express suburban location, and implementing a second urban Logan Express Service at North Station. The 2020/2021 EDR should include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. To the extent feasible, the EDR should identify the metrics, monitoring data, or other criteria that will be used to inform when these measures will be implemented based on future increases in demand for air travel as the economy recovers. A-18

The 2020/2021 EDR should also report on: A-19

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Domestic and international passenger activity levels;
- Cargo and mail volumes;
- Comparison of 2020 operations and passenger activity levels to 2018/2019 activity levels; and
- National aviation trends compared to Logan Airport trends.

Sustainability at Logan Airport

The 2018/2019 EDR describes Massport's airport wide sustainability goals as identified in its International Organization for Standardization (ISO) 14001 Environmental Management System (EMS) and Sustainability Management Plan (SMP). The Logan Airport SMP (2015) is integrated with the existing EMS framework to promote environmental, social, and economic improvement. The SMP identifies efforts to promote, coordinate, and integrate sustainability initiatives Airport-wide. Progress towards achieving these goals is addressed in the 2018/2019 EDR. Some highlights of initiatives that were completed in 2018 and 2019 include: conducting a comprehensive waste assessment of Logan Airport which categorized more than 5.5 tons of material; development of Massport's Resiliency Web Tool; completion of the Logan Airport Stormwater and Flood Risk Modeling Study; updating the Logan Flood Operations Plan and Heavy Weather and Flood Operations Plan; and, relocation of Ride App pick up and drop off locations to central garage to help reduce traffic congestion. The Logan Airport Annual Sustainability Report, first published in April 2016, provides a progress summary of sustainability efforts at Logan Airport based on Massport's sustainability goals and targets established in the Logan Airport SMP. It highlights Massport's progress towards improving sustainability and enhancing resiliency at its facilities.

Massport is currently working on a vision for Massport's "Sustainability 2.0" as a next-level planning effort to implement principles and approaches from the SMP at other Massport facilities and to update Massport's sustainability goals and targets. Massport is currently advancing a series of short-term initiatives to help reach its goals in the areas of (1) energy and GHG emissions; (2) water conservation; (3) community, employee, and passenger well-being; (4) materials, waste management, and recycling; (5) resiliency; (6) noise abatement; (7) air quality improvement; (8) ground access and connectivity; (9) water quality/stormwater; and (10) natural resources. In early 2019, Massport conducted a series of charrettes with Massport staff, tenants, and business partners to help define this vision. Massport is currently working on a detailed set of recommendations for Sustainability 2.0. Updates will be reported in future Massport Annual Sustainability and Resiliency Reports and included in future EDRs.

The 2018/2019 EDR describes how a number of sustainability and resiliency projects at the airport have been deferred due to the COVID-19 pandemic such as installing a solar PV system at the

new garage in front of Terminal E in 2020. In addition, Massport has installed electric vehicle (EV) charging facilities in all its garages and plans to install them in the proposed new garage in front of Terminal E and the expanded Economy Garage when these projects are constructed. However, both projects are currently deferred. The 2020/2021 EDR should provide updates to airport wide A-20
sustainability goals. As noted above, the 2020/2021 EDR should include a description of the decision making process and factors that will be used to inform the timing of implementation of the deferred capital projects to ensure that mitigation is being provided commensurate with activity levels and associated impacts as the economy recovers and demand for air travel increases. To the extent feasible, the EDR should identify the metrics, monitoring data, or other criteria that will be used to inform when these measures will be implemented based on future increases in demand for air travel as the economy recovers.

<u>Climate Change</u>

Massport assets and Logan Airport, in particular, are critical infrastructure and play an important role in the economy. As recognized in Executive Order (EO) 569 "Establishing an Integrated Climate Change Strategy for the Commonwealth" and a suite of other state and municipal initiatives, the impacts of climate change must be an important consideration for development across the state. Climate change presents a serious threat to the environment and the Commonwealth's residents, communities, and economy. The EO indicates that extreme weather events associated with climate change present a serious threat to public safety and the lives and property of our residences.

The EO also identifies the transportation sector as a significant contributor to GHG emissions in the Commonwealth and the only sector in which GHG emissions are increasing. In 2017, EEA and the Massachusetts Department of Transportation (MassDOT) conducted a number of transportation listening sessions throughout the Commonwealth to inform development of strategies and programs to reverse the growth in this sector. The 2018/2019 EDR addresses Massport's consistency with EO 569, the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, and the Massachusetts Energy Plan.

GHG emissions

The 2018/2019 EDR incorporates GHG emissions reporting consistent with that provided in the 2017 ESPR which was normalized to support effective review and analysis. The 2018/2019 EDR includes only conditioned (heated and cooled, enclosed buildings) building areas in energy use and emission intensity calculations, reports input energy components (oil, gas, electricity) and central plant data, and clarifies how renewable energy technologies are accounted for in the analysis. The 2018/2019 EDR contains a GHG emissions inventory for Logan Airport which presented emissions and energy data normalized by passenger use and building area. The GHG emissions associated with buildings and vehicles were presented as pounds of carbon dioxide (CO_2) per passenger.

The GHG emissions for aircraft, ground support equipment (GSE), motor vehicles, and stationary sources were quantified using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (Airport Cooperative Research Program (ACRP) Report 11, Project 02-06). The 2018/2019 EDR compares the results of the 2018 and 2019 GHG emissions inventory to the 2017 ESPR results. The analysis showed total Logan Airport GHG emissions increased from 2017 to 2018 by approximately 10 percent and from 2018 to 2019 by approximately 4 percent. These increases are primarily due to the increase in aircraft operations (i.e., 5.6 percent in 2018 and 0.7 percent in 2019). According to the 2018/2019 EDR, the GHG emissions associated with Logan Airport in 2018 and 2019 are approximately 1 percent of the most recent statewide emissions estimates.

The 2020/2021 EDR should incorporate GHG emissions reporting consistent with that provided in the 2018/2019 EDR which was normalized to support effective review and analysis. In addition, A-21
Massport should ensure that only conditioned (heated and cooled, enclosed buildings) building areas are included in energy use and emission intensity calculations, report input energy components (oil, gas, electricity) and central plant data, and clarify how renewable energy is accounted for in the analysis. I encourage Massport to consider the recommendations identified in comments from the Department of Energy Resources (DOER) which recommend electrification of space and water heating as well as A-22
evaluation of opportunities for distributed renewable energy generation. Massport should consult with the MEPA Office and the DOER regarding presentation of GHG data in the 2020/2021 EDR.

In the 2020/2021 EDR, GHG emissions should continue to be quantified for aircraft, GSE, motor vehicles, and stationary sources using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook* A-23
on Preparing Airport Greenhouse Gas Emissions Inventories as developed for the 2018/2019 EDR. The results of the 2020 GHG emissions inventory should be compared to the 2018 and 2019 results.

Adaptation and Resiliency

The 2018/2019 EDR describes the resiliency program developed by Massport to identify critical infrastructure and to enhance its resiliency. As reported in the Logan Airport 2018 Annual Sustainability and Resiliency Report approximately 60 percent of critical assets (electrical power, diesel fuel pumping stations, telecommunications systems, and public safety) have been protected from storm surge flooding via relocation, and/or raising in elevation. This exceeds the 2020 resiliency target of elevating at least 25 percent of critical assets. A particular concern for Massport is the effect of sea level rise and projected increases in the severity and frequency of storms. To address this concern, Massport has initiated a Disaster and Infrastructure Resiliency Planning (DIRP) Study for Logan Airport which includes a hazard analysis, modeling of sea-level rise and storm surge, and projections of temperature, precipitation, and anticipated increases in extreme weather events. The DIRP Study provides recommendations regarding short-term strategies to make Massport's facilities more resilient to the effects of climate change. The 2018/2019 EDR provides a summary of the DIRP Study and identifies projects that were completed in 2018 and 2019 (specifically, the flood resiliency projects described below), and identifies which recommendations Massport will implement in the short term and long term. The 2020/2021 EDR should continue to identify which recommendations will be implemented by A-24
Massport to improve resiliency.

As part of the DIRP Study Massport created a Floodproofing Design Guide was published in November 2014 and updated in November 2018. Operational aspects of resiliency strategy include the development of Flood Operations Plans for Logan Airport. This plan were introduced in 2014 and included the planned deployment of temporary flood barriers to protect up to 12 locations of critical infrastructure in the event of severe weather. Additional locations have been permanently enhanced to prevent flooding. The flood operations plans were re-evaluated in 2018 to enhance their effectiveness and to adapt to evolving requirements and past experiences. The 2020/2021 EDR should identify which recommendations will be implemented by Massport to improve resiliency.

The effects of climate change, such as extreme heat, may exacerbate the negative health effects of air pollution. As the effects of climate change progress, I encourage Massport to consider its ability to reduce negative air quality effects as a matter of public health, and to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. As discussed below, the 2020/2021 EDR should report on findings regarding health and airport impacts in relation to emissions, as well as measures to reduce these impacts. A-25

Mitigation

The 2018/2019 EDR provides an update on Massport's mitigation commitments under the MEPA for projects at Logan Airport for which an EIR was filed to document that all feasible measures have been taken to avoid or minimize impacts. The 2018/2019 EDR addresses cumulative, Airport-wide impacts. It also updates the status of mitigation commitments for recent projects such as the Terminal E Modernization Project and the Logan Airport Parking Project as well as projects previously included in the EDRs.

The 2020/2021 EDR should continue to report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review. It should update the status of Massport's mitigation commitments and also identify projects for which mitigation is complete. A-26

Planning

The Airport Planning section describes the status of projects underway or completed at Logan Airport since the filing of the 2017 ESPR which provided updates of work through 2019. Specific topics include terminal area projects, service area projects, buffer/open space projects, Airport parking projects, airside area projects, HOV improvements, and Airport-wide projects.

During 2018 and 2019 there was a strong focus on ground access and trip reduction measures, and terminal improvements. Recent and ongoing terminal area projects are providing seamless post-security connectivity and flexibility among the terminals along with enhancements to passenger processing through consolidated security checking areas. To enhance the on-Airport roadway network, Massport is improving several of the terminal area roadway segments and intersections. In October 2019, Massport opened its new TNC consolidated drop-off and pick-up areas in the Central Garage. In 2018 and 2019, Massport also advanced several HOV services and Logan Express facilities improvements as part of its trip-reduction goals. The 2018/2019 EDR outlines several planning projects that were deferred due to the COVID-19 pandemic.

Project updates include:

- The Logan Airport Parking Project, which will add 5,000 commercial parking spaces at Logan Airport in locations already in use for parking. The additional parking spaces respond to the MassDOT and U.S. Environmental Protection Agency (EPA)'s approval of a modification to the regulatory Logan Airport Parking Freeze. The additional spaces are intended to reduce dropoff/pick-up modes. The joint MEPA and federal review process was completed in January 2020. As noted earlier, this project is currently deferred due to the reduction in passenger activity associated with the COVID-19 pandemic.

- Terminal C Canopy, Connector and Roadway Project received federal environmental approval under NEPA in November 2018. As described in the 2017 ESPR, construction of this project will replace and reconfigure sections of the elevated roadways connecting Terminals B and C. At this time, construction of the replacement canopy is anticipated to begin and be completed in 2021, with a slightly reduced program than originally planned. The Terminal B to C Connector is anticipated to be complete in spring 2022 and roadways are anticipated to be complete in 2023.

The 2020/2021 EDR should continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport must accommodate and guide tenant development. The EDR should describe the status of planning initiatives for the following areas:

- Roadways and Airport Parking; A-27
- Terminal Area;
- Airside Area;
- Service and Cargo Areas;
- Airport Buffers and Landscaping; and,
- Energy, Sustainability, and Resiliency.

The 2020/2021 EDR should also indicate the status of long-range planning activities, including A-28 the status of public works projects implemented by other agencies within the boundaries of Logan Airport. The 2020/2021 EDR should provide an update on Logan Airport Parking project, including a description of the decision making process and factors that will be used to inform the timing of its implementation. To the extent feasible, the EDR should identify the metrics, monitoring data, or other A-29 criteria that will be used to inform when it will be implemented based on future increases in demand for air travel as the economy recovers. The 2020/2021 EDR should identify the status and assess the effectiveness of ground access changes, including roadway and parking projects, that consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on streets in A-30 adjacent neighborhoods.

Regional Transportation

The 2018/2019 EDR describes activity levels at New England's regional airports and provides an update on regional planning activities, including long-range transportation efforts. The New England region is anchored by Logan Airport and a system of 10 other commercial service, reliever, and general aviation (GA) airports (regional airports). In 2018 and 2019, the New England region saw an increase in air passenger activity. Regional air passengers increased by 6.5 percent to 58.3 million air passengers in 2018 and by 2.5 percent in 2019 (59.7 million). The 10 regional airports in New England accommodated 17.3 and 17.2 million air passengers in 2018 and 2019, respectively, compared to 16.3 million passengers in 2017.

The 2020/2021 EDR should report on:

Regional Airports

- 2020 regional airport operations, passenger activity levels, and schedule data within an historical context;
- Status of plans and new improvements as provided by the regional airport authorities;
- Regional economic factors;
- Role of the Worcester Regional Airport and Hanscom Field in the regional aviation system and Massport's efforts to promote these airports; and
- Ground access improvements.

A-31

Regional Transportation System

- Massport's role in managing the regional aviation facilities;
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership.

A-32

Ground Access to and from Logan Airport

The 2018/2019 EDR reports that average daily traffic and VMT on Airport roadways has increased in 2018 and 2019 compared to 2017. It provides data on transit ridership, roadways, traffic volumes, and parking. Specifically, the 2017 ESPR states that Massport has continued to invest in and operate Logan Airport with a goal of increasing the number of passengers arriving by transit or other HOV modes. The 2018/2019 EDR provides a discussion of ground access modes and trip generation associated with each mode including: (1) transit and shared-ride HOV services; (2) drive to Logan Airport and park; or (3) drop-off/pick-up mode, which can involve a private vehicle, taxi, limousine, or TNCs.

Average weekday on-Airport VMT increased by about 4.5 percent from 2017 to 2018. Between 2018 and 2019, average weekday on-Airport VMT increased by 2.2 percent. The change in average daily traffic can be attributed primarily to the increases in air passenger activity, passenger drop-off/pick-up, cargo, and non-aviation related Airport uses. Additionally, the use of mobile application ride-booking (RideApp) services, such as Uber and Lyft, are increasingly becoming a mode of choice for ground access at Logan Airport. RideApp transactions totaled more than 7 million in 2018 and increased to over 8 million in 2019, a growth of over 16 percent. RideApps are impacting other access modes to the Airport and contributing to on-Airport congestion. Partially due to the continued rise of RideApps, black car limousines and scheduled van ridership dropped by nearly 23 percent from 2017 to 2019. Taxi dispatches declined 14 percent in 2018 compared to 2017 and 7 percent between 2018 and 2019. The Massachusetts Bay Transportation Authority (MBTA) Blue Line ridership increased by 4 percent between 2017 and 2018 and declined by 29 percent the following year.

Based on changes in passenger mode choice for accessing Logan Airport observed between 2017 and 2019, Massport updated its goals and definition of HOV. The updated definition considers vehicle occupancies of taxis, black car limousines, and RideApps that carry two or more air passengers per vehicle to be HOV, while the same modes with one air passenger will count as non-HOV. With this updated definition, the 2018/2019 EDR describes that Massport established a goal of 35.5 percent HOV by 2022 and 40 percent by 2027. Based on the results of the 2019 Air Passenger Ground-Access Survey, HOV mode share has reached 40.4 percent, exceeding both near-term and longer-term goals. While it is anticipated that the HOV mode share will drop as a result of COVID-19 over the short term, Massport expects HOV ridership to recover over time and remains committed to the HOV mode share goals moving forward.

The 2020/2021 EDR should report on 2020 ground access conditions at the airport and provide a comparison to 2018 and 2019 for the following:

- Description of compliance with Logan Airport Parking Freeze;
- HOV ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express);
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport VMT;
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning and the connection to the MBTA Airport Station associated with the planned Terminal E Modernization;
- Project, anticipated MBTA ridership, and possible changes in HOV mode share; and
- Trends of TNCs and their operations at Logan Airport.

A-33

The 2020/2021 EDR should address the following topics:

- Target HOV mode share and incentives;
- Impact of TNCs on Logan Airport landside operations and effectiveness of the TNC management plan;
- Update on parking conditions;
- Non-Airport through-traffic;
- Cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Silver Line, Water Transportation, and Logan Express;
- Report on efforts to increase capacity and use of Logan Express;
- Progress on enhancing water transportation to and from Logan Airport;
- Results and recommendations of the ground access study Long-term Parking Management Plan required by the Parking Freeze amendments; and
- Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.

A-34

Noise

The 2018/2019 EDR provides an update on the status of the noise environment at Logan Airport in 2018 and 2019 and describes Massport's efforts to mitigate noise exposure and impacts. As described below in greater detail, the implementation of the RNAV Pilot study being jointly undertaken by FAA and Massport has resulted in concentration of flight patterns over certain communities and significant increases in noise exposure. The effects of this program are identified as significant concerns in the majority of comment letters. The 2018/2019 EDR provides updates of how Massport and FAA are continuing to work with the Massachusetts Institute of Technology (MIT) to investigate opportunities to reduce noise through changes to PBN, including RNAV. This cooperation is a first-in-the-nation project between FAA and an airport operator to better understand the implications of PBN and evaluate strategies to address community concerns.

The 2018/2019 EDR provides noise modeling results from the AEDT. The model requires detailed operational data as inputs for noise calculations, including numbers of operations per day by aircraft type and by time of day, which runway is used for each arrival and for each departure, and flight track geometry for each track. The 2018/2019 EDR also presents summaries of the 2018 and 2019 operational data used in the noise modeling, as well as the resultant annual Day-Night Average Sound Level (DNL) noise contours, a comparison of the modeled results with measured levels from the noise monitoring system, and estimates of the population residing within various increments of noise exposure in 2018 and 2019.

Both FAA and the U.S. Department of Housing and Urban Development consider DNL exposure levels above 65 decibels (dB) to be incompatible with residential land use. The 2018/2019 EDR describes how there was an overall decrease in the total number of people residing within the DNL 65 dB contour from 2017 to 2018. However, the number within the DNL 65 dB contour increased in Winthrop and Revere while decreasing in East Boston. From 2017 to 2018, there was an increase in total operations and in nighttime operations, but the primary factor in the DNL contour changes was a shift in 2018 back to typical runway use following the extended Runway 4L-22R closure in 2017.

Massport monitors flights that operate during the DNL nighttime period of 10:00 PM to 7:00 AM, when each modeled flight is increased by 10 dB in calculations of noise exposure. Nighttime operations during this period represented 16.1 percent and 16.6 percent of total operations in 2018 and 2019, respectively. Nighttime operations increased, from an average of 168 per night in 2017 to 187 per night in 2018 and 195 per night in 2019. This represents a total nighttime operations increase of 11.3 percent from 2017 to 2018, and another 4.4 percent from 2018 to 2019. The main increases to nighttime commercial activity were in passenger aircraft operations, primarily resulting from the overall growth in domestic air carrier flights and increased flights to international destinations. The majority (about 81 percent) of nighttime operations occurred either before midnight or after 5:00 AM.

The 2019 DNL contours are similar in shape and size to those for 2018, with small changes due to runway use shifts, increases in nighttime operations, and overall operations growth in 2019. The total number of people residing within the DNL 65 dB contour increased from 7,034 in 2018 to 8,768 in 2019. The additional population within the DNL 65 dB contour is mainly located in East Boston, primarily due to an increase in Runway 33L departures due to an increase in northwest winds in 2019. The estimated population (based on 2010 U.S. Census data) within the DNL 65 dB contour decreased by about 11 percent from 2017 to 2018 (going from 7,933 to 7,034) and increased again about 25 percent from 2018 to 2019 (to 8,768). The populated area included in the 2018 DNL 65 dB contour decreased in East Boston but increased in Winthrop and Revere, as compared to 2017. The populated area within the 2019 DNL 65 dB contour increased in East Boston and Winthrop and decreased in Revere, as compared to 2018.

Due to the effects of the COVID-19 pandemic and resulting decreased aircraft operations, the EDR also included assumptions about noise in 2020 through fall 2020. Massport predicts that the reduction in operations and changes in the fleet mix will likely result in a 40 percent or larger reduction in the DNL noise contour for 2020. Due to the pandemic, several airlines have retired larger and older aircraft models. When air traffic does return, it is anticipated that the mix of aircraft types will be different than the aircraft mix documented in the 2018/2019 EDR which will be updated in the 2020/2021 EDR.

In 2018, Massport received 71,381 noise complaints from 82 communities, an increase from 59,343 noise complaints from 95 communities in 2017. In 2019, the number of complaint calls rose to 268,929 from 86 communities. The number of individual complainants decreased from 4,269 callers in 2017 to 2,178 callers in 2018, and then increased again to 2,671 callers in 2019. The increase in complaints continues to be primarily related to the FAA's RNAV departure procedures, which concentrate flight tracks along narrower corridors. Complaints rose significantly in the communities overflown by Runway 33L departures (East Boston, Medford, Arlington, Somerville, Watertown, and Winchester). The 2018/2019 EDR attributes this due to a combination of several factors: an increase in departures from Runway 33L in 2019, increased ability to submit a complaint, and increased public awareness through various community groups. Complaints from communities under the Runway 27 flight path also increased due to similar reasons, including higher use of Runway 27 for departures and increased community awareness. All complaints have been forwarded to FAA. The 2018/2019 EDR also provides an update on the Memorandum of Understanding (MOU) between Massport and FAA to frame the process for analyzing opportunities to reduce noise through changes or amendments to PBN including RNAV. The 2018/2019 EDR also states that FAA and Massport are committing to: measure and model the benefits and impacts of changing some RNAV approaches; and, test and develop an implementation plan, which will include environmental analysis and community/public outreach.

The 2018/2019 EDR identifies which noise abatement measures are being employed and reports on the status of the sound insulation program since 1990. The 2018/2019 EDR describes that Massport continues to seek funding for noise mitigation for properties that are eligible for participation in its Residential Sound Insulation Program (RSIP). In 2019, Massport updated its RSIP Noise Exposure Map contours and submitted an AEDT-derived noise exposure map to the FAA in 2020 for review and discussion. To date, Massport has provided sound insulation for a total of 36 schools and 11,515 residential units. Eligibility for sound insulation must follow FAA guidelines which requires that the residence is located within the latest DNL 65 dB contour and interior noise levels within habitable rooms of noncompatible structures must be 45 dB or greater with the windows closed.. in the 2018/2019 EDR indicated that in March 2020, the FAA issued revised guidance which, for the first time, allows residences before 1993 to be eligible for consideration for improved sound insulation. Eligibility of this category of residences is still contingent on a current, FAA approved 65DNL contour and pre-testing requirements. In March 2021, the FAA issued additional clarifications regarding this change emphasizing that current policy regarding qualification for sound insulation also applies to the categories of residences treated before 1993. As suggested in several comments, Massport updated its Noise Exposure Map contours and submitted an AEDT-derived noise exposure map to FAA in 2020 for review and discussion. The FAA requires that a submitted sound insulation program contour should represent current operational conditions; generally, the contour year should match the date of the document submittal. However, due to the significant decrease in 2020 operations caused by the COVID-

19 pandemic, Massport developed a 2019 forecast contour, including block rounding representing pre-COVID conditions , and submitted it to FAA in the summer of 2020. Once accepted by the FAA, Massport will reach out to eligible homeowners to discuss potential mitigation options for their homes, subject to federal and Massport funding availability.

The 2020/2021 EDR must provide strategies to address noise impacts which are expressed in A-35
numerous comments received on the 2018/2019 EDR. Massport should continue to implement and
develop additional noise abatement measures, such as runway use restrictions and reduced-engine A-36
taxiing. Massport should also coordinate with stakeholders through the Massport Community Advisory A-37
Committee to identify opportunities to reduce noise.

The 2020/2021 EDR should also provide an overview of the environmental regulatory A-38
framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2020 conditions and provide a comparison to 2018 and 2019 for the following:

- Fleet Mix, including Stage II, Recertified Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft; A-39
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals); and,
- Flight tracks.

The 2020/2021 EDR should report on the following:

- Changes in annual noise contours and noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed; A-40
- Cumulative Noise Index (CNI);
- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and
- Flight track monitoring noise reports.

The 2020/2021 EDR should also report on noise abatement efforts, results from Boston Logan
Airport Noise Study (BLANS) study, and provide an update on the noise and operations monitoring
system. It should also report on the status of Block 1 and 2 of the RNAV Pilot Project, which will A-41
analyze the feasibility of changes to some of RNAV approaches and departures from Logan Airport.

<u>Air Quality/Emissions Reduction</u>

The 2018/2019 EDR provides an overview of airport-related air quality issues in 2018 and 2019 and the efforts to reduce emissions. The air quality modeling is based on aircraft operations, fleet mix characteristics, and airfield taxiing times combined with GSE usage, motor vehicle traffic volumes, and stationary source utilization rates. The 2018/2019 EDR uses FAA's approved computer model for calculating emissions from aircraft-related sources AEDT model (v. AEDT 2d). Total air quality emissions from all sources associated with Logan Airport are significantly lower than a decade ago. The 2018/2019 EDR identifies Massport's initiatives to improve air quality and reduce emissions, including: replacement of gas- and diesel-powered GSE with all-electric GSE (eGSE) by the end of 2027 (as commercially available); implementation of additional initiatives to increase HOV use, continue to reduce emissions from Massport fleet vehicles, and encourage use of alternative fuel vehicles; and implementation of energy efficiency projects, including upgrades to the Central Heating and Cooling Plant, and increasing the use of renewable energy, such as solar and wind installations.

Massport prepared emissions inventories for 2018 and 2019 for the criteria pollutants carbon monoxide (CO), particulate matter (PM10/PM2.5), volatile organic compounds (VOCs), and oxides of nitrogen (NOx). Key findings of those emissions inventories include: total modeled emissions of CO, PM10/PM2.5 and NOx, increased from 2017 to 2018 by approximately 14 percent, 17 percent, and 4 percent, respectively. VOCs remained consistent. These increases were mainly attributable to the 5.6-percent increase in aircraft operations in 2018 compared to 2017. Variations in emissions were also due to airframe/engine combination parameters included in the two model versions used and the associated differences in applied emission factors assumed in the models. In 2019, total modeled emissions of CO, PM10/PM2.5, and VOCs each increased by about 2 percent from 2018. NOx emissions instead increased by about 5 percent. The 2018/2019 concludes these changes are also due to an increase in aircraft operations of 0.7 percent as well as slight variations in the aircraft fleet mix from 2018 to 2019. Additionally, increases in NOx emissions in 2019 are associated with higher stationary source fuel usages in that year. Modeled emissions of CO, VOC, and NOx associated with GSE and motor vehicles, many of which Massport has influence over, have declined from 2018 to 2019. Emissions of PM10/PM2.5 remain steady. While there are model version differences between 2017 and 2018, causing variances in emissions between those years, overall GSE and motor vehicles show a decreasing trend from 2017 to 2019 for all pollutants. As previously mentioned, GHG emissions also increased from 2017 to 2018 by approximately 10 percent and from 2018 to 2019 by approximately 4 percent, primarily due to the increase in aircraft operations (i.e., 5.6 percent in 2018 and 0.7 percent in 2019). Aircraft emissions continue to represent the largest source (95 percent) of NOx at Logan Airport, followed by other sources (2 percent), ground service equipment (GSE) (2 percent), and motor vehicles (1 percent).

The 2020/2021 EDR should continue to provide an overview of the environmental regulatory A-42
framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality
modeling. The 2020/2021 EDR should also provide discussion of progress on national and international A-43
levels to decrease air emissions. Massport should continue to use the latest version of FAA's AEDT
model for air emissions modeling as was presented in the 2018/2019 EDR. The EPA Motor Vehicle
Emission Simulator (MOVES) tool should continue to be used to assess vehicular emissions on airport A-44
roadways. The 2020/2021 EDR should include a mobile sources emissions inventory for CO, NOx,
VOCs, and PMs. It should also report on Massport and tenant alternative fuel vehicle programs and the A-45
status of Logan Airport air quality studies undertaken by Massport or others, as available. The
2020/2021 EDR should demonstrate that Massport's programs to maintain and increase HOV modes A-46
provide the capacity to meet demand associated with growth.

Commenters continue to express concern regarding ultrafine particulates (UFPs). The 2018/2019
EDR includes information on the status of UFP review by EPA and an update on associated and
monitoring. For the first time, the 2018/2019 EDR includes information about research into the health
impacts of aviation. I appreciate Massport including this information and expect that the 2020/2021
EDR will include an update on it. The 2020/2021 EDR should also provide an update on the status and A-47
the findings of UFP research being performed by Tufts University and Boston University regarding the
identification of airport-specific related UFPs in an urban environment. The 2020/2021 EDR should
present more direct information about the major research findings around health and airport impacts in A-48

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Secretary of the Executive Office of Energy and Environmental Affairs Certificate on the *Logan Airport 2017 Environmental Status and Planning Report (ESPR)*

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The Commonwealth of Massachusetts

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November 25, 2019

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
2017 LOGAN AIRPORT ENVIRONMENTAL STATUS AND PLANNING REPORT

PROJECT NAME	: 2017 Environmental Status and Planning Report (ESPR)
PROJECT MUNICIPALITY	: Boston/Winthrop
PROJECT WATERSHED	: Boston Harbor
EOEA NUMBER	: 3247
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: August 7, 2019

As Secretary of the Executive Office of Energy and Environmental Affairs (EEA), I hereby determine that the Status and Planning Report submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA) (M.G.L. c. 30, ss. 61-62I) and with its implementing regulations (301 CMR 11.00).

The environmental review process for Logan Airport has been structured to occur on two levels: airport-wide and project-specific. The Environmental Status and Planning Report (ESPR) has evolved from a largely retrospective status report on airport operations to a broader analysis that also provides a prospective assessment of long-range plans. It has thus become, consistent with the objectives of the MEPA regulations, part of the Massachusetts Port Authority's (Massport) long-range planning process. The ESPR provides a "big picture" analysis of the environmental impacts associated with current and projected activity levels, and presents a comprehensive strategy to minimize impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project-specific Environmental Impact Reports (EIRs). The ESPR is generally updated on a five-year basis. The

previous ESPR for the year 2011 was filed in April of 2013. Environmental Data Reports (EDRs) are filed in the years between ESPRs. The EDR is a retrospective document that is filed annually and identifies environmental impacts based on actual passenger activity and operations. The 2017 ESPR is the subject of this review. This 2017 ESPR follows the 2016 EDR and reports on 2017 and future conditions. In addition, Massport has requested to combine both the 2018 EDR and the 2019 EDR into one document referred to as the 2018/2019 EDR. I have considered and granted this request. This Certificate also contains a Scope for the 2018/2019 EDR. A-1

I have received comments from elected officials and municipalities including State Representative Adrian Madaro, State Senator Walter Timilty, State Representative RoseLee Vincent, Boston City Councilor Lydia Edwards, the Town of Winthrop's Board of Health, and the Selectboard of the Town of Milton. Comments were also submitted by municipalities, environmental advocacy groups, community organizations, and residents. The 2017 ESPR acknowledges that passenger activity has continued to grow faster than forecasts provided in the 2016 EDR and the previous 2011 ESPR. The majority of comment letters note that actual passenger growth has outpaced previous projections and identify concerns that measures to mitigate resulting noise, air quality, and transportation impacts have not been provided commensurate with the increased growth. Comments also identify concerns that the projected passenger growth rate underrepresents future conditions and associated impacts. A-2 Comments from State Representative Adrian Madaro, State Representative RoseLee Vincent, the Conservation Law Foundation (CLF), Airport Impact Relief Incorporated (AIR Inc.), the Town of Milton, and others request that Massport develop and analyze a higher passenger and aircraft growth scenario based upon actual growth rates. Comments also request that Massport present more direct information about the major research findings around health and airport impacts, including likely pollution and noise health impacts, and commitments from Massport for the reduction of and mitigation of these impacts. A-3

In addition to responding to these comments, the 2018/2019 EDR should report on the progress and other refinements for tracking noise, traffic, and air emissions and abatement efforts, as further described in the Scope below. A-4 The 2018/2019 EDR will document potential impacts and trends and propose measures to avoid, minimize and mitigate environmental impacts. Should actual growth in passenger and/or aircraft operations outpace the forecasts, I expect that additional information will be provided in future EDRs. Specifically, the EDR(s) should explain the circumstances that caused the growth, describe how this may affect the impact forecasts, and identify mitigation and policy strategies that will be implemented to address the proportional growth in impacts. Furthermore, I reserve the right to require that future ESPRs evaluate the impacts of a range of activity forecasts, based on the results of the interim reporting provided in the EDRs. A-5

Logan Airport Environmental Review and Planning

The ESPR is generally responsive to the Scope. It contains useful data on activity levels and impacts, and lays out a forecast for trends in the future years. The technical studies in the 2017 ESPR include reporting on, and analysis of, key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking. This 2017 ESPR focuses on: (1) rapidly growing domestic and international passenger demand; (2) the formal introduction of transportation network companies (TNC), such as Uber and Lyft, to Logan Airport and subsequent effects; (3) airport-wide emissions including those associated with vehicle trips; (4) use of the Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) for noise and air quality modeling; and, (5) noise abatement strategies.

In 2017, passenger activity at Logan Airport continued to grow faster than previous forecasts. Air passenger activity levels at Logan Airport reached an all-time high of 38.4 million in 2017, an increase of 5.9 percent over what was projected in the 2016 EDR. Aircraft operations increased to a total of 401,371 in 2017, an increase of 2.6 percent over 2016. This trend continued in 2018 with air passenger activity levels of 40.9 million and aircraft operations totaling 424,024. The growth is directly correlated to the strong national and regional economies and an increase in demand for international air service. Massport has responded to this demand for international air by providing new service to international destinations and expanding service to existing destinations. As passenger levels have increased, aircraft operations remain significantly below the peak of 507,449 operations experienced in 1998 when Logan Airport served 26.5 million passengers. The reduction of over 100,000 annual flight operations, combined with the transition towards newer and larger aircraft with improved environmental performance and operational efficiencies, have supported passenger growth while limiting environmental impacts.

Although environmental impacts are significantly lower compared to 1998 when operations were highest, comparison of activity level and environmental impact data to the 2016 EDR identifies incremental increases in noise exposure, air emissions and traffic. These increases were not forecast in the previous 2011 ESPR. The current passenger forecast is higher by approximately 10 million passengers, or 26 percent higher, than the previous 2011 ESPR planning forecast of 39.8 million passengers. The 2017 ESPR forecast for aircraft operations (486,364) is approximately 2.5 percent higher than the 2011 ESPR operations forecast (474,734). These increases are associated with passenger growth, changes in flight patterns, and changes in modeling of noise and air quality. The 2017 ESPR indicates that terminals, roadways, and parking facilities are strained by these increases and identifies on-Airport improvements to relieve on-Airport roadway congestion and accessibility.

Logan Airport passenger ground access is changing rapidly with the use of TNCs for departures and arrivals at the Airport. Massport began collecting TNC data in 2017 when TNCs were authorized to pick up customers from the airport. The 2017 ESPR provides data and identifies effects of TNCs and provides an assessment of ground access trends.

The most significant change since the previous 2011 ESPR is the introduction by the FAA of changes to area navigation (RNAV) procedures. The RNAV program has been implemented throughout the country and its primary purpose is to increase safety and operational efficiency. The implementation of several of these procedures has resulted in concentrations of flight patterns over certain communities and significant increases in noise exposure. The impact of the RNAV program is emphasized in comment letters received on the 2017 ESPR and during review of specific projects, including the Terminal E Modernization Project (EEA# 15434).

Massport and the FAA signed a Memorandum of Understanding (MOU) in 2017 to frame a new process for analyzing opportunities to incrementally reduce noise through changes or amendments to Performance Based Navigation (PBN), including RNAV procedures. The 2017 ESPR provided an update on this process and described Massport's efforts to mitigate noise exposure and impacts.

The 2017 ESPR provides information on noise conditions modeled using the latest FAA noise modeling software, the Aviation Environmental Design Tool (AEDT). Massport transitioned to AEDT from the Integrated Noise Model (INM) in its 2016 EDR. The 2017 ESPR also uses FAA's AEDT model for emission factors compared to the legacy Emissions and Dispersion Modeling System (EDMS) model. Massport attributes some of the changes in air emissions to the use of the AEDT model, which assumes higher nitrogen oxides emission factors compared to the legacy EDMS model.

Review of the 2017 ESPR and Scope for the 2018/2019 EDR

The 2017 ESPR identifies the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts; analyzes trends and environmental impacts of operations in calendar year 2017 and provides projections for the next 10 to 15 years; and provides updates on projects, environmental management plans, and the status of project mitigation.

The 2018/2019 EDR must include information on the environmental policies and planning that form the context of environmental reporting, technical studies, and environmental mitigation initiatives against which projects at Logan Airport can be evaluated. This should include identification of the cumulative effects of Logan Airport operations and activities. The results of the Logan Airport Air Passenger Ground Access Survey and the Long-term Parking Management Plan should inform transportation planning and strategies to achieve the high occupancy vehicle (HOV) mode share goal. A-6

The 2018/2019 EDR must include copies of all ESPR and EDR Certificates and a distribution list (indicating those receiving documents, CDs, or Notices of Availability). Supporting technical appendices should be provided as necessary. A-7

Response to Comments

The Response to Comments section should address all of the substantive comments on the 2017 ESPR, and other Certificates for Logan Airport that reference EDR/ESPR documentation (e.g. Logan Airport Parking Project, Terminal E). To ensure that the issues raised by commenters are addressed, the 2018/2019 EDR should include direct responses to comments to the extent that they are within MEPA jurisdiction. This directive is not intended to, and shall not be construed to, enlarge the scope of the EDR beyond what has been expressly identified in this Certificate. The Responses to Comments should not reference a section of the EDR unless they are directly responsive to the comment. Common themes that should be addressed A-8 throughout the EDR and in the Responses to Comments include noise (modeling of noise contours and noise abatement) and emissions reduction issues. The EDR should include sufficient information to address comments on traffic, air quality, and public health, which are common concerns of commenters. A-8

Activity Levels

Air traffic activity levels at Logan Airport are the basis for the evaluation of noise, air quality, and ground access conditions associated with the Airport. In this section, current activity levels at the Airport are compared to prior-year levels, and historical passenger and operations trends at Logan Airport dating back to 2000 which is the year Massport approved an Environmental Management Policy. The total number of aircraft operations at Logan Airport increased for a total of 401,371 in 2017, an increase of 2.6 percent over 2016. Aircraft operations remain well below the 487,996 operations in 2000 and the historic peak of 507,449 operations reached in 1998. The slower growth in aircraft operations compared to passenger levels is due to the steady increase in aircraft size and improving aircraft load factors (passengers/available seats). Air carrier efficiency continued to improve in 2017 as the average number of passengers per aircraft operation at Logan Airport grew from 92.8 in 2016 to 95.7 in 2017. The increasing number of passengers per flight reflects a shift away from smaller aircraft and rising load factors as airlines continue to focus on capacity control and improvements in efficiency. This trend is indicative of the industry-wide shift toward higher aircraft load factors and an increase in the number of domestic and international destinations.

Logan Airport is considered an origin and destination airport both nationally and internationally, meaning that approximately 90 percent of Logan Airport passengers either start or end their trip in the New England area. According to the 2017 ESPR, international passenger levels increased at a faster rate than domestic passenger levels in 2017. Domestic air passenger activity levels increased by 5.1 percent while international air passenger activity levels increased by 9.3 percent over 2016 levels. The 2017 ESPR indicates that strong international passenger growth was driven by the economic attractiveness of the metropolitan Boston region and the strength of Boston as an origin and destination market. In response to regional demand for international service, new non-stop services were introduced by a number of airlines including Air Berlin, Norwegian Air Shuttle, Qatar Airways, Scandinavian Airlines, and TAP Air Portugal. New international destinations from Logan Airport in 2016 included Dusseldorf, London Gatwick, Doha, Copenhagen, and Lisbon.

The 2017 ESPR also updates the Logan Airport long-term passenger forecast to reflect growth trends at Logan Airport and revised expectations for the local/national/international economy. It addresses methodologies and assumptions used in the analysis, including anticipated changes to fleet mix and other trends in the aviation industry.

Passenger activity has continued to grow faster than forecasts provided in the 2016 EDR and the previous 2011 ESPR. In 2017, air passenger activity levels at Logan Airport reached 38.4 million, an increase of 5.9 percent over 2016. The 2017 passenger level represents a record high for Logan Airport. The ESPR projects that Logan Airport will reach 50 million annual passengers in the next 10 to 15 years (the Future Planning Horizon). This 2017 ESPR evaluates

future operational and environmental conditions associated with this increase in passenger activity. This level of air passengers is forecast to be accommodated in approximately 486,000 annual aircraft operations. The 2017 ESPR indicates that the analysis provided for Massport's forecast is consistent with the FAA's Terminal Area Forecast (TAF) that states within the 10- to 15-year planning horizon, the FAA forecasts 50 million annual air passengers at Logan Airport.

The 2017 ESPR provides a description on how Massport will achieve long-standing goals to reduce overall operating and environmental impacts at the airport as passengers and, in particular, international passengers increase. With this growth comes challenges, and Massport has to develop strategies to address these challenges in a manner that will allow Logan Airport to evolve in a sustainable and environmentally-responsible way. If this passenger level is reached sooner, Massport needs to ensure mitigation is being provided commensurate with increased growth and associated impacts. Passenger activity reached an all-time high in 2017 and the ESPR indicated this growth continued into 2018, with 40.9 million air passengers. According to the ESPR, this peak follows unprecedented, consistent growth since 2013 at a 6.2 percent annual average growth, making Logan Airport one of the fastest growing airports in the US in terms of passenger activity levels. The projection of 50 million annual air passengers in the next 10 to 15 years represents an average annual growth rate of 1.5 percent. While I understand that growth at Logan Airport can be attributed to the strong local, regional, and national economies, many comments identify concerns that Massport may reach 50 million annual passengers much sooner than the projected 10 to 15 year timeframe. I expect that additional information will be provided in future EDRs if actual growth in passenger and/or aircraft operations outpace the forecasts, including a discussion of passenger and activity levels and planning/mitigation to address impacts of the growth. I reserve the right to require that future ESPRs evaluate a range of activity forecasts based on the results of this interim reporting. I also expect that air and noise emissions related to passenger and activity levels and planning/mitigation will be a significant emphasis of the 2018/2019 EDR. A-9

To improve accessibility to the Airport as well as to relieve on-Airport roadway congestion, Massport proposes to enhance HOV and Logan Express facilities, implement on-Airport roadway and Massachusetts Bay Transportation Authority (MBTA) Blue Line/intra-terminal connectivity projects, construct a consolidated transportation network company (TNC, such as Uber and Lyft) drop-off and pick-up area, and construct new parking facilities, which will help reduce the number of drop-off/pick-up trips. The 2018/2019 EDR should report on the effectiveness of the TNC management plan and provide an update on planned and executed measures to relieve on-Airport roadway congestion. A-10

The 2018/2019 EDR should also report on:

- Aircraft operations, including fleet mix and scheduled airline services at Logan Airport;
- Domestic and international passenger activity levels;
- Cargo and mail volumes;
- Comparison of 2018/2019 operations and passenger activity levels to 2017 activity levels; and
- National aviation trends compared to Logan Airport trends.

Sustainability at Logan Airport

The 2017 ESPR describes Massport's airport wide sustainability goals as identified in its International Organization for Standardization (ISO) 14001 Environmental Management System (EMS) and Sustainability Management Plan (SMP). In 2015, Massport completed the Logan Airport SMP through a grant awarded by the FAA. The SMP is integrated with the existing EMS framework to promote environmental, social, and economic improvement. The SMP identifies efforts to promote, coordinate, and integrate sustainability initiatives Airport-wide. Progress towards achieving these goals is addressed in the 2017 ESPR. The 2017 ESPR also describes the Annual Sustainability and Resiliency Report, released in April 2018. The report highlights achievements and progress toward Massport's sustainability goals and targets since the release of the SMP in 2015 and the publication of the Annual Sustainability Report in 2016. Massport has achieved three sustainability targets for energy use per square foot, energy use per passenger, and greenhouse gas (GHG) emissions per passenger. The 2018/2019 EDR should provide updates to airport wide sustainability goals. A-11

Climate Change

Massport assets and Logan Airport, in particular, are critical infrastructure and play an important role in the economy. As recognized in Governor Baker's recent Executive Order (EO) 569 "Establishing an Integrated Climate Change Strategy for the Commonwealth" and a suite of other state and municipal initiatives, the impacts of climate change must be an important consideration for development across the state. Climate change presents a serious threat to the environment and the Commonwealth's residents, communities, and economy. The EO indicates that extreme weather events associated with climate change present a serious threat to public safety and the lives and property of our residences.

The EO also identifies the transportation sector as a significant contributor to GHG emissions in the Commonwealth and the only sector in which GHG emissions are increasing. In 2017, EEA and the Massachusetts Department of Transportation (MassDOT) conducted a number of transportation listening sessions throughout the Commonwealth to inform development of strategies and programs to reverse the growth in this sector. The 2017 ESPR addresses Massport's consistency with EO 569, the Massachusetts State Hazard Mitigation and Climate Adaptation Plan, and the Massachusetts Energy Plan.

GHG emissions

The 2017 ESPR incorporates GHG emissions reporting consistent with that provided in the 2016 EDR which was normalized to support effective review and analysis. The 2017 ESPR includes only conditioned (heated and cooled, enclosed buildings) building areas in energy use and emission intensity calculations, reports input energy components (oil, gas, electricity) and central plant data, and clarifies how renewables are accounted for in the analysis. The 2017 ESPR contains a GHG emissions inventory for the Logan Airport which presented emissions and energy data normalized by passenger use and building area. The GHG emissions associated with buildings and transportation were presented as pounds of carbon dioxide (CO_2) per passenger.

Energy use for buildings were presented as Kilo British Thermal Units (kBtu) per square foot (sf) per year. The analysis showed that Massport has reduced emissions per passenger across its operations by 39 percent from 2007 to 2017. Building energy use has been reduced 23 percent while building emissions have been reduced 44 percent from 2007 to 2017.

The 2017 ESPR quantifies GHG emissions for aircraft, ground support equipment (GSE), motor vehicles, and stationary sources using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* (Airport Cooperative Research Program (ACRP) Report 11, Project 02-06). The 2017 ESPR compares the results of the 2017 GHG emissions inventory to the 2016 EDR results. Total GHG emissions increased from 2016 to 2017 by about 8 percent due primarily to the increase in aircraft operations. Total emissions of GHG in the Future Planning Horizon are predicted to be about 23 percent higher than 2017 levels predominantly due to the predicted increase in aircraft operations. Specifically, this is attributable to the forecasted approximate 21 percent increase in aircraft operations and 31 percent increase in passenger traffic, each resulting in an increase in fuel usage and vehicle miles traveled (VMT). The Future Planning Horizon Massport-related emissions are expected to represent about 10 percent of total GHG emissions at the Airport. Tenant-based emissions are anticipated to represent about 71 percent; electrical consumption from Massport, common areas, and tenants are anticipated to represent about 7 percent; and passenger vehicle emissions are anticipated to represent about 12 percent of total GHG emissions.

The 2018/2019 EDR should incorporate GHG emissions reporting consistent with that provided in the 2017 ESPR which was normalized to support effective review and analysis. In addition, Massport should ensure that only conditioned (heated and cooled, enclosed buildings) building areas are included in energy use and emission intensity calculations, report input energy components (oil, gas, electricity) and central plant data, and clarify how renewables are accounted in the analysis. I encourage Massport to consider the recommendations identified in comments from the Department of Energy Resources (DOER) which recommend electrification of space and water heating as well as evaluation of opportunities for distributed renewable energy generation. Massport should consult with the MEPA Office and the DOER regarding presentation of GHG data in the 2018/2019 EDR. A-12

The 2018/2019 EDR GHG emissions should continue to be quantified for aircraft, GSE, motor vehicles, and stationary sources using emission factors and methodologies outlined in the *Greenhouse Gas Emissions Policy and Protocol* issued by EEA and the Transportation Research Board's *Guidebook on Preparing Airport Greenhouse Gas Emissions Inventories* as developed for the 2017 ESPR. The results of the 2018/2019 GHG emissions inventory should be compared to the 2017 results. A-13

Adaptation and Resiliency

The 2017 ESPR details the resiliency program developed by Massport to identify critical infrastructure and to enhance its resiliency. As reported in the Logan Airport 2018 Annual Sustainability and Resiliency Report included in the 2017 ESPR, approximately 60 percent of critical assets (electrical power, diesel fuel pumping stations, telecommunications systems, and public safety) have been protected from storm surge flooding via relocation, and/or raising in elevation, exceeding the 2020 resiliency target of 25 percent. A particular concern for Massport is the effect of sea level rise and projected increases in the severity and frequency of storms. At the end of 2013, in recognition of the potential effects of climate change on Massport infrastructure and operations, Massport initiated a Disaster and Infrastructure Resiliency Planning (DIRP) Study for Logan Airport. The DIRP Study includes a hazard analysis, modeling sea-level rise and storm surge, and projections of temperature, precipitation, and anticipated increases in extreme weather events. The DIRP Study provides recommendations regarding short-term strategies to make Massport's facilities more resilient to the effects of climate change. In addition to the DIRP Study and its related initiatives, Massport has completed an Authority-wide risk assessment; issued a Floodproofing Design Guide (which was updated in April 2016); and developed a resilience framework to provide consistent metrics for short- and long-term planning and protection of its critical facilities and infrastructure. The 2017 ESPR provides a summary of the DIRP Study and identifies which recommendations Massport will implement in the short term and long term. The 2018/2019 EDR should continue to identify which recommendations will be implemented by Massport to improve resiliency. A-14

The effects of climate change, such as extreme heat, may exacerbate the negative health effects of air pollution. As the effects of climate change progress, I encourage Massport to consider its ability to reduce negative air quality effects as a matter of public health, and to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. As discussed below in greater detail, the 2018/2019 EDR should report on findings around health and airport impacts in relation to emissions, as well as measures to reduce these impacts. A-15

Mitigation

The 2017 ESPR provides an update on Massport's mitigation commitments under the MEPA for projects at Logan Airport for which an Environmental Impact Report (EIR) was filed and state Section 61 Findings were committed in order to document that all feasible measures have been taken to avoid or minimize impacts. The 2017 ESPR addresses cumulative, Airport-wide impacts. The 2017 ESPR also updates the status of mitigation commitments for recent projects such as the Terminal E Modernization Project and the Logan Airport Parking Project as well as projects previously included in the EDRs.

The 2018/2019 EDR should continue to report on the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review. It should update the status of Massport's mitigation commitments and also identify projects for which mitigation is complete. A-16

Planning

The Airport Planning section describes the status of projects underway or completed at Logan Airport by the end of 2017. Specific topics include terminal area projects, service area projects, buffer/open space projects, Airport parking projects, airside area projects, HOV improvements, and Airport-wide projects. Project updates include:

- *Terminal E Renovation and Enhancements Project*: This project includes interior and exterior improvements at Terminal E to accommodate regular service by wider and longer Group VI aircraft. The project reconfigured three gates to accommodate Group VI aircraft (including the Airbus A380 and Boeing 747-8 primarily used by international air carriers) and passenger holdrooms to accommodate larger passenger loads associated with these aircraft. Construction was completed in early 2017.

- *Terminal E Modernization Project*: This project will accommodate existing and long range forecasted demand for international service. The expansion will add the three gates approved in 1996 (International Gateway West Concourse project, EEA #9791), which were never constructed, and four additional new gates in an extended concourse. A key feature of this project is the first direct pedestrian connection from the MBTA Blue Line Airport Station to the terminal complex at Logan Airport. It will also include roadway improvements to facilitate access to the terminal.

- *Terminal C to E Airside Connector:* This project provides a new post-security connection between Terminals C and E on the Departures Level and provides improved passenger circulation within the post-security concourses, additional holdroom space at Terminal E, reconfigured office space, concessions and concessions support, and a new consolidated location for escalators and stairs. The project was completed in May 2016.

- *Terminal B Airline Optimization Project:* Massport is upgrading its facilities on the Pier B side of Terminal B to meet airlines' needs (primarily reflecting the merger of American Airlines and US Airways) and to provide facilities that improve the passenger traveling experience. Similar improvements have been implemented with the recent renovations and improvements at Terminal B, Pier A. Planned improvements include an enlarged ticketing hall; improved outbound bag area; and expanded bag claim hall, concession areas, and holdroom capacity at the gate. Final design is complete and construction is underway. Construction was completed in 2019.

- Massport is also planning improvements to Terminal A, including interior upgrades in the main terminal and satellite terminal, enhanced passenger amenities, reconfiguration and improvements at the security checkpoint, and a feasibility study of post-security connection between Terminal A and Terminal B, and Terminal A and Terminal E.

- *Logan Airport Parking Project*: This project includes the construction of up to 5,000 new commercial parking spaces to reduce trip generation associated with increases in passenger drop-off and pick-up at the airport. The Certificate on the Draft Environmental Impact Report (DEIR) was issued on August 2, 2019 and included a Scope for the Final Environmental Impact Report (FEIR). The project required an amendment to the Logan Airport Parking Freeze Regulations (310 CMR 7.30). Amendments to the regulations were promulgated in 2017. During the review of the 2017 ESPR Massport released three studies to identify ways to further support alternative transit options to and from the Airport, which the amended Parking Freeze regulations required Massport to complete. The results of these studies will inform Massport's future long-range planning efforts to reduce air passenger-related VMT and associated air emissions which will extend the associated air quality benefits of this project.

- In addition to the planned roadway improvements as part of the Terminal C Building, Roadway and Curb Enhancements, Terminal E Modernization, and Logan Airport Parking Projects, Massport is considering other possible infrastructure modifications. Several options are being considered to reduce on-Airport congestion and improve on-Airport ground access efficiency, including dedicated HOV bus lanes, the creation of an intermodal transportation center with bus service to terminals, and the construction of an Automated People Mover (APM).

- *Maintenance of Airport Edge Buffer Areas and Parks:* The 2017 ESPR provides updates on the planning, construction, and maintenance of four Airport edge buffer areas and two parks along Logan Airport's perimeter. As of 2017, the Bayswater Buffer, Navy Fuel Pier Buffer, SWSA Buffer Phase 1 and the SWSA Buffer Phase 2 have been completed. These buffers and parks include 3.3 miles and more than 33 acres of green space developed or managed by Massport.

The 2018/2019 EDR should continue to assess planning strategies for improving Logan Airport's operations and services in a safe, secure, more efficient, and environmentally sensitive manner. As owner and operator of Logan Airport, Massport must accommodate and guide tenant development. The EDR should describe the status of planning initiatives for the following areas: A-17

- Roadways and Airport Parking;
- Terminal Area;
- Airside Area;
- Service and Cargo Areas;
- Airport Buffers and Landscaping; and,
- Energy, Sustainability, and Resiliency.

The 2018/2019 EDR should also indicate the status of long-range planning activities, including the status of public works projects implemented by other agencies within the boundaries of Logan Airport. The 2018/2019 EDR should identify the status and assess the effectiveness of ground access changes, including roadway and parking projects, that consolidate and direct airport-related traffic to centralized locations and minimize airport-related traffic on streets in adjacent neighborhoods. A-18

<u>Regional Transportation</u>

The 2017 ESPR describes activity levels at New England's regional airports and provides an update on regional planning activities, including long-range transportation efforts. The New England region is anchored by Logan Airport and a system of 10 other commercial service, reliever, and general aviation (GA) airports (regional airports). In 2017, passenger traffic at the New England airports represented the highest passenger traffic level for the region since the economic downturn in 2008. In 2017, the total number of air passengers utilizing these 11 New

England commercial service airports increased by 5.5 percent, from 51.9 million air passengers in 2016 to 54.7 million passengers in 2017.

The 2018/2019 EDR should report on: A-19

Regional Airports

- 2018 and 2019 regional airport operations, passenger activity levels, and schedule data within an historical context;
- Status of plans and new improvements as provided by the regional airport authorities;
- Regional economic factors;
- Role of the Worcester Regional Airport and Hanscom Field in the regional aviation system and Massport's efforts to promote these airports; and
- Ground access improvements at Massachusetts Regional Airports.

Regional Transportation System

- Massport's role in managing the regional aviation facilities;
- Massport's cooperation with other transportation agencies to promote efficient regional highway and transit operations; and
- Report on metropolitan and regional rail initiatives and ridership.

<u>Ground Access to and from Logan Airport</u>

The 2017 ESPR reports that average daily traffic and VMT on Airport roadways has increased in 2017 compared to 2016. The 2017 ESPR provides data on transit ridership, roadways, traffic volumes, and parking. Specifically, the ESPR states that Massport has continued to invest in and operate Logan Airport with a goal of increasing the number of passengers arriving by transit or other HOV modes. The 2017 ESPR provides a discussion of ground access modes and trip generation associated with each mode including: (1) transit and shared-ride HOV services; (2) drive to Logan Airport and park; or (3) drop-off/pick-up mode, which can involve a private vehicle, taxi, limousine, or TNCs.

Average weekday on-Airport VMT increased by about 11 percent from approximately 176,840 in 2016 to 196,500 in 2017. The change in average daily traffic can be attributed primarily to the increases in air passenger activity, passenger drop-off/pick-up, cargo, and non-aviation related Airport uses. Additionally, the use of mobile application ride-booking services, such as Uber and Lyft, are increasingly becoming a mode of choice for ground access at Logan Airport. TNCs were estimated to contribute about 15,000 vehicle trips per day. TNCs are impacting other access modes to the Airport and contributing to on-Airport congestion. Partially due to the emergence of TNCs, black car limousines and scheduled van ridership dropped by 40 percent from 2016 to 2017. Taxi dispatches declined 18 percent and MBTA Blue Line ridership decreased by 2 percent in 2017 compared to 2016. The 2017 ESPR does not present a quantifiable comparison between VMT values prior to 2011 because the previous model was limited to terminal access roads while the current VMT model includes a larger on-Airport study area. Massport has proposed to construct a consolidated TNC drop-off and pick-up area and implement a TNC management plan to encourage shared rides and reduce gateway congestion.

Massport remains in compliance with the Parking Freeze regulations which regulates the number of commercial and employee parking spaces allowed at Logan Airport. As required, Massport submits semi-annual filings to the Massachusetts Department of Environmental Protection (MassDEP) to demonstrate compliance with the Logan Airport Parking Freeze. The full reports for 2017 are included in the 2017 ESPR. As permitted (and encouraged) by the regulations, Massport has converted employee spaces to commercial spaces, within the overall limits. In 2017, the Logan Airport Parking Freeze was amended to allow for an increase of up to 5,000 on-Airport commercial parking spaces, which allows for the construction of additional parking to reduce drop-off/pick up modes and alleviate constrained on-Airport parking conditions. MassDEP issued the amended regulation on June 30, 2017, approving the requested Parking Freeze increase. On December 5, 2017, the U.S. Environmental Protection Agency (EPA) proposed a rule approving the revision of the Massachusetts SIP incorporating the amended Logan Airport Parking Freeze. The final rule was issued on March 6, 2018 and became effective on April 5, 2018.

The 2017 ESPR describes a multi-pronged trip reduction strategy to reduce the number of private vehicles that access Logan Airport and, in particular, the drop-off/pick-up modes. Measures implemented in 2017 by Massport to increase HOV use include a blend of initiatives related to pricing (incentives and disincentives), service availability, service quality, marketing, and traveler information. The 2017 ESPR introduced a new definition for HOV modes. In the 2016 EDR and previous documents, Massport identified all taxis and TNCs as non-HOV and all black car limousines as HOV. The 2017 ESPR will estimate HOV and non-HOV breakdowns for taxis, livery services, and TNCs based on whether there is more than one passenger. Consistent with the directive identified in the Certificate for the Logan Airport Parking Project, and through negotiations with the CLF, Massport has committed to a goal of 35.5 percent HOV by 2022 and 40 percent by 2027.

The Airport-wide Automated Traffic Monitoring System (ATMS) includes permanent traffic count stations at the Airport's gateway roadways. These stations provide data on annual average daily traffic (AADT), annual average weekday daily traffic (AWDT), and annual average weekend daily traffic (AWEDT). The AADT (entering and departing Logan Airport) increased by 4.1 percent between 2016 and 2017. The change in average daily traffic can be attributed to: an 5.9-percent increase in air passenger activity in 2017; the impact of TNCs, which generated approximately 15,000 vehicle trips per day; and an increase in drop-off/pick-up activity by private and commercial automobiles.

The 2017 ESPR describes improvements to support HOV access which include: Back Bay Logan Express service (since May 2014); free boarding of the MBTA Silver Line outbound (from Logan Airport); a 1,100-car parking garage at the Framingham Logan Express; reduced holiday travel parking rates at Logan Express facilities; increased parking rates on the Airport; and support for private coach bus and van operators. Logan Express passenger ridership from suburban park-and-ride locations increased by over 6 percent from 2016 to 2017 and overall service increased by about 1 percent. The 2017 identified a continued decrease in ridership to and from Back Bay Logan Express, which has been a noted trend since the MBTA's Government Center Station reopened.

In the next 10 to 15 years Logan Airport is anticipated to reach 50 million air passengers. While the 2017 ESPR above discusses strains placed on the Airport's roadway infrastructure at 2017 levels (38.4 million passengers) the 2018/2019 EDR is an opportunity to commit to further reducing congestion and associated emissions by increasing HOV ridership, reducing TNC deadheading activity (empty one-way trips), increasing on-Airport parking to reduce drop-off/pick-up, and expanding Logan Express service and facilities. The 2018/2019 EDR should provide an expanded mitigation package to address the transportation impacts associated with increased passenger activity should actual passenger growth outpace the forecasts. A-20

The 2018/2019 EDR should report on 2018 and 2019 ground access conditions at the airport and provide a comparison to 2017 for the following:

- Description of compliance with Logan Airport Parking Freeze;
- High-occupancy vehicle (HOV) ridership (including Blue Line, Silver Line, Water Transportation, and Logan Express);
- Logan Airport Employee Transportation Management Association (Logan TMA) services;
- Logan Airport gateway volumes;
- On-airport traffic volumes;
- On-airport vehicle miles traveled (VMT); A-21
- Parking demand and management (including rates and duration statistics);
- Status of long-range ground access management strategy planning and the connection to the Massachusetts Bay Transportation Authority (MBTA) Airport Station associated with the planned Terminal E Modernization;
- Project, anticipated MBTA ridership, and possible changes in HOV mode share; and
- Trends of transportation network companies (TNCs), such as Uber and Lyft, and their operations at Logan Airport.

The 2018/2019 EDR should address the following topics:

- Target HOV mode share and incentives;
- Impact of TNCs on Logan Airport landside operations and effectiveness of the TNC management plan;
- Update on parking conditions;
- Non-Airport through-traffic;
- Cooperation with other transportation agencies to increase transit ridership to and from Logan Airport via the Blue Line, Silver Line, Water Transportation, and Logan Express; A-22
- Report on efforts to increase capacity and use of Logan Express;
- Progress on enhancing water transportation to and from Logan Airport;
- Results and recommendations of the ground access study Long-term Parking Management Plan required by the Parking Freeze amendments; and
- Strategies for enhancing services and increasing employee membership in the Logan Airport TMA.

Noise

The 2017 ESPR updated the status of the noise environment at Logan Airport in 2017, provided a projection of noise impacts for the Future Planning Horizon, and described Massport's efforts to mitigate noise exposure and impacts. As described below in greater detail, the implementation of the RNAV Pilot study being jointly undertaken by FAA and Massport has resulted in concentration of flight patterns over certain communities and significant increases in noise exposure. The effects of this program are identified as significant concerns in the majority of comment letters.

The 2017 ESPR provides noise modeling results from the AEDT. The model requires detailed operational data as inputs for noise calculations, including numbers of operations per day by aircraft type and by time of day, which runway is used for each arrival and for each departure, and flight track geometry for each track. The 2017 ESPR also presents summaries of the 2017 operational data used in the noise modeling, as well as the resultant annual Day-Night Average Sound Level (DNL) noise contours, a comparison of the modeled results with measured levels from the noise monitoring system, and estimates of the population residing within various increments of noise exposure in 2017.

Both FAA and the U.S. Department of Housing and Urban Development consider DNL exposure levels above 65 decibels (dB) to be incompatible with residential land use. Population exposed to DNL levels greater than or equal to DNL 65 dB noise levels increased by 483 people, from 7,450 in 2016 to 7,933 in 2017. Runway use changes from 2016 to 2017 were the largest factor influencing noise exposure in 2017. The one-month closure of Runway 4R-22L from May and June 2017 and its continued limited availability for arrivals into September 2017 are reflected in the noise contour changes presented in the 2017 ESPR. An additional factor influencing noise contour changes in 2017 was an increase in nighttime operations, from 55,499 in 2016 to 61,155 operations in 2017, an increase of 10.2 percent. The DNL 65 dB contour is projected to increase due to expected growth in operations in the next 10 to 15 year Future Planning Horizon projects. Therefore, the total number of people residing in the DNL 65 dB contour would also increase. The 2017 ESPR also provides the Future Planning Horizon DNL contours presented compared to 2017. The contours indicate that the total number of nighttime operations for the Future Horizon Planning forecast (an average nightly 167.75) will remain almost the same as in 2017, while the daytime operations are expected to grow from an average of 932 operations to 1,165 daily (25 percent increase). The 2017 ESPR states that the contours represent a conservative estimate of the future noise levels because Massport assumes the continued advancement in aircraft technology will result in quieter engines and actual lower noise levels in the future.

In 2017, noise complaints more than doubled. Massport received 59,343 noise complaints from 95 communities, a 56-percent increase from the 2016 total of 38,045 noise complaints from 83 communities. The increase in complaints continues to be primarily related to the FAA's RNAV departure procedures, which concentrate flight tracks along narrower corridors. All complaints have been forwarded to FAA. The 2017 ESPR also provides an update on the Memorandum of Understanding (MOU) between Massport and FAA to frame the process for analyzing opportunities to reduce noise through changes or amendments to Performance

Based Navigation (PBN), including RNAV. The 2017 ESPR also states that FAA and Massport are committing to: measure and model the benefits and impacts of changing some RNAV approaches; and, test and develop an implementation plan, which will include environmental analysis and community/public outreach.

The 2017 ESPR EDR identifies which noise abatement measures are being employed and reports on the status of the sound insulation program since 1990. To date, Massport has installed sound insulation in 5,467 residences, including 11,515 dwelling units, and 36 schools in East Boston, Roxbury, Dorchester, Winthrop, Revere, Chelsea, and South Boston. Eligibility for sound insulation must follow FAA guidelines which requires that the residence is located within the latest DNL 65 dB contour and interior noise levels within habitable rooms of noncompatible structures must be 45 dB or greater with the windows closed. The FAA will allow a residence to be treated under the sound insulation program one time; homes treated previously are not eligible for additional consideration.

A-23

The 2018/2019 EDR must provide strategies to address noise impacts which are expressed in numerous comments received on the 2017 ESPR. Massport should continue to implement and develop additional noise abatement measures, such as runway use restrictions and reduced-engine taxiing. Massport should also coordinate with stakeholders through the Massport Community Advisory Committee to identify opportunities to reduce noise.

A-24

The 2018/2019 EDR should also provide an overview of the environmental regulatory framework affecting aircraft noise, the changes in aircraft noise, and the updates in noise modeling. The chapter should report on 2018 and 2019 conditions and provide a comparison to 2017 for the following:

- Fleet Mix, including Stage II, Recertified Stage III, newly manufactured Stage III, and qualifying Stage IV aircraft;
- Nighttime operations;
- Runway utilization (report on aircraft and airline adherence with runway utilization goals);
- Preferential runway advisory system (PRAS) tracking; and
- Flight tracks.

A-25

The 2018/2019 EDR should report on the following:

- Changes in annual noise contours and noise-impacted population;
- Measured versus modeled noise values, including reasons for differences and any improvements attributable to the models deployed;
- Cumulative Noise Index (CNI);
- Times-Above for 65, 75, and 85 dBA threshold values/Dwell and Persistence of noise levels; and
- Flight track monitoring noise reports.

A-26

The 2018/2019 EDR should also report on noise abatement efforts, results from Boston Logan Airport Noise Study (BLANS) study, and provide an update on the noise and operations monitoring system. It should also report on the status of Block 1 and 2 of the RNAV Pilot Project, which will analyze the feasibility of changes to some of RNAV approaches and departures from Logan Airport. A-26

Air Quality/Emissions Reduction

The 2017 ESPR provided an overview of airport-related air quality issues in 2017, efforts to reduce emissions, and projections for Future Planning Horizon emissions. The air quality modeling is based on aircraft operations, fleet mix characteristics, and airfield taxiing times combined with GSE usage, motor vehicle traffic volumes, and stationary source utilization rates. The 2017 ESPR uses FAA's approved computer model for calculating emissions from aircraft-related sources AEDT model. The latest version of AEDT is 2d (AEDT 2d), which was released in February 2018. Total air quality emissions from all sources associated with Logan Airport are significantly lower than a decade ago. The 2017 ESPR identifies Massport's initiatives to improve air quality and reduce emissions, including: replacement of gas- and diesel-powered GSE with all-electric GSE (eGSE) by the end of 2027 (as commercially available); implementation of additional initiatives to increase HOV use, continue to reduce emissions from Massport fleet vehicles, and encourage use of alternative fuel vehicles; and implementation of energy efficiency projects, including upgrades to the Central Heating and Cooling Plant, and increasing the use of renewable energy, such as solar and wind installations.

Aircraft emissions continue to represent the largest source (94 percent) of nitrogen oxides (NOx) at Logan Airport. In 2017, total emissions of NOx increased by about 12 percent from 2016 to 2017. Modeled NOx emissions increased to 5,935 kg/day compared to 5,300 kg/day in 2016. The increase in NOx from 2016 to 2017 is almost entirely attributed to the forecasted increase in aircraft operations at the Airport coupled with the changing aircraft fleet (i.e., greater use of quieter, more fuel-efficient aircraft engines that overall result in fewer emissions with the exception of NOx) . Emissions of NOx are predicted to increase by about 37 percent in the Future Planning Horizon compared to 2017. The changes are also attributable to the FAA's AEDT model, which assumes higher NOx emission factors compared to the legacy Emissions and Dispersion Modeling System (EDMS) model. NOx emissions associated with GSE, motor vehicles, and stationary sources, many of which Massport has control or influence, have declined from 2016 to 2017. As stated previously in this Certificate, GHG emissions also increased from 2016 to 2017 by about 8 percent due primarily to the increase in aircraft operations. Total emissions of GHG in the Future Planning Horizon are predicted to be about 23 percent higher than 2017 levels predominantly due to the predicted increase in aircraft operations.

Total modeled emissions of carbon monoxide (CO), particulate matter (PM10/PM2.5), and volatile organic compounds (VOCs) have decreased from 2016 to 2017 by about 4 percent, 20 percent, and less than 1 percent, respectively, even though aircraft operations have increased over the same time period. Specifically, total modeled emissions of VOCs decreased in 2017 to 1,273 kilograms (kg)/day, compared to 1,280 kg/day in 2016. Total modeled CO emissions decreased in 2017 to 7,092 compared to 7,350 kg/day in 2016. Total PM10/PM2.5 emissions have decreased to 77 kg/day in 2017 compared to 96 kg/day in 2016. The 2017 ESPR projects that total emissions of CO, PM10/PM2.5, and VOCs will decrease in the Future Planning Horizon by about 2 percent, 10 percent, and 8 percent, respectively, compared to 2017 levels.

The projected reduction in emissions is attributed to a combination of the conversion of GSE to viable electric alternatives, lower motor vehicle emissions due to greater efficiency, cleaner aircraft engine technologies, and changes in aircraft fleet mix.

The 2018/2019 EDR should contain an overview of the environmental regulatory framework affecting aircraft emissions, changes in aircraft emissions, and the changes in air quality modeling. The 2018/2019 EDR should also provide discussion of progress on national and international levels to decrease air emissions. Massport should continue to use the FAA's AEDT model for air emissions modeling as was presented in the 2017 ESPR. The 2018/2019 EDR should provide enhanced mitigation related to air emissions to address the potential of 50 million air passengers and increased activity levels if this level of growth is attained prior to the Future Planning Horizon timeframe. A-27 A-28

The EPA Motor Vehicle Emission Simulator (MOVES) tool should continue to be used to assess vehicular emissions on airport roadways. The 2018/2019 EDR should include a mobile sources emissions inventory for CO, NOx, VOCs, and PMs. It should also report on Massport and tenant alternative fuel vehicle programs and the status of Logan Airport air quality studies undertaken by Massport or others, as available. The 2018/2019 EDR should demonstrate that Massport's programs to maintain and increase HOV modes provide the capacity to meet demand associated with growth. The 2018/2019 EDR should also provide an update on its efforts to encourage the use of single engine taxiing under safe conditions. A-29

Commenters continue to express concern regarding ultrafine particulates (UFPs). The 2017 ESPR includes information on the status of UFP review by the Environmental Protection Agency (EPA) and an update on associated and monitoring. The 2018/2019 EDR should include an update on this information. It should also provide an update on the status and the findings of UFP research being performed by Tufts University and Boston University regarding the identification of airport-specific related UFPs in an urban environment. The 2018/2019 EDR should present more direct information about the major research findings around health and airport impacts in relation to emissions, including likely pollution and noise health impacts, and commitments from Massport for the reduction and mitigation of these impacts. A-30

Since October 2014, as a result of the Department of Public Health's (DPH) Logan Airport Health Study, Massport has provided funding for the East Boston Neighborhood Health Center to enhance services and educational resources for children and adults in East Boston and Winthrop who are managing asthma and/or Chronic Obstructive Pulmonary Disease (COPD). Massport should continue to fund this program and should consult with the Health Center to evaluate opportunities to expand current services, outreach, and prevention materials. The expanded program should include collaboration with East Boston and Winthrop public school nurse coordinators to identify additional high risk individuals in schools and ways to expand outreach efforts. I also recommend that Massport work with the Health Center to provide appropriate HEPA room air purifier filters to high risk individuals identified through this program. I encourage Massport to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. The 2018/2019 EDR should describe how Massport will reengage with the Health Center and include an evaluation of how the services A-31 provided directly to and through Health Center (which are funded by Massport) can be expanded. A-31

Water Quality/Environmental Compliance

The 2017 ESPR describes Massport's ongoing environmental management activities including National Pollutant Discharge Elimination System (NPDES) compliance, stormwater, fuel spills, activities under the Massachusetts Contingency Plan (MCP), and tank management. Massport's primary water quality goal is to prevent or minimize pollutant discharges, thus limiting adverse water quality impacts of airport activities. Massport employs several programs to promote awareness of activities that may impact surface and groundwater quality. Programs include implementing best management practices (BMPs) for pollution prevention by Massport, its tenants, and its construction contractors; training of staff and tenants; and a comprehensive stormwater pollution prevention plan.

The 2018/2019 EDR should identify any planned stormwater management improvements and report on the status of: A-32

- NPDES Permit and monitoring results for Logan outfalls and the Fire Training Facility;
- Jet fuel usage and spills;
- MCP activities;
- Tank management;
- Update on the environmental management plan; and
- Fuel spill prevention.

Conclusion

Massport may prepare a 2018/2019 EDR for submission consistent with the Scope included in this Certificate. I encourage Massport to target mid 2020 for filing of the 2018/2019 EDR. As noted above, should actual growth in passenger and/or aircraft operations outpace the forecasts, I expect that additional information will be provided in future EDRs to demonstrate that additional mitigation and policies and strategies will be implemented to address the proportional growth in impacts.

K. Theoharides

November 25, 2019
Date

Kathleen A. Theoharides

Comments received:

9/9/2019	Maryann Aberg
9/30/2019	Noel Scott

10/04/2019	Michael Adamian
10/09/2019	Vanessa Fazio
10/09/2019	Danielle Emond
10/09/2019	Karla Torres-Welch
10/09/2019	Lindsay Falewicz
10/10/2019	Kannan Thiruvengadam
10/10/2019	Fabricio Paes
10/10/2019	Phoebe Chadwick-Rivinus
10/10/2019	Mary Palermo
10/10/2019	Gaby Perry
10/10/2019	Nat Taylor
10/10/2019	Gillian Anderson
11/08/2019	Aileen Healy
11/13/2019	Meredith Shannon
11/13/2019	Kathleen Rourke
11/13/2019	Teresa Doyle
11/13/2019	Rosalind Mott
11/13/2019	Wendy Corkhum
11/18/2019	Town of Milton
11/18/2019	Town of Winthrop
11/20/2019	Anastacia Marx de Salcedo
11/20/2019	Richard Madden
11/20/2019	Carla Ceruzzi
11/20/2019	Cindy Christiansen
11/20/2019	Mary Tittmann
11/20/2019	Nancy Timmerman
11/20/2019	Department of Energy Resources
11/20/2019	Dorothy Ahle
11/20/2019	Frank Ciano
11/20/2019	Ursula Kullmann
11/20/2019	Romero Kuhn
11/20/2019	Matthew A Romero Massport CAC
11/20/2019	Lydia Edwards, Boston City Councilor
11/20/2019	Conservation Law Foundation
11/20/2019	Myron Kassaraba
11/20/2019	Carol Goss
11/20/2019	Alan Wright
11/20/2019	Meredith Shannon
11/20/2019	Darcey Deveny
11/20/2019	Thomas Phipps
11/20/2019	Edward Beuchert
11/20/2019	Claire Silvers
11/20/2019	Sheila Mooney
11/20/2019	Lisa Avery
11/20/2019	Danielle Simbajon
11/20/2019	Kathleen Rourke
11/20/2019	David Matheu
11/20/2019	Kathleen Higgins
11/20/2019	Gary Gryan
11/20/2019	Anita Gryan
11/20/2019	DeeNee Skipper
11/20/2019	Barbara Franklin
11/20/2019	Bill Trabilicy
11/20/2019	Martha Karchere
11/20/2019	Julia Burrell
11/20/2019	Peter Houk
11/20/2019	JP Petriello
11/20/2019	Andrea van Wien
11/20/2019	Andrea van Wien, 2nd Comment
11/20/2019	Ryan Miller
11/20/2019	Representative Roselee Vincent
11/21/2019	Representative Adrian Madara
11/21/2019	Airport Impact Relief, Inc.
11/22/2019	City of Malden
11/22/2019	Catherine McNeil
11/22/2019	Senator Walter Timilty
11/22/2019	Maureen Wing
11/22/2019	Airlines for America

Form Letters sent via email subject line: "Opposition to ESPR 2017"

10/ 12/2019	Audrina Warren
10/ 12/2019	Sara Goldsmith
10/ 17/2019	Jim Linthwaite
10/17/2019	Susan M. Horn
10/ 17/2019	Jodi Remington
10/ 17/2019	Monique Labbe
10/17/2019	Paul K. Ciampa
10/ 17/2019	Colleen Murphy
10/ 17/2019	Nancy Hurley-Claflin
10/ 17/2019	Tom Claflin
10/ 17/2019	fwb823@yahoo.com
10/ 17/2019	Robin Maguire
10/ 17/2019	Steven Tamasy
10/ 17/2019	Rebecca Lynds
10/17/2019	John Casamassima
10/17/2019	Kathryn Skogstrom
10/17/2019	Lisa DeAngelico
10/17/2019	Rebecca Gorlin
10/17/2019	Julie Rizzo
10/17 2019	Andrew Desantis
10/17/2019	Nikolas Navakos
10/17/2019	Ida Migliore
10/17/2019	Christopher Tkach
10/17/2019	Lucas Rossier
10/17/2019	Jane Paronich
10/17/2019	Charles Cambria
10/17/2019	Ali Reed
10/17/2019	Nick Camacho
10/17/2019	Jenn Cunio
10/17/2019	Michelle Mccann
10/17/2019	Angela Cilibrasi
10/17/2019	Christy Tatarian
10/17/2019	Anthony Leonardi
10/17/2019	Damien Margardo

10/17/2019	Mary Ryan
10/17/2019	Gail Miller
10/17/2019	Kristen D'Avolio
10/18/2019	Suzanne & Scott
10/18/2019	Bobbie Ross
10/18/2019	Mikki De Sisto Falcone
10/18/2019	Jim Linthwaite
10/18/2019	Rick Sherva
10/18/2019	Michael Mullen
10/18/2019	Kelly O'Keefe
10/18/2019	Mary Oconnor
10/18/2019	Kevin Donahue
10/18/2019	Karen Gaeta
10/18/2019	Sheryl Fleitman
10/18/2019	Kathleen Toland
10/18/2019	Lynn Donovan
10/18/2019	Kathleen Toland
10/18/2019	Cathy Huban
10/18/2019	Leydon, Susan
10/18/2019	Chris Millerick
10/18/2019	Brian Vogel
10/18/2019	Angela Auda
10/18/2019	Deanna Castano
10/18/2019	Rebecca Gorlin
10/18/2019	Angelique Pirozzi
10/18/2019	Gezim Mucelli
10/18/2019	Catherine Sullivan
10/18/2019	Colleen Murphy
10/18/2019	Gina Cassetta
10/18/2019	Dominic Rizzott o
10/18/2019	Kim Brazier
10/18/2019	Sara Swart
10/18/2019	Anne Griepenburg
10/18/2019	Barbara Franklin
10/19/2019	Jeanne Stewart
10/19/2019	Maura Garrity
10/19/2019	Luz-Dary Barlow
10/19/2019	Shannon Viera
10/19/2019	Roberta W Benton
10/19/2019	Mary Gail Murphy
10/19/2019	Kevin Slattery
10/19/2019	Brian Ferrari
10/19/2019	Ian Chiang
10/19/2019	Heather McKinnon Glennon
10/19/2019	Mary Palermo
10/19/2019	Tracey Honan
10/19/2019	Rebecca Connell
10/19/2019	Eivin Hila
10/20/2019	Theodore Resnikoff
10/20/2019	Jaclyn Loson
10/20/2019	Jennifer Harris
10/20/2019	Kathy Masterson
10/20/2019	Nancy Morelli
10/20/2019	Bill Masterson
10/20/2019	Zachary Heath
10/20/2019	Liddy Cole

10/20/2019	Nicole Bishop
10/21/2019	Mariellen Dalton
10/21/2019	Josephine Fatta
10/21/2019	Josephine Matthews
10/21/2019	Julia Collins
10/21/2019	Cheryl Granara
10/21/2019	Ariana Lehrer
10/21/2019	Josephine Fatta
10/21/2019	Jake Bernier
10/21/2019	Carole Brown
10/22/2019	Aleksandra Kuzina
10/22/2019	Roberta W Benton
10/22/2019	Dominique Bonafoux
10/22/2019	Robert Fiore
10/22/2019	Marie Piacenza
10/22/2019	Dawn Sullivan
10/22/2019	Frederico Leal
10/22/2019	Joan Dimarzo
10/22/2019	Vincent Crossman
10/22/2019	Wendy Corkhum
10/22/2019	Tracey Honan
10/22/2019	Lisa Foley
10/22/2019	johnbegood73@outlook.com
10/22/2019	Teresa Carroll
10/22/2019	Cindy L. Christiansen
10/22/2019	Elizabeth Tanefis
10/22/2019	Danielle Meeker
10/22/2019	Carol Leary
10/22/2019	Nick Loconte
10/22/2019	Deborah Lalone
10/22/2019	Elaine Sullivan
10/22/2019	James Roberts
10/22/2019	Albee Schimanski
10/22/2019	Bill Curtis
10/22/2019	Isabella Tocci
10/22/2019	James Roberts
10/22/2019	William Tanner
10/22/2019	Lisa Jacobson
10/22/2019	Magdalena Ayed
10/22/2019	Jenn Goonan
10/22/2019	Patricia Dunn
10/23/2019	Judith Gundersen
10/23/2019	Donna Swanson
10/23/2019	Trudy Marsoloni
10/23/2019	Liz ORourke
10/23/2019	Linda Nelson
10/23/2019	Stacie and Brian Marley
10/23/2019	Carole Brown
10/23/2019	Scott Gagnon
10/24/2019	Hagar Shirman
10/25/2019	Christopher Pearl
10/25/2019	Wendy Corkhum
10/26/2019	Jane Moncreiff
10/26/2019	Roberta W Benton
10/26/2019	Kim Brazier
10/26/2019	David Brazier

10/27/2019	Martin Shannon
10/27/2019	Zachary Speert
10/28/2019	Layne Petrie
10/28/2019	Suzanne Knight
10/29/2019	Maria Drewnowski
10/29/2019	Scott Oakley Hersey
10/30/2019	Paul Skogstrom
10/30/2019	Jonathan Hess
10/31/2019	Christopher Marchi
10/31/2019	Amy Tai
11/03/2019	Baljinder Nijjar
11/03/2019	Jonvante Nijjar
11/03/2019	Jasmine Nijjar
11/03/2019	Sandra Nijjar
11/03/2019	Magdalena Ayed
11/04/2019	arytych@voyager.net
11/05/2019	Julia Wallerce
11/05/2019	Alyssa Vangeli
11/16/2019	Gail Miller
11/16/2019	Sonja Tengblad
11/17/2019	Anne Riesenfeld
11/17/2019	Sarah Paysnick
11/17/2019	Meredith Krebs-Smith
11/17/2019	Charles Blandy
11/18/2019	Jonathan Hess
11/18/2019	Catherine McNeil, 1st Comment
11/18/2019	Catherine McNeil, 2nd Comment
11/18/2019	Catherine McNeil, 3rd Comment
11/18/2019	Beth Battson
11/18/2019	Charles Bartoloni
11/18/2019	Anita Albright
11/18/2019	Judith Gundersen
11/18/2019	Brian Crosse
11/18/2019	Amy King
11/18/2019	Suzanne Knight
11/18/2019	Peter Dunn
11/18/2019	Johanna Bronk
11/18/2019	Allison Donelan
11/18/2019	Andrea LeBlanc
11/19/2019	Daryl Warner
11/19/2019	Ellen Daly
11/25/2019	Kevin Donahue

KAT/ACC/acc

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Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the *Terminal E Modernization Project Environmental Notification Form*

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The Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

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GOVERNOR

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LIEUTENANT GOVERNOR

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http://www.mass.gov/eea

December 16, 2015

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Terminal E Modernization
PROJECT MUNICIPALITY	: East Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15434
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: November 9, 2015

Pursuant to the Massachusetts Environmental Policy Act (M.G. L. c. 30, ss. 61-62I) and Section 11.06 of the MEPA regulations (301 CMR 11.00), I have carefully reviewed the Environmental Notification Form (ENF), comments submitted on it, and have carefully considered whether an EIR is warranted. The project is undergoing MEPA review and requires an ENF pursuant to 301 CMR 11.03(6)(b)(6) because it will be undertaken by a State Agency and consists of the expansion of an existing terminal at Logan Airport by greater than 100,000 sf. The project does not exceed a Mandatory EIR threshold. Mandatory EIR thresholds are established to identify a category of projects, or aspects thereof, for which it is presumed that the environmental impacts warrant additional analysis in an EIR.

Comments identify concerns with the project and its impacts and identify broader concerns associated with airport operations and growth. These include comments from Senator Petruccelli, Representative Madaro, and Councilor LaMattina; Representative Garett J. Bradley; the City of Boston Environment Department; the Town of Hull; the Milton Board of Selectmen; representatives of the Massport Citizens Advisory Committee (CAC); and many residents. I have weighed these concerns against the presumption that the project is not subject to a Mandatory EIR and that Massport will prepare an Environmental Assessment (EA) for review pursuant to the National Environmental Policy Act (NEPA), which will include additional opportunities for public comment.

I have determined that additional information regarding the necessary details of design and development of the Terminal E expansion is warranted to properly assess potential impacts. The Scope for the EIR is narrowly tailored to the project and its specific impacts. It is intended to

augment the federal review process, not duplicate it. The EIR is not intended to address broad concerns associated with airport operations and growth. The venue for addressing cumulative environmental impacts is through the Environmental Status and Planning Reports (ESPR) and Environmental Data Reports (EDR).

Through these reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment. This regular updating and reporting on planning and cumulative impacts is unique among State Agencies. It reflects the challenge and complexity of managing and modernizing Logan Airport within a dense, urban area. It recognizes that the proximity of communities to the Airport warrants an enhanced level of public engagement and a concerted, long-term effort to minimize and mitigate impacts.

I expect that Massport can prepare a Draft EIR that will adequately address the Scope such that I may determine, pursuant to 301 CMR 11.08, that no substantive issues remain to be addressed and allow the DEIR to be reviewed as a Final EIR (FEIR) or as a Response to Comments on the DEIR.

Project Description

The project proposes modernizing Boston-Logan International Airport's John A. Volpe International Terminal (Terminal E) with a 500,000 to 700,000-square foot (sf) addition that corrects facility deficiencies and accommodates current and anticipated passenger volumes. The project includes three gates which previously underwent MEPA review (International Gateway Project, EEA #9791) but were not constructed, and two to four additional aircraft gates, passenger holdrooms, concourse, concessions, and passenger processing areas. The project includes Customs and Border Patrol (CBP) and Federal Inspection Services (FIS) facilities to replace and expand FIS facilities that were originally reviewed under MEPA (Terminal B, Pier A Improvements/Satellite FIS Facility, EEA #12235) but also not constructed. The project also includes a direct pedestrian connection between Terminal E and the Massachusetts Bay Transportation Authority's (MBTA) Blue Line Airport Station.

Terminal E was constructed in 1974 with 12 gates and served 1.4 million annual passengers. In 2014, it served approximately five million passengers. The ENF indicates that the current level of passenger activity routinely causes severe congestion in the terminal and negatively impacts customer service and operations. During peak late afternoon and early evening periods, passengers experience severe congestion and delays at the ticket counters and security screening areas, and there is insufficient seating, concessions, and other support services. The ENF indicates that aircraft must use remote parking facilities at hardstands in the North Cargo Area and passengers are bused to the terminal during peak periods when there are insufficient gates. Massport has clearly demonstrated the need for the project and made a compelling case for the expansion.

The project is proposed in two phases. The first phase could include up to five new gates; part of the concourse extension, including the majority of the additional terminal processing area; roadway and curb improvements; and direct pedestrian connections to the MBTA Blue Line Airport Station. The second phase would primarily consist of the remainder of the concourse area, additional gates, holdrooms, boarding bridges; support spaces such as concessions, mechanical spaces, airline and airport operations spaces; and passenger processing areas. Both phases include airside modifications to accommodate aircraft maneuvering, taxiing, parking, and docking operational requirements.

The project will displace ground service equipment (GSE), other airside activities, existing surface parking, the cell phone lot, and the gas station which will be relocated within existing airport boundaries.

Environmental Status and Planning Report (ESPR)

The MEPA environmental review process for Logan Airport occurs on two levels: airport-wide and project-specific. The ESPR and EDR provide a "big picture" analysis of the environmental impacts of current and anticipated levels of airport-wide activities (including aircraft operations and passenger activity), and presents comprehensive strategies to avoid, minimize and mitigate impacts. The ESPR is generally updated on a five-year basis; the most recent ESPR for the year 2011 was filed in April 2013. Environmental Data Reports (EDRs) evaluate environmental conditions for the reporting year as compared to the previous year and are filed in the years between ESPRs. The most recent EDR for the year 2014 was filed in October 2015. The ESPR is supplemented by (and ultimately incorporates) the EDRs and the detailed analyses and mitigation commitments that emerge from project-specific reviews. This process provides a comprehensive and continuous review of airport programs, projects, environmental impacts and associated data.

The MEPA regulations (Section 11.06(2)) indicate that during the course of an ENF review I may review any relevant information from any other source to determine whether to require an EIR, and, if so, what to require in the Scope. To provide context for this project-specific review and because many issues raised by commenters relate to airport-wide operations and impacts, this Certificate refers to documents from the Environmental Status and Planning Report (ESPR) process (EEA#3247/5146). Massport indicates that the Terminal E project is consistent with the analysis presented in the Environmental Status and Planning Report (ESPR) and has incorporated that document by reference into the ENF as the framework for analyzing cumulative impacts of, and mitigation for, Logan Airport projects, and considers the regional transportation context.

The 2011 ESPR reported on key indicators of airport activity levels, the regional transportation system, ground access, noise, air quality, environmental management, and project mitigation tracking. In addition to the annual report on 2011 conditions, the ESPR evaluated the cumulative impacts of passenger growth and associated ground and aircraft operations looking forward to 2030. The ESPR also presented environmental management plans for addressing areas of environmental concern.

The 2011 ESPR identifies a future phase of the International Gateway Project – Terminal E, which includes three new gates, and assumes it is constructed by 2030. The 2012/2013 EDR also identifies this project and indicates it will be constructed beyond 2022. The 2014 EDR identifies the Terminal E Modernization Project as a stand-alone project. It indicates that it would include an additional two to four gates for a total of five to seven gates and construction could begin in 2018.

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities.

Terminal E is located adjacent to the North Cargo Area, closest to the MBTA Blue Line Airport Station. Land uses in the area of the proposed project include UPS aircraft parking and loading area, the airport's Remain Over Night aircraft parking area, the North Cargo Area equipment storage area, a building occupied by United Parcel Service (UPS), the MBTA Blue Line Airport Station, airport roadways, various short-term and cell phone parking lots, and a gas station.

The project site is located within the coastal zone of Massachusetts. The entirety of the project site is comprised of previously disturbed impervious area. It is not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The project site does not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

The ENF identified the following projects within the vicinity of Terminal E that have been reviewed under MEPA: Terminal A Replacement (EEA#9329), Terminal E Modifications (EEA#9324), Federal Inspection Services (FIS) Facility and West Concourse Project / International Gateway (EEA#9791), and Terminal B, Pier A Improvements/Satellite FIS Facility (EEA#12235).

Permitting and Jurisdiction

The project is undergoing MEPA review and requires an ENF pursuant to 301 CMR 11.03(6)(b)(6) because it will be undertaken by a State Agency and results in the expansion of an existing terminal at Logan Airport by greater than 100,000 sf.

The project requires a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC) and may require an Industrial User Permit from the Massachusetts Water Resource Authority (MWRA). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review.

The project requires approval by the Federal Aviation Administration (FAA) for changes to the Airport Layout Plan and, therefore, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the U.S. Environmental Protection Agency.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Environmental Impacts and Mitigation

The project includes construction of approximately 500,000 to 700,000 sf of new floor area (for a maximum 1,500,000 sf total), and will increase both water consumption and wastewater generation by approximately 25,600 gallons per day (76,800 gpd total). The project will not create new impervious area and will eliminate approximately 60 parking spaces. The ENF indicates that the project will accommodate existing and forecasted passenger levels and operations and, therefore, will not increase passenger enplanements or vehicle trips.

Measures to avoid, minimize and mitigate project impacts include improving high-occupancy vehicle (HOV) access to the airport via a direct pedestrian connection to the MBTA Blue Line Airport Station and reducing air emissions, greenhouse gas (GHG) emissions, and energy consumption by providing better access to gate plug-ins and pre-conditioned air. The ENF also indicates that the building will act as a noise barrier to the adjacent neighborhood and Memorial Stadium Park.

Review of the ENF

The ENF includes a general description of proposed activities, a conceptual plan, and a limited analysis of alternatives. It does not provide a typical level of information necessary to evaluate the potential environmental impacts of the project for the purpose of MEPA review. The ENF does not address why construction projections have changed compared to the ESPR and EDR or how the increase in gates may affect the impact analysis which is based on the 2011 ESPR forecasts. The ENF provides a scope for the NEPA EA that identifies further analysis and data that will be provided to assess potential impacts and measures to avoid, minimize, and mitigate these impacts. As requested by Massport, the ENF was subject to an extended 30-day comment period to provide additional time for public review and comment. C.1

Environmental Justice

Massport provided outreach consistent with the spirit and intent of the enhanced public participation provisions of the EJ Policy. Massport requested and was granted an extension of the comment period to provide additional time to review and comment on the ENF. The meeting notice was published in The Boston Herald, The East Boston Times, and the Winthrop Transcript. It was translated into Spanish and also published in El Mundo. Spanish language translation was provided at the joint MEPA/NEPA meeting held on November 19, 2015. In addition, Massport held additional meetings and presented information regarding the Terminal E Expansion at a number of meetings from September through December. I expect that Massport will employ similar approaches to ensure public review and comment of the EIR. C.2

Massport has also provided enhanced air quality analysis and assessment of cumulative impacts in the ESPR and EDRs that address the spirit and intent of the EJ Policy. The Scope for the EA indicates that it will evaluate potential disproportionate noise and air quality impacts for existing and future build years 2022 and 2030; demonstrate how it will avoid, minimize, and/or mitigate these impacts to the greatest feasible extent; and, ensure that its proposed actions will not unduly burden low income or minority areas. C.3

I have received numerous comment letters regarding environmental justice and concerns that the burden of cumulative noise, air pollution, and traffic impacts associated with growth and increased operations will be borne by neighboring communities, independent of this specific project. The Executive Office of Energy and Environmental Affairs (EEA) Environmental Justice Policy (EJ Policy) was designed to improve protection of low income and communities of color from environmental pollution as well as promote community involvement in planning and environmental decision-making to maintain and/or enhance the environmental quality of their neighborhoods.

Alternatives Analysis

The ENF identified a maximum developable footprint and indicated that all Build Alternatives will be located within previously developed land within the Airport Boundary. It did not identify a Preferred Alternative or compare relative impacts/benefits of alternatives. The ENF indicated that conceptual Build Alternatives will be developed during the NEPA permitting process based on airport industry planning standards, FAA, Customs and Border Patrol, and Transportation Security Administration (TSA) requirements that define various terminal, airside, and landside functions. C.4 The key differences among potential alternatives will relate to the internal and external layout of the building, the ability to efficiently accommodate passengers, and constructability. According to the ENF, all Build Alternatives will include phased development of three gates followed by the development of between two and four additional new gates, additional concourse with supporting facilities, a new direct pedestrian connection to the MBTA's Blue Line Airport Station, reconfiguration of adjacent roadways and short-term parking areas, and reconfiguration of some airside operations. All Build Alternatives will be located within existing paved and developed areas of the airport that are currently used for aviation or aviation-related activities.

The ENF indicates that under the No-Build alternative, passenger and aircraft operations would continue to increase as projected in the 2011 ESPR, but there would be no significant changes to Terminal E interior or exterior facilities. Gate service facilities would be inadequate to efficiently handle the increase in scheduled operations and passengers and arriving aircraft would wait on the apron with engines idling until an aircraft clears a gate or park at a "hardstand" away from the Terminal at a North Cargo Area aircraft parking area and passengers will deplane using mobile stairs and be bused to the terminal. Hardstand operations, aircraft idling, and the use of on-board diesel auxiliary power units (APU) require greater use of energy, including bussing passengers to and from the terminal, and use of the aircraft engines to provide electricity to the cabin during these ground operations. The ENF indicates that the No-Build alternative would result in insufficient passenger processing capacity, long wait times at ticketing and security, and additional congestion at the curb and roadway. Based on these considerations, the No-Build alternative was eliminated.

Comments on the ENF request Massport accommodate more demand at regional airports and evaluate regional project alternatives to the proposed project. I acknowledge that long-term strategies to mitigate Logan's impacts will continue to include an emphasis on diverting travel to regional airports and to rail. Regional transportation will continue to be addressed through the ESPR and EDR, not through this project-specific review. C.5

The 2011 ESPR and 2014 EDR provide a thorough analysis of trends in regional airport activity and identify initiatives and joint efforts to improve the efficiency of the regional transportation system (including regional rail transportation initiatives). The reports identify Massport investments in Hanscom Field and Worcester Regional Airports, consistent with the findings of the 2006 New England Regional Airport System Plan (NERASP) Study. Future ESPRs and EDRs will require Massport to report on Logan's role in the regional transportation system; Massport's efforts to promote the Worcester Regional Airport and Hanscom Field; the status of plans and improvements provided by the regional airport authorities; cooperation with other transportation agencies to promote efficient regional highway and transit operations; and, report on metropolitan and regional rail initiatives and ridership. The reports demonstrate that Massport has continued to emphasize and build on opportunities to strengthen regional transportation.

Climate Change Adaptation and Resiliency Measures

Massport recently completed a Disaster and Infrastructure Resiliency Planning (DIRP) Study and generated a Floodproofing Design Guide which are intended to improve their ability to restore operational capabilities during and after major disruptions, and to adapt and enhance facilities to be more resilient to the effects of extreme weather events. The DIRP Study identified increased storm and sea-level rise as the threats with the highest probability of occurring and impacting Massport operations. The Floodproofing Design Guide also notes that Logan Airport is increasingly susceptible to flooding hazards caused by extreme storms and rising sea levels as a result of climate change.

The ENF does not include information regarding current Federal Emergency Management Agency (FEMA) floodplain mapping. MassDEP comments note that preliminary flood mapping[1] depicts the 100-year flood zone to the west of the project site, near the Airport MBTA Station. Comments from MassDEP and CZM indicate the proximity of the project to the coastal environment may make it susceptible to sea level rise and increased storm intensity and frequency-related impacts. Massport should draw on the DIRP Study and Floodproofing Design Guide to develop mitigation strategies to support the functionality and resiliency of Terminal E in the near and distant future. I encourage Massport to consult with CZM as the project design process progresses. C.6

Greenhouse Gas Emissions

Because I am requiring an EIR, the project is subject to review under the May 2010 MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol ("the Policy"). The ENF indicates that Massport will quantify stationary and mobile source GHG emissions generated by the project and will identify measures to avoid, minimize, or mitigate GHG emissions to determine the applicability of state and federal requirements. I note that mobile sources will only include passenger vehicles and GSE. The ENF indicates that the energy demand of the project may require a new substation and that energy modeling will be used to quantify the GHG emissions for the terminal building. C.7 C.8 C.9

[1] Preliminary Flood Insurance Rate Map, Map Number 25025C0082J, March 16, 2016

Massport has incorporated sustainability into all aspects of its activities through a Sustainability Management Plan as described in the 2014 EDR. Recent Massport accomplishments include compliance with the Leading by Example Executive Order which requires state agencies to procure 15 percent of their electricity from renewable resources; the new Rental Car Center in the Southwest Service Area receiving Logan's first LEED Gold Certification in 2015; and expansion of the Logan Express Bus Service and ongoing support of HOV measures.

Noise

The ENF asserts that the project will not increase the number of aircraft operations when compared to the Future No-Build Alternative. The ENF also indicates that the proposed terminal building will act as a sound barrier to dampen or reflect noise because it will be positioned between the airfield and roadway. These benefits were not analyzed in the ENF. The ENF indicates that the EA will assess the potential for anticipated ground noise impacts resulting from proposed changes to the functioning of the North Cargo Area. The EA will also contain an analysis of the specific sound barrier benefits of the proposed terminal.

Impacts associated with existing operations and noise levels, and potential increases in impacts associated with this project and long-term growth, are a major concern identified in most comment letters. Letters identify a particular concern with nighttime noise and concentrations of flight tracks and increased flight frequency due to the FAA's area navigation (RNAV) procedures. As documented in the ESPR and annual EDR submittals, implementation of several of the RNAV procedures have generated increased noise complaints in some towns surrounding Logan Airport. The procedures themselves have resulted in aircraft at higher altitudes, though in patterns that are concentrated over certain communities. Since 2000, the number of daily aircraft operations and the number of people exposed to the 65 decibel (dB) Day-Night Average Sound Level (DNL) has declined by approximately 27 percent and fifty percent (respectively); reflecting a trend towards fewer overall flights with larger, more efficient, and quieter aircraft. I acknowledge that projected increases in flight operations will increase cumulative noise impacts compared to existing conditions, although they will remain below historic levels. Cumulative impacts will continue to be addressed through the ESPR and EDR, not through project specific review of the Terminal E project. C.10

Air Quality

The ENF indicates that the project will not alter runway use and will not affect the number of anticipated aircraft operations or generate any new vehicle trips. The project may alter airside ground operations in the North Cargo Area, including aircraft taxiing and parking, use of hardstands and busing, and use of supporting ground service equipment (GSE). The ENF indicates that an emissions inventory for the EPA criteria pollutants for airside ground operations (not flight operations) will be conducted for existing and future-year conditions using the recently released FAA Aviation Environmental Design Tool (AEDT). The AEDT will evaluate changes in aircraft ground operations and associated GSE and airside motor vehicle emissions will be assessed using the EPA MOVES model.

Total air quality emissions from all sources at Logan Airport in recent years are significantly less than they were a decade ago. The ENF attributes this downward trend to

Massport's longstanding objective to accommodate the demands of increasing passenger and cargo activity levels with fewer aircraft operations generating fewer emissions. The 2014 EDR demonstrated that total emissions are incrementally increasing. Massport will continue to assess the applicability of emissions reduction measures to the extent practicable and report on air quality in the ESPR and the EDR. C.11

Many comments cite the findings or request additional information on the 2004 Logan Airport Health Study performed by the Massachusetts Department of Public Health (DPH)[2]. The study was published in May 2014 and identified two respiratory outcomes for adults and children living in the high exposure area. In addition to contributions from Logan Airport, the study identified high background levels of air pollutants. The results of this study and have been reported in the annual EDR filings and include actions Massport is taking based on recommendations of the study. Cumulative air quality impacts will continue to be addressed through the ESPR and EDR, not through project specific review of the Terminal E project. C.12

The 2014 EDR indicates that Massport is working with DPH and the East Boston Health Center on implementing the DPH recommendations, including:

- Massport is providing funding to the East Boston Neighborhood Health Center to help expand the efforts of its asthma and chronic obstructive pulmonary disease (COPD) prevention and treatment program in East Boston and launch a program in Winthrop for screening children, providing asthma kits, and home visits;
- Massport entered into an agreement with the Massachusetts League of Community Health Centers for the evaluation and assessment of the Asthma and COPD Prevention and Treatment Program, and engagement of community health centers in the North End, Charlestown, Chelsea, and South Boston. The East Boston Neighborhood Health Center will conduct the same evaluations for the East Boston and Winthrop Community Program.
- Massport entered into an agreement with DPH to expand or establish the Asthma and COPD Prevention and Treatment Program in South Boston, the North End, Chelsea, and Charlestown in collaboration with the Massachusetts General Hospital and the South Boston Neighborhood Health Center, and to conduct training on the Community Health Worker assessments.

Transportation

The ENF asserts that the project will not increase passenger enplanements or vehicle trips to the airport, and therefore, the transportation analysis will be limited to the airport transportation network. The project will require relocation of existing uses in the project area to other airport locations. The ENF indicates that the EA will describe the existing transportation network at the airport, anticipated modifications to the transportation network, and anticipated transportation impacts of the project. According to the ENF, the EA will evaluate potential transportation impacts that may result from the relocated uses. The analysis will evaluate traffic impacts of the preferred alternative and a No-Build Alternative. The analysis will be conducted

[2] The study is available for download at http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/investigations/logan-airport-health-study.html

using the Logan Airport VISSIM model for existing and proposed conditions, with supporting traffic analyses performed using other software (Synchro and QATAR). The analysis will use the VISSIM model results from 2014 (as reported in the 2014 EDR) as the baseline year and the build conditions will be evaluated for 2022 and 2030.

The project includes construction of a direct pedestrian connection between Terminal E and the MBTA Blue Line Airport Station. The EA will include an analysis of the existing public transportation options serving the airport and evaluate the potential impacts the direct connection may have on ridership and operations. C.13

Many comments urge that I require a detailed analysis of ground transportation issues due to the cumulative impacts of landside and air operations at Logan and the identified issues with limited parking capacity. The issues of ground transportation and parking are clearly relevant to any discussion of cumulative impacts, and are an important component of any cumulative air quality analysis, which will continue to be addressed through the ESPR and EDR, not through this project specific review of the Terminal E Expansion. C.14

The ESPR and annual EDR updates include a substantial body of analysis on ground transportation issues. The 2014 EDR indicates that Massport is developing a Long-Term Parking Management Plan intended to address the parking supply, pricing and operations associated with Logan's constrained parking. Strategies to address the parking issue may have implications for design of the Terminal E Modernization project, including curbside access and/or short-term parking areas. C.15

Wastewater & Water Supply

According to the ENF, the project will generate an additional 25,600 gallons per day (gpd) of wastewater flow, for a total of 76,900 gpd. Similarly, the project will consume an additional 25,600 gpd of potable water, for a total of 76,800 gpd. MassDEP has indicated that the project will not require a Sewer Connection Permit from MassDEP. However, under the terms of the new Sewer System Extension and Connection Regulations (314 CMR 12.00), MassDEP requires that sewer authorities with permitted combined sewer overflows (CSOs), including the Boston Water and Sewer Commission (BWSC), require the removal of four gallons of infiltration and inflow (I/I) for each gallon of new wastewater flows generated by any new connection that would generate greater than 15,000 gpd. I refer Massport to comments from BWSC that provide additional guidance on this issue and identify applicable design standards for all new or relocated water mains and sewers. C.16

Comments from MWRA indicate that the project site is served by BWSC combined sewers that discharge to the MWRA's East Boston Branch Sewer. The ENF indicates that there is sufficient capacity in the existing collection system to accommodate the additional flow. I refer Massport to comments from MWRA which request the analysis also consider wet weather flow conditions. C.17

Stormwater

The ENF indicates that the project will not create new impervious area as development of the terminal will occur in an area that is already paved. The Terminal E complex will continue to drain to the North Outfall, which is equipped with end-of-pipe treatment to remove debris and floating oils and grease from stormwater prior to discharge. Comments from CZM indicate that samples from the North Outfall recently exceeded water quality standards for bacteria and recommend that Massport develop a strategy to identify and eliminate illicit sewer connections to address this issue. C.18

According to the ENF, the EA will include a drainage analysis and description of the proposed stormwater management measures and identify the size and location of stormwater management features. The EA will also demonstrate how the project will meet MassDEP Stormwater Management Standards, Logan Airport's stormwater management practices, and the requirements of the NPDES Multi-Sector General Permit under which the airport operates. I refer Massport to comments from BWSC that identify applicable design standards and plan requirements, and provide guidance on discharge of dewatering drainage. C.19

Historic and Archaeological Resources

According to the ENF, the project site does not contain any properties listed in the State or National Registers of Historic Places. The project site contains both an area and a structure that are included in the Massachusetts Historical Commission's (MHC) Inventory of Historic and Archaeological Assets of the Commonwealth (the Inventory). Specifically, the entirety of Logan Airport is identified as an Inventoried Area (MHC ID#BOS.K) and Terminal E is identified as an Inventoried Structure (MHC ID#BOS.63). The ENF contains a commitment to coordinate with MHC to identify potential impacts and avoidance, minimization, and mitigation measures.

Construction Period

The ENF does not identify specific construction period impacts or associated mitigation measures. It indicates that construction period impacts, including noise, air quality, traffic, solid and hazardous waste, and water quality will be evaluated in the EA. It will also describe project phasing and sequencing. Massport participates in MassDEP's Clean Construction Equipment Initiative and requires engine retrofits to reduce exposure to diesel exhaust fumes and particulate emissions. The ENF indicates that demolition activities will comply with MassDEP's Solid Waste and Air Quality control regulations. I refer Massport to comments from MassDEP that provide guidance on asbestos removal and the handling of asphalt, brick, and concrete. The ENF indicates Massport will recycle construction & demolition (C&D) waste. C.20

The ENF indicates that contaminated material will be managed in compliance with the Massachusetts Contingency Plan (MCP) and that a Soil Management Plan may be required to determine whether excavated soils generated through foundation construction can be used onsite or hauled off-site for reuse and/or disposal. The ENF indicates that areas near the site have been regulated under c.21E Release Tracking Number (RTN) 3-10027 (Phase V) and RTN 3-324. MassDEP comments note RTN 3-324 appears to be linked to a site in a different city. Massport should review and confirm the RTN or provide the correct RTN for the site. C.21 I refer Massport to MassDEP comments, which provide additional guidance on the excavation, removal and/or C.22

disposal of contaminated soil, pumping of contaminated groundwater, and/or working on contaminated media. C.22 Cont.

Conclusion

The ENF has provided an overview of the Terminal E Expansion, identified potential environmental impacts, and identified opportunities to avoid, minimize and mitigate impacts; however, the ENF did not provide sufficient information to demonstrate that Massport has sufficiently analyzed alternatives and measures to avoid, minimize and mitigate potential impacts of this specific proposal to the maximum extent practicable.

As noted previously, numerous comments raise concerns about the project, the management of growth at Logan Airport, the environmental and community impacts of this growth, and the mitigation of impacts. I have also received comments that suggest review of the Terminal E Modernization project has been improperly segmented under MEPA from the review of airport operations as a whole.

Massport asserts that international passenger activity is forecast to increase independent of any additional facilities. The 2011 ESPR provides accurate forecasts of passenger demand and aviation activity in 2030 and documents that demand for passenger service is primarily determined by external factors, including economic growth, cost of travel, and demographic shifts. In addition, I note that Massport has been engaged in planning to accommodate growth in international passengers and operations since the 1990's.

The issue of cumulative airport-wide impacts and segmentation is not new to the review of projects at Logan Airport. The ESPR and EDR provide a cumulative analysis of Logan Airport operations, environmental impacts, and mitigation measures. Review of individual projects proceeds within the context of this long-term planning and analysis of cumulative impacts. The record of MEPA review clearly demonstrates that Massport has and continues to identify impacts associated with individual projects within the context of long-term plans and cumulative impacts of Logan Airport. Cumulative impacts and project specific impacts will continue to be assessed on separate tracks; they will complement each other and ensure that projects are not viewed in isolation. C.23

Based on a review of the ENF, consultation with State Agencies and review of comment letters, I am requiring that Massport submit an EIR consisting of the EA and limited additional information identified in the Scope. The DEIR will consist of a project specific review of the Terminal E Modernization project within the context of airport-wide operations and impacts as a whole. The purpose of the DEIR is to:

1. Provide a detailed and comprehensive project description including conceptual design; C.24
2. Identify protect-specific impacts and the project's consistency with Logan planning and annual reporting; C.25
3. Consider how alternative building design and location, within the project site, can minimize impacts and maximize benefits; and, C.26
4. Provide draft Section 61 Findings that identify project-specific mitigation measures. C.27

Through this review, Massport will demonstrate that it has met its obligations under MEPA to avoid, minimize and mitigate impacts of the Terminal E Modernization to the maximum extent feasible.

In recognition of the comment letters that raise concerns with cumulative airport-wide impacts pertaining to traffic and parking, air quality, and noise and, consistent with the MEPA review structure for Logan Airport, I am requiring Massport to respond to comments regarding airport operations and cumulative impacts in subsequent ESPR and/or EDR documents. The next ESPR will analyze calendar year 2016 and will likely be filed in late 2017 or 2018 and the next EDR will analyze calendar year 2015 and will likely be filed in the fall of 2016. C.28

The 2015 EDR Scope includes reporting on noise, air quality, and long-term parking management. C.29 The 2016 ESPR should revise growth projections based on the changes in the Terminal E Modernization Project that occurred subsequent to the 2011 ESPR (if necessary). C.30 It should also should reflect the proposed connection to the Airport Station and identify the anticipated ridership, changes in the HOV mode share, and ground access planning considerations. C.31

SCOPE

General

The ENF included a proposed scope for the Environmental Assessment that will undergo review pursuant to the National Environmental Policy Act (NEPA). It includes a project description and permitting, alternatives, air quality, climate, coastal resources, hazardous materials, solid waste, pollution prevention, historical, architectural, archaeological and cultural resources, land use, natural resources and energy supply, noise and compatible land use, transportation, water resources, and construction impacts. In the interest of harmonizing State and federal review and in recognition of the significant and on-going planning and analysis represented by the ESPR and the EDRs, Massport may submit the EA as the Draft EIR. The EA should be supplemented by addressing the additions and modifications identified in this Scope. If Massport would prefer to tailor the EIR rather than submit the EA, the EIR should consist of the standard MEPA requirements for an EIR (Section 11.07(6)) and address the requirements of the MEPA GHG Emissions Policy and Protocol. C.32

Massport may also choose to coordinate the State and federal review. MEPA comment and review periods may be adjusted to align with NEPA deadlines. Lastly, I note that this certificate applies to the review of the project under MEPA only, and does not restrict the ability of the federal government to act on those aspects of the project subject to NEPA.

Project Description and Permitting

The EIR should identify and describe any changes to the project since the filing of the ENF and provide an update on State, local, and federal permitting. It should include a discussion of permitting requirements and document the project's consistency with regulatory standards. C.33

The EIR should include updated site plans for existing and post-development conditions at a legible scale including curbside improvements and changes to the on-airport roadways. C.34

The EIR should provide an update on consultations with the MBTA regarding the proposed connection to the MBTA Airport Station. The EIR should identify whether a Land Transfer (including easement) from MBTA will be required to construct the pedestrian connection to the MBTA Airport Station. The EIR should include a conceptual design for the proposed connection to the Airport Station and identify anticipated ridership, potential changes in the HOV mode share, and associated ground access planning considerations. C.35

Alternatives Analysis

The EIR should identify the planning metrics, facility requirements, and assumptions used to design the project and to determine the final number and location of gates. It should compare and contrast benefits and potential impacts of alternatives in narrative form and it a tabular format. C.36 The EIR should identify the peak hour used to determine gate locations and design passenger hold rooms. The EIR should identify the number of planes that are currently forced to "hard stand" during peak hours due to lack of available gates to the number of planes. It should identify the number forced to "hard stand" during peak hours under proposed alternatives. C.37 The EIR should include a discussion of the proposed project and alternatives consistency with the long-term growth forecasts contained in the ESPR and EDR. C.38

GHG Emissions and Climate Change Adaptation and Resiliency

The project is in the conceptual design state and, as such, provides meaningful opportunities for reduction GHG emissions associated with the building location, orientation and design as well as incorporation of resiliency and adaptation considerations. The EIR should describe the project's consistency with the DIRP Study and Massport's Floodproofing Design Guide to demonstrate that the project will incorporate proactive site design measures to address potential impacts related to predicted sea level rise. C.39 In addition to Massport assets, I encourage Massport to consult with the MBTA to review existing station vulnerabilities, as operations of the Blue Line and this station are important to support Massport HOV goals. C.40

The EIR should include an analysis of GHG emissions and mitigation measures in accordance with the standard requirements of the MEPA GHG Policy and Protocol. The analysis should include project-related stationary source emissions and mobile source emissions (passenger vehicles and GSE). I refer Massport to comments from DOER and MassDEP which provide additional guidance regarding mitigation measures that should be explored as part of the GHG analysis. C.41 DOER identifies combined heat and power (CHP) as a particularly promising and effective energy efficiency measure that could also support resiliency of the facility. The EIR should include a feasibility analysis of CHP and a roof-mounted solar photovoltaic (PV) system. I encourage Massport to meet with representatives from MEPA and DOER prior to preparation of the GHG analysis. C.42

Noise

The EA will include a noise analysis. The EIR should identify how the sound barrier benefits of the terminal have been maximized through its location and design. The EIR should C.43

identify whether the addition of new gates constructed to current industry standards would affect the fleet mix and, potentially, alter/increase noise and vibration on Logan Airport and within the surrounding community compared to the 2030 forecasts. C.43 Cont.

Air Quality

The EA will include an emissions inventory for the EPA criteria pollutants for airside ground operations for existing and future-year conditions to evaluate changes in aircraft ground operations and associated GSE and airside motor vehicle emissions. C.44 The EIR should quantify the impacts or benefits of providing direct access to plug-in gate operations and decreasing reliance on auxiliary power units, ground support equipment, and busing passengers around the airport. C.45 Massport should consider the potential and relative benefits of alternative building locations on the site and design between the airfield and neighborhoods as it relates to creating a potential barrier to particulate matter and other hazardous air pollutants. C.46

Construction Period

The EA IR should identify construction period impacts, including noise, air quality, traffic, solid and hazardous waste, and water quality and identify avoidance, minimization, and mitigation measures. C.47 It should also describe project phasing and sequencing. C.48

Mitigation/Draft Section 61 Findings

The EIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include draft Section 61 Findings for each area of impact associated with Massport's Preferred Alternative. The EIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation (either funding design and construction or performing actual construction), and a schedule for implementation. C.49 To ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed by the Proponent, I require Proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings included in the EIR. C.50

Responses to Comments

The EIR should contain a copy of this Certificate and a copy of each comment letter received on the ENF. Based on the large volume of comment letters received, the comment letters may be provided electronically on a CD. In order to ensure that the issues raised by commenters are addressed, the EIR should include direct responses to these comments to the extent that they are within MEPA jurisdiction. This directive is not intended, and shall not be construed, to enlarge the scope of the EIR beyond what has been expressly identified in this Certificate. The response can refer to future EDRs and/or ESPRs to address issues that are not within the DEIR Scope. C.51 In addition to items noted in the Scope, the response to comments section should address comments from MassDEP pertaining to wastewater, recycling, source reduction and water conservation efforts. C.52 The EIR should also address wet weather capacity, C.53

wastewater flows, and I/I removal requirements as outlined in MWRA and BWSC's comments. C.53 Cont. I recommend that Massport employ an indexed response to comments format, supplemented as appropriate with direct narrative response. C.54

Circulation

In accordance with Section 11.16 of the MEPA Regulations and as modified by this Certificate, Massport should circulate a hard copy of the EIR to each State and City Agency from which the Proponent will seek permits. Massport must circulate a copy of the EIR to all other parties that submitted individual written comments. Per 301 CMR 11.16(5), the Proponent may circulate copies of the EIR to these other parties in CD-ROM format or by directing commenters to a project website address. However, Massport should make available a reasonable number of hard copies to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. Massport should send correspondence accompanying the CD-ROM or website address indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. A CD-ROM copy of the filing should also be provided to the MEPA Office. A copy of the EIR should be made available for review at the following Libraries: Boston Public Library – Main, Connolly, Orient Heights, Charlestown, and East Boson Branches, Chelsea Public Library, Winthrop Public Library, Revere Public Library, Everett Public Library, Milton Public Library, and Hull Public Library. C.55

December 16, 2015
Date

Matthew A. Beaton

Comments received:

12/07/2015	Massachusetts Department of Environmental Protection – Northeast Regional Office (MassDEP)
12/07/2015	Massachusetts Water Resources Authority (MWRA)
12/07/2015	Madeleine Steczynski
12/07/2015	Jane O'Reilly
12/07/2015	Alexis Daniels
12/07/2015	Chris Marchi (1st letter)
12/07/2015	Jason Burrell
12/07/2015	John Casamassima
12/07/2015	Kannan Thiruvengadam
12/07/2015	Robin Maguire
12/07/2015	Susanna Starrett
12/07/2015	Theresa Turino
12/08/2015	Alfred Pucillo
12/08/2015	Duane Eric Lock
12/08/2015	Jeannie Grieci
12/08/2015	Joanne Donatelli
12/08/2015	Joanne T. Pomodoro

12/08/2015	John Antonellis
12/08/2015	Lisa Rusch
12/08/2015	Lorraine Curry
12/08/2015	Magdalena Ayed
12/08/2015	Mary Elizabeth Nofziger
12/08/2015	Nancy Lagro
12/08/2015	Normairiis Casiano
12/08/2015	Rebecca Lock
12/08/2015	Sandra Downey
12/08/2015	Danielle Dell'Olio
12/08/2015	Allyson and Michael Simons
12/08/2015	Patricia J D'Amore
12/08/2015	Jessica L. Curtis
12/08/2015	Daniel Cano on behalf of the Eagle Hill Civic Association and Jeffries Point Neighborhood Association (dated 12/02/15)
12/08/2015	Dan Bailey
12/08/2015	Matthew Neave
12/08/2015	Salvador Cartagena
12/08/2015	Alexis Pumphrey
12/08/2015	Jeff Lee
12/08/2015	Kelly Rusch
12/08/2015	Christine Passarriello
12/08/2015	Rick Lockney (with attached data)
12/08/2015	Camille MacLean
12/09/2015	Angela Mroz
12/09/2015	Pamela Loring
12/09/2015	Brian Gannon
12/09/2015	Jay Benson
12/09/2015	Peter Chipman
12/09/2015	Kathyrn Leeber
12/09/2015	Carol Taylor
12/09/2015	Rebecca Lynds
12/09/2015	Georges Arnaout
12/09/2015	Lisa Locke
12/09/2015	James Linthwaite
12/09/2015	Mary J. Ryan
12/09/2015	Steve and Chrissy Holt
12/09/2015	Paul Paquin
12/09/2015	Karis L. North
12/09/2015	David and Carissa Juengst
12/09/2015	Caroline Sulick
12/09/2015	Maria Graceffa
12/09/2015	Robyn Riddle
12/09/2015	Elda and Mark Prudden
12/09/2015	Christine Thompson
12/09/2015	Frank J. Ciano, Arlington Logan CAC and Massport CAC Representative
12/09/2015	Senator Petruccelli, Representative Madaro, Councilor LaMattina
12/09/2015	Elke O'Brien

12/09/2015	Jeff Kerr (1st letter)
12/09/2015	Christina Leshock
12/09/2015	Collin Cameron
12/09/2015	Aaron M. Toffler, on behalf of Airport Impact Relief, Incorporated (AIR, Inc.)
12/09/2015	Jason Hibbard
12/09/2015	Gisela Voss and Dan Kernan
12/09/2015	Elizabeth Kay
12/09/2015	Harvey Rowe
12/09/2015	Jill Romano, Wenham Logan CAC Representative
12/09/2015	Leanne Tirabassi
12/09/2015	Myron Kassaraba, Belmont Logan CAC and Massport CAC Representative
12/09/2015	Nancy Plotkin
12/09/2015	Larry A. Butler
12/09/2015	Rowan Curran
12/09/2015	Lois Freedman
12/09/2015	Kathleen Conlon, Milton Board of Selectmen
12/09/2015	Frank Kerr, Hull Neighbors for Quiet Skies
12/09/2015	Jim Roberts
12/09/2015	Tom Hardey
12/09/2015	Donna Goes
12/09/2015	Colleen MacDonald
12/09/2015	Brian Carney
12/09/2015	Billy Avalos
12/09/2015	John Walkey
12/09/2015	Stephan Marin
12/09/2015	Amelia Cardona
12/09/2015	Jeff Karr (2nd Letter)
12/09/2015	Priscilla Beadle
12/09/2015	H. Gerald Zeller
12/09/2015	Arnie Freedman
12/09/2015	Bonita K Koelker
12/09/2015	Mary Ellen Welch
12/09/2015	Marie & James Fraher
12/09/2015	Erica Mattison, Environmental League of MA, Massport CAC Representative
12/09/2015	Lynn Marie Ray
12/09/2015	Dennis Saide
12/09/2015	Vera Schneider
12/09/2015	Neill K. Ray
12/09/2015	Boston Harbor Association
12/09/2015	Nicole Al Rashid
12/09/2015	Ellen M. Tan, Commonwealth Land Trust
12/09/2015	Cindy L. Christiansen, Milton Logan CAC Representative
12/09/2015	Patricia Waddleton
12/09/2015	Evie Rose
12/09/2015	Carey Lam
12/09/2015	Kathy Beitler
12/09/2015	Joe Berkeley
12/09/2015	Eileen M. Boylen

12/09/2015 David Flynn
12/09/2015 Michael Passariello
12/09/2015 Richard Armenia
12/09/2015 James B. Lampke, Town of Hull, Acting Town Manager
12/09/2015 Cindy Borges-Peralta
12/09/2015 Stephen Cooper
12/09/2015 Tina St. Gelais Kelly
12/09/2015 Tara Ten Eyck
12/09/2015 Maria Ticona
12/09/2015 Ira Fleishman
12/09/2015 Andrew Schmidt
12/09/2015 Debbie Ellerin
12/10/2015 Jeeyoon Kim
12/10/2015 Boston Water and Sewer Commission (BWSC)
12/10/2015 George and Diane Nassopoulos
12/10/2015 Betsy Lewenberg
12/10/2015 Representative Garett J. Bradley
12/11/2015 Massachusetts Office of Coastal Zone Management (CZM)
12/11/2015 Chris Marchi, (2nd letter)
12/11/2015 City of Boston – Environmental Department
12/11/2015 Mary Beth Hamwey
12/11/2015 Maureen White
12/11/2015 Jesse Purvis
12/11/2015 John Tyler
12/11/2015 Renee MacLean
12/11/2015 Edward MacLean
12/11/2015 E.F. (45 Grovers Ave.)
12/11/2015 D.P. (402 Meridian St.)
12/11/2015 Daniel Cordon
12/11/2015 Tanya Hahnel
12/11/2015 B.R. (412 Summer St.)
12/11/2015 A.V. (198 Everett St.)
12/11/2015 Gillian B. Anderson
12/12/2015 Elizabeth Stoy
12/15/2015 Department of Energy Resources (DOER)

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Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the *Terminal E Modernization Project Draft Environmental Assessment/Environmental Impact Report*

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Executive Office of Energy and Environmental Affairs
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September 16, 2016

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Terminal E Modernization
PROJECT MUNICIPALITY	: East Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15434
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: July 20, 2016

As Secretary of Energy and Environmental Affairs, I hereby determine that the Draft Environmental Impact Report (DEIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA; M.G.L. c.30, ss.61-62I) and with its implementing regulations (301 CMR 11.00). Consistent with Section 11.08 (8)(b)(2)(b) of the MEPA regulations, I am requiring the Proponent to file responses to comments on the DEIR and draft Section 61 Findings. The responses to comments and draft Section 61 Findings shall be filed, circulated, and reviewed as a Final Environmental Impact Report (FEIR). C.1

Comments on the DEIR reflect myriad concerns regarding existing airport operations and noise levels and potential increases in impacts associated with long-term growth. I have received comment letters from elected officials, including U.S. Congressman Michael E. Capuano, State Senator Joseph Boncore, State Representative Adrian Madaro, Boston City Councilor Salvatore LaMattina, and Chelsea City Councilor Roy Avellaneda. Comments were also submitted by municipalities, State and regional agencies, environmental advocacy groups, businesses and residents. The issue of cumulative airport-wide impacts, particularly noise and air quality, is not new to the review of projects at Logan Airport. As noted in past Certificates, the EIR is not intended to address broad concerns associated with airport operations and growth. The venue for addressing cumulative environmental impacts is through the Environmental Status and Planning Reports (ESPR) and Environmental Data Reports (EDR). Through these reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment on the cumulative impacts. This regular updating and reporting on planning and cumulative impacts is unique among State Agencies. It reflects the challenge and complexity of

managing and modernizing Logan Airport within a dense, urban area. It recognizes that the proximity of communities to the Airport warrants an enhanced level of public engagement and a concerted, long-term effort to minimize and mitigate impacts.

Subsequent ESPRs and EDRs will update the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts and update and revise environmental management plans to address impacts. Future submittals will continue to document potential impacts and trends and propose measures to implement the broad goal of maintaining or reducing Logan's overall environmental impacts, even as annual passenger volumes rise in the future. The next ESPR will analyze calendar year 2016 and will likely be filed in 2017 or 2018 and the next EDR will analyze calendar year 2015 and will likely be filed in the fall of 2016. C.2 C.3

Over the past year, Massport has engaged in a concerted outreach effort with elected officials, municipalities and community groups to identify and discuss potential Massport projects, including but not limited to, Terminal E. Massport created the Logan Airport Impact Advisory Group (IAG) to solicit comment and to identify and prioritize projects and programs of significance to the IAG. One project prioritized through this process is the construction of a pedestrian connection between the Massachusetts Bay Transportation Authority (MBTA) Blue Line Airport Station to Terminal E. Massport has incorporated this connection into the Terminal E project. I commend Massport for its outreach efforts which have been beneficial to informing the MEPA process. I encourage Massport to continue a productive dialogue with interested stakeholders, including through the IAG. C.4

Project Description

The project proposes modernizing Boston-Logan International Airport's John A. Volpe International Terminal (Terminal E) with a 560,000-square foot (sf) addition that corrects facility deficiencies and accommodates current and anticipated passenger volumes. The project includes three gates which previously underwent MEPA review (International Gateway Project, EEA #9791) but were not constructed, and four additional aircraft gates, passenger holdrooms, concourse, concessions, and passenger processing areas. The project includes Customs and Border Patrol (CBP) and Federal Inspection Services (FIS) facilities to replace and expand FIS facilities that were originally reviewed under MEPA (Terminal B, Pier A Improvements/Satellite FIS Facility, EEA #12235) but also not constructed. The project includes a direct pedestrian connection between Terminal E and the MBTA Blue Line Airport Station.

Terminal E was constructed in 1974 with 12 gates and served 1.4 million annual passengers. In 2014, it served approximately five million passengers. The DEIR indicates that the current level of passenger activity routinely causes severe congestion in the terminal at peak times, leading to greatly reduced customer service, and inefficient operations in the terminal and gates. According to the DEIR, gate congestion leads to airside delays and inefficiencies on the North Apron. When no gates are available, arriving aircraft and passengers are held on the apron. The DEIR indicates that aircraft must use remote parking facilities at hardstands in the North Cargo Area and passengers are bused to the terminal during peak periods when there are insufficient gates. The DEIR builds upon the information presented in the ENF regarding challenges associated with current operations at Terminal E. Massport has clearly demonstrated the need for the project and made a compelling case for the expansion.

The DEIR provided additional information to clarify and revise project phasing. The project is proposed in two phases. Phase 1 will be constructed from 2018 – 2022 and will include construction of four new gates with associated passenger holdrooms and elevators/escalators to relieve existing deficiencies and accommodate interim growth. A partial new concourse will be constructed to allow for future expansion to a seven-gate facility at full build-out. Phase 1 will not require modifications to roadway realignment. Phase 2 will be built by 2028 and will provide three additional gates and the MBTA connection. The DEIR indicates the project will be fully constructed and operational by 2030. Due to planning and budget constraints, the MBTA pedestrian connection has been shifted from Phase 1 as proposed in the ENF to Phase 2. The DEIR indicates that no other significant changes have occurred since the ENF was filed.

The project will displace ground service equipment (GSE), other airside activities, existing surface parking, the cell phone lot, and the gas station which will be relocated within existing airport boundaries. Relocation of ground facilities that conflict with the new concourse location, including the gas station, will occur in Phase 1.

Environmental Status and Planning Report (ESPR) and Environmental Data Reports (EDRs)

The MEPA environmental review process for Logan Airport occurs on two levels: airport-wide and project-specific. The ESPR and EDR provide a "big picture" analysis of the environmental impacts of current and anticipated levels of airport-wide activities (including aircraft operations and passenger activity), and presents comprehensive strategies to avoid, minimize and mitigate impacts. The ESPR is generally updated on a five-year basis; the most recent ESPR for the year 2011 was filed in April 2013 and it contained updated passenger activity levels and aircraft operations forecasts through 2030. EDRs evaluate environmental conditions for the reporting year as compared to the previous year and are filed in the years between ESPRs. The most recent EDR for the year 2014 was filed in October 2015. The EDR provided a comprehensive cumulative analysis of the effects of all Logan Airport activities based on actual passenger activity and aircraft operation levels in 2014 and presents environmental management plans for addressing environmental impacts. The ESPR is supplemented by (and ultimately incorporates) the EDRs and the detailed analyses and mitigation commitments that emerge from project-specific reviews. This process provides a comprehensive and continuous review of airport programs, projects, environmental impacts and associated data.

The 2015 EDR Scope includes, but is not limited to, reporting on noise, air quality, and long-term parking management. The 2015 EDR and 2016 ESPR should reflect the proposed connection to the Airport Station, provide updates on the planning and design of the connection, and identify the anticipated ridership, changes in the HOV mode share, and ground access planning considerations. C.5

The MEPA regulations (Section 11.06(2)) indicate that during the course of an ENF review I may review any relevant information from any other source to determine whether to require an EIR, and, if so, what to require in the Scope. To provide context for this project-specific review and because many issues raised by commenters relate to airport-wide operations and impacts, this Certificate refers to documents from the ESPR process (EEA#3247/5146).

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities.

Terminal E is located adjacent to the North Cargo Area, closest to the MBTA Blue Line Airport Station. Land uses in the area of the proposed project include UPS aircraft parking and loading area, the airport's Remain Over Night aircraft parking area, the North Cargo Area equipment storage area, a building occupied by United Parcel Service (UPS), the MBTA Blue Line Airport Station, airport roadways, various short-term and cell phone parking lots, and a gas station.

The project site is located within the coastal zone of Massachusetts. The entirety of the project site is comprised of previously disturbed impervious area. It is not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The project site does not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

The ENF identified the following projects within the vicinity of Terminal E that have been reviewed under MEPA: Terminal A Replacement (EEA#9329), Terminal E Modifications (EEA#9324), Federal Inspection Services (FIS) Facility and West Concourse Project / International Gateway (EEA#9791), and Terminal B, Pier A Improvements/Satellite FIS Facility (EEA#12235).

Permitting and Jurisdiction

The project is undergoing MEPA review and required an ENF pursuant to 301 CMR 11.03(6)(b)(6) because it will be undertaken by a State Agency and results in the expansion of an existing terminal at Logan Airport by greater than 100,000 sf.

The project requires a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC) and may require an Industrial User Permit from the Massachusetts Water Resource Authority (MWRA). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review.

The project requires approval by the Federal Aviation Administration (FAA) for changes to the Airport Layout Plan and, therefore, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the U.S. Environmental Protection Agency.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Environmental Impacts and Mitigation

As described in the ENF, the project includes construction of approximately 500,000 to 700,000 sf of new floor area (for a maximum 1,500,000 sf total), and will increase both water consumption and wastewater generation by approximately 25,600 gallons per day (76,800 gpd total). The project will not create new impervious area and will eliminate approximately 60 parking spaces. The DEIR indicates that the project will accommodate existing and forecasted passenger levels and operations and, therefore, will not increase passenger enplanements or vehicle trips.

Measures to avoid, minimize and mitigate project impacts include reducing air emissions, greenhouse gas (GHG) emissions, and energy consumption compared to existing conditions by improving access to gate plug-ins, pre-conditioned air, and reducing busing operations. In addition, the building is designed to act as a noise barrier to the adjacent residential areas and Memorial Stadium Park.

Review of the DEIR

The DEIR has been filed to provide additional information regarding the necessary details of design and development of the Terminal E expansion to support assessment of potential impacts and has been coordinated with the federal NEPA process. In accordance with my Certificate on the ENF, the Environmental Assessment (EA) as required under NEPA formed the basis of the DEIR.[1] This Certificate applies to the review of the project under MEPA only, and does not restrict the ability of the federal government to act on those aspects of the project subject to NEPA. The DEIR included FAA's draft Finding of No Significant Impact (FONSI). The DEIR described the proposed project, identified existing conditions, described potential environmental impacts and mitigation measures, and provided an expanded discussion of alternatives. It included an update on state, local, and federal permitting and provided a discussion of permitting requirements and the project's consistency with regulatory standards. At Massport's request, the comment period was extended by three weeks to September 9, 2016. C.6

The DEIR identified ongoing projects that are currently under construction and are assumed to be completed prior to commencement of construction for the Terminal E Project. It also identified a potential parking garage, which is predicated on the approval of a draft regulatory change by MassDEP to amend the Logan Airport Parking Freeze Regulation (310 CMR 7.30). The DEIR indicates that the potential parking garage will be subject to MEPA review pursuant to 301 CMR (6)(a)(7) because it will be constructed by a State Agency and will include construction of 1,000 or more new parking spaces. This project is conceptual in nature and the DEIR did not provide a schedule or timeline for its design or construction or for initiating MEPA review. I encourage Massport to consult with the MEPA Office prior to preparing an ENF for this project. C.7

[1] The Federal Aviation Administration (FAA) is reviewing the project as an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA).

Environmental Justice Policy

I have received numerous comment letters regarding environmental justice and concerns that the burden of cumulative noise, air pollution, and traffic impacts associated with growth and increased operations will be borne by neighboring communities, independent of this specific project. The Executive Office of Energy and Environmental Affairs (EEA) Environmental Justice Policy (EJ Policy) was designed to improve protection of low income and communities of color from environmental pollution as well as promote community involvement in planning and environmental decision-making to maintain and/or enhance the environmental quality of their neighborhoods. Massport provided outreach consistent with the spirit and intent of the enhanced public participation provisions of the EJ Policy. Massport requested and was granted an extension of the comment period to provide additional time to review and comment on the DEIR. The meeting notice was published in English and Spanish in the Boston Herald and the East Boston Times. Spanish language translation was also provided at a Public Information Meeting held the evening of August 10, 2016 at the Mario Umana Middle School Academy Auditorium in East Boston. I received many comment letters requesting Massport provide a Spanish language version of the Executive Summary provided with the DEIR filing. Massport has indicated it will provide a Spanish translation of the DEIR Executive Summary. I encourage Massport to continue providing translated Executive Summaries with all future MEPA filings. C.8

Alternatives Analysis

The DEIR included an expanded alternatives analysis that identified the planning metrics, facility requirements, and assumptions used to design the project and to determine the final number of gates based on the passenger projections for year 2030. The DEIR provided a gating analysis for forecast passenger activity and aircraft operations levels to determine the number of gates required to accommodate the volumes of passengers and aircraft that will be arriving and departing at Terminal E during the average weekday peak-hours. As described in the DEIR, Massport has limited control over the scheduling of transatlantic flights, which are subject to lengthy flight times and time zone changes that cause arrival and departure peaks to occur within a relatively short time period. The DEIR indicates that peak hour for international departures will be between 9:00 pm to 10:00 pm and the peak hour for international arrivals will be between 6:00 pm and 7:00 pm. According to the DEIR, approximately 1,954 passengers are projected to depart in 2030 during the peak hour (9:00 pm to 10:00 pm) and 1,885 passengers are projected to arrive during the peak hour (6:00 pm to 7:00 pm). Based on this, the gating analysis indicates that Logan Airport will require an additional seven gates for a total of 19 gates to efficiently support international operations.

The DEIR identified the number of planes that are forced to "hard stand" during peak hours due to lack of available gates under existing, future No-Build, and future Build-Conditions. As described in the DEIR, in the summer of 2015, aircraft scheduling demanded 13 gates, one more than the existing twelve gates. Throughout 2015, only 10 of the existing 12 Terminal E gates were available for use as two were decommissioned to allow for construction of the Terminal E Renovation and Enhancements Project. From April to September 2015, facility constraints at Terminal E resulted in 293 gate-delays, which affected approximately 44,000 passengers and 49 ramp busing operations to remote hardstands which affected over 8,200 passengers. As described in the DEIR, aircraft waiting for gates account for 55-percent of total delays at Terminal E, while busing operations to remote hardstands account for 11-percent of total delays. According to the DEIR, in the proposed (2030) Build-Condition, only two operations will require use of a "hard stand" and busing, whereas under the No-Build, 17 flights (arrival and departure) per day will require busing operations. The DEIR also included a summary of key aircraft gate and passenger terminal area facility program requirements for the proposed project to address current deficiencies and meet the needs for future anticipated aircraft and passenger handling.

The DEIR evaluated the following alternate configurations of the new terminal area and the North Apron:

- Alternative A: Separate Core Terminal – New linear concourse and terminal core, with new separate curb frontage.
- Alternative B: Concourse Extension – Extension from existing concourse extending westward from the Gate 12 area at the west end of Terminal E.
- Alternative C: Satellite Concourse – New portion of the terminal positioned as a separate two-sided concourse structure with underground passageway connecting the new gates to the existing terminal space.
- Alternative D: Extended Core Terminal *(Preferred Alternative)* – New extension of the existing concourse, terminal core, and terminal frontages.

Each alternative included seven new gates consistent with the need identified in the gating analysis. The key differences among the terminal configuration alternatives relate to efficiency of interior operations, frontage on the adjacent roadway, disruption to the existing operations during construction, and cost. With the exception of the ability to buffer ground noise from ground operations, there is little difference in environmental impacts among the alternatives. Alternative D was selected as it provides the greatest passenger processing efficiency, interior space, and noise buffering benefits compared to the other alternatives. Massport also evaluated three alternative roadway configurations based on the preferred terminal configuration. The three roadway alternatives (Bi-Level S-Curves, Single S-Curve, and Northern Loop Ramps) all extend the roadway frontage to facilitate drop-off and pick-up along the new building area, and realign the roadway ramps servicing Terminal E. The DEIR indicates that the roadway configurations have similar environmental impacts since the limit of work is currently fully developed and that all build options will replicate the existing traffic flow patterns. The Preferred Alternative (Single S-Curve) was selected as it provides the best alignment for traffic operations while minimizing the overall footprint.

Comments on the DEIR continue to request that Massport accommodate more demand at regional airports in lieu of or in conjunction with the proposed project. I acknowledge that long-term strategies to mitigate Logan's impacts will continue to include an emphasis on diverting travel to regional airports and to rail. As indicated in the Certificate on the ENF, regional transportation will continue to be addressed through the ESPR and EDR, not through this project specific review. C.9

GHG Emissions

Because I required an EIR, the project is subject to review under the May 2010 MEPA Greenhouse Gas (GHG) Emissions Policy and Protocol ("the Policy"). The DEIR included an analysis of GHG emissions and mitigation measures that is generally in accordance with the standard requirements of the MEPA GHG Policy and Protocol; however, the FEIR must address C.10

several issues. The DEIR did not address many of the comments and recommendations provided in the DOER ENF comment letter. I refer Massport to DOER's comment letter. In addition, discrepancies exist between the mitigation measures presented in Table 6-1 (Summary of Terminal E Modernization Beneficial Measures), the "Sustainability Features" narrative (Section 6.2.2), the Draft Section 61 Findings (Appendix B), and the information provided in the MEPA Greenhouse Gas Analysis Technical Report (Appendix G). It is unclear which GHG reduction measures have been committed to by the Proponent and which will continue to be evaluated. For example, many measures included in Table 6-1 which summarizes Massport's commitments to beneficial measures are subsequently referred to (in Section 6.2.2 of the narrative) as measures "to-be considered for their feasibility and applicability" during the preliminary design phase and later design phases. As indicated below, the Response to Comments must provide a detailed response to address each of the issues identified in DOER's comment letter and draft Section 61 Findings should be revised accordingly. C.11 C.12 C.13

The Base Case scenario is based on the 8th Edition of the Massachusetts Building Code that includes the International Energy Conservation Code 2012. The eQUEST v.3.64 modeling software was used to perform the GHG analysis. The DEIR indicates that Massport will build the Terminal E project to achieve LEED Silver or higher certification. The DEIR summarized the following design mitigation measures that were modeled in the GHG analysis and proposed for adoption by the Proponent:

- Improved building envelope (wall insulation of U-0.05, roof insulation of U-0.037, improved glazing of U-0.34, and reduced window to wall ration of 25%)
- Improved Air Handling Units (Variable Air Volume with reduced fan power per cfm; dual enthalpy air economizer to maximize benefit of using outdoor air to condition the building; automatic rest of fan static pressure and supply air temperature based on space loading to reduce fan power, cooling energy, and heating energy);
- Efficient water loops with reduced water supply temperature and wider return temperatures to reduce demand on the pumping and fan systems; and
- Reduced interior lighting power density (LPD) of 0.62 W/SF and reduced exterior lighting power of 9.3 kW.

C.14

These design measures were not identified in Table 6-1 or specifically identified in the draft Section 61 Findings. They should be incorporated into revised draft Section 61 Findings. The DEIR identifies the several energy conservation measures that were considered and eliminated primarily for concerns regarding constructability, ease of operations and maintenance and cost. Measures that were eliminated include automated reflective interior blinds to reduce solar heat gain, geothermal heat pumps, fan cycling based on occupancy load, and combined heat and power (CHP). I refer the Proponent to DOER' s comment letter which recommends further evaluation of CHP to address Terminal E's service water loads. Massport has indicated that conversion of the equipment at Logan's Central Heating and Cooling Plant will be evaluated as the equipment reaches the end of its useful life. I expect that further evaluation of CHP will be evaluated as part of that process and reported in future EDRs and ESPRS. C.15 C.16 C.17

Massport has committed to evaluate the following energy efficiency measures as project design progresses: dual box minimum, fin tube radiation, energy recovery wheel, dynamic V8 filtration, and implementation of a solar photovoltaic (pv) array. According to the DEIR, these C.18

measures could increase energy savings by 70% compared to the currently proposed project. C.18 However, the DEIR does not indicate why these mitigation measures cannot be incorporated into the project design at this time nor does it identify the additional analysis that would be required to inform a determination during subsequent design. C.19 In addition, Section 6.2.2 of the DEIR notes that Massport will investigate the feasibility of providing 2.5% of the project's power with on-site renewable energy through the use of Solar PV; and the Greenhouse Gas Analysis Technical Report (Appendix G) indicates that a 300 kW solar PV array may continue to be evaluated for inclusion in the project. As part of this evaluation, Massport should identify the total rooftop area available for a potential solar PV array and perform a financial feasibility analysis. To date Massport has installed a total of approximately 916 kW of solar PV at Logan and Hanscom airports. The FEIR should identify the basis for delaying a decision regarding installation of a C.20 solar PV project on the rooftop of Terminal E or, at a minimum, re-affirm the commitment to build it as "solar ready" until subsequent design phases. C.21

Stationary source GHG emissions associated with the energy use of the proposed Terminal E expansion are estimated to generate 5,850 tpy of CO_2 in the Base Case Scenario. Through the adoption of energy efficiency measures, the Preferred Alternative will reduce CO_2 emissions associated with the terminal expansion by 685 tpy, for a total of 5,165 tpy, or a 11.7 percent decrease. The GHG analysis also evaluated total net new GHG emissions from aircraft, GSE, airside ground access vehicles, and additional energy demand associated with the Terminal E expansion. The FAA's Aviation Environmental Design Tool (AEDT) and EPA's MOVES and NONROAD models were used to calculate the GHG emissions associated with the operations, including aircraft engines, GSE/auxiliary power units (APUs), and ground access vehicles. Changes to operations are estimated to reduce GHG emissions by an additional 5,371 tpy.

Climate Change Adaptation and Resiliency

The DEIR described the project's consistency with Massport's Disaster and Infrastructure Resiliency Planning (DIRP) Study and Floodproofing Design Guide. Terminal E will be above the projected 2070 coastal flood elevation. The Design Guide establishes Design Flood Elevations (DFEs) that are more conservative than existing building code requirements. The DEIR indicates that the first level of the project and associated utilities and critical equipment is generally located above the DFE. In areas where spaces must be located below the DFE, critical areas will be flood proofed or protected through use of the following measures: watertight shields on doors, windows, and louvers; exterior and interior membranes and sealants; drainage collection systems and sump pumps; early warning devices to monitor water levels; sealing electrical conduits and other utilities; back-flow preventer valves on drainage and sanitary sewer piping; and use of flood openings to equalize hydrostatic pressure. The DEIR notes that Massport has consulted with CZM regarding development of coastal resiliency design measures. Massport will continue consultations with CZM and MBTA and to review existing station vulnerabilities, as operations of the Blue Line and this station are important to support Massport HOV goals. C.22 Updates on this consultation and the design measures that are considered and/or incorporated into the design to improve the MBTA station's coastal resiliency should be provided in the EDR and ESPR documents.

Air Quality

The DEIR included an analysis to determine whether and to what extent the proposed project will increase criteria pollutants. The analysis evaluated changes in emissions from aircraft engines, APUs and GSE, airside vehicles, and airport passenger and employee motor vehicles under the 2030 No-Build and 2030 Build scenarios. The FAA's AEDT was used to evaluate changes in emissions from aircraft ground operations. EPA's MOVES and NONROAD models were used to evaluate changes in emissions from ground support equipment and motor vehicle emissions. Results of the analysis indicate that total emissions of all pollutants will decrease within the project area under future conditions with the proposed project compared to future conditions without the project.

	Carbon Monoxide	Volatile Organic Compounds	Nitrogen Oxides	Sulfur Oxides	Particulate Matter$_{10}$	Particulate Matter$_{25}$
2030 No-Build	294 tpy	35 tpy	59 tpy	9 tpy	11 tpy	4 tpy
2030 Build Condition	268 tpy	33 tpy	33 tpy	6 tpy	10 tpy	3 tpy
Percent Change	-9%	-6%	-44%	-33%	-9%	-25%

The DEIR indicates that the reductions are largely due to the availability and use of gate-furnished electricity and air conditioning rather than APUs while parked at hardstands; reduced reliance on GSE to transport passengers, baggage, and cargo; and improved aircraft operational conditions (e.g., less congestion and delay) on the taxiways and aprons. The DEIR indicates that project complies with the applicable emission thresholds contained in the State Implementation Plan (SIP) and will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS). The DEIR quantified temporary construction-related impacts and confirmed that construction-related emissions will not exceed applicable emission thresholds.

Total air quality emissions from all sources at Logan Airport in recent years are significantly less than they were a decade ago; however, the 2014 EDR demonstrated that total emissions are increasing incrementally. The overall reduction is associated with industry trends of accommodating the demands of increasing passenger and cargo activity levels with fewer aircraft operations generating fewer emissions. Massport will continue to assess the applicability of emissions reduction measures to the extent practicable and report on air quality in the ESPR and the EDR. C.23

Noise

The DEIR asserts that the project will not result in any changes to the number and type of aircraft operations when compared to the Future No-Build Alternative. It indicates that demand is driven by economic and market factors; and, therefore, growth at Logan Airport will continue to occur regardless of the Terminal E project. Cumulative impacts will continue to be addressed through the ESPR and EDR. C.24

The DEIR included a noise evaluation which evaluated project-related ground noise conditions and the ability of the terminal extension to mitigate noise. The noise model also identified how changes in the use of Terminal E gates and the North Cargo Area will affect ground noise levels. The extension of Terminal E has been designed to provide a noise barrier between the airport and the community. It will result in reduced noise levels at Jeffries Point, East Boston Memorial Park, and most residential areas in East Boston west of the ramp areas between Route 1A and Putnam Street. Specifically, the project will reduce noise from aircraft ground operations near Terminal E by five to 18 dB and from single event maximum noise levels by two to 15 dB in the Jefferies Point neighborhood. It will reduce noise from aircraft ground operations near Terminal E by three to 15 dB and from single event maximum noise levels by 1 to eleven dB in the Bremen Street area south of Putnam Street to Route 1A. The DEIR indicates that the project will not result in a significant noise increase within the Day-Night Average Sound Level (DNL) 65 dB contour.

I received many letters which identify a particular concern with concentrations of flight tracks and increased flight frequency due to the FAA's area navigation (RNAV) procedures. The primary purpose of the RNAV procedures is to increase safety and operational efficiency. As documented in the ESPR and annual EDR submittals, implementation of several of the RNAV procedures have generated increased noise complaints in some towns surrounding Logan Airport and I have received many comment letters from residents of the Town of Hull on this issue. The procedures themselves have resulted in aircraft at higher altitudes although patterns are concentrated over certain communities. I note that the FAA is implementing the RNAV program nation-wide. This program is separate from and unrelated to the Terminal E Modernization project. Through my review of the ESPR and EDRs, I am aware of The Boston Logan Airport Noise Study (BLANS)[2]; an ongoing and joint effort between the FAA, Massport, and the Logan Airport Citizen Advisory Committee (CAC). The RNAV procedures to Runways 27, 4L, and 33L were subject to review during Phase 3 of the BLANS[3]. The purpose of Phase 3, currently underway, is to identify opportunities to balance the use of Logan's runways and reduce persistent noise over communities. Flight operations are significantly lower than historic levels; however, I acknowledge that projected increases in flight operations will increase cumulative noise impacts compared to existing conditions. As noted previously, the ESPR and EDRs provide a forum and meaningful opportunities for public review of information and analysis related to these issues. I also encourage residents to contact their CAC representatives to identify additional methods to participate in improving the noise environment around Boston-Logan Airport.

C.25

C.26

Construction Period

The DEIR provided additional construction phase information (presented below in the Mitigation Measures section) to identify construction period impacts and measures to control construction traffic, air quality, noise, and water quality impacts.

Mitigation/Draft Section 61 Findings

The DEIR contained a separate chapter on mitigation measures and provided draft Section 61 Findings in an Appendix. It generally describes mitigation measures and contains commitments to mitigation. As noted earlier, additional clarity is necessary regarding those

C.27

[2]Information on the Boston Logan Airport Noise Study can be found at http://www.bostonoverflight.com/index.aspx
[3] These environmental documents can be found at http://www.bostonoverflight.com/phase3_documents.aspx

measures that are commitments and those that will be evaluated as project design progresses. This is particularly relevant to the GHG mitigation measures. The Proponent has committed to implement the following measures to avoid, minimize, and mitigate environmental impacts:

C.27 Cont.

Operational Impacts

- The Terminal E expansion has been sited and will be designed to act as a noise barrier to the adjacent East Boston neighborhoods and Memorial Stadium park to the southwest of the North Apron. The new structures will have a minimum height of 45-ft above ground level.
- New gates will have electric power and pre-conditioned air to allow aircraft to plug in at gate rather than be serviced remotely to reduce need for on-board engine/auxiliary power unit operation, thereby reducing aircraft air emissions and GHG emissions.
- New gates will increase ramp efficiency and reduce movements on North Apron and the need to bus passengers between terminal and remote aircraft parking locations, thereby reducing ground transportation related air emissions and mobile source GHG emissions.
- Roadway and curb improvements which will improve vehicle flow and high-occupancy vehicle access.

Sustainable Design Features/Greenhouse Gas Emissions

- Improved building envelope (wall insulation of U-0.05, roof insulation of U-0.037, improved glazing of U-0.34, and reduced window to wall ratio of 25%).
- Improved Air Handling Units.
- Efficient water loops with reduced water supply temperature and wider return temperatures to reduce demand on the pumping and fan systems.
- Reduced interior lighting power density of 0.62 W/SF and reduced exterior lighting power of 9.3 kW.
- The roof design will incorporate materials with a minimum reflectance rating of 0.70 and emittance value of at least 0.75 for a minimum of 75% of the available roof area. Roofing materials will be non-glare to reduce heat island effect.
- Final design will incorporate infrastructure for collection, storage, and handling of recyclable materials.
- The contractor will be required to develop a construction waste management plan that requires diversion or reduction of construction waste by at least 75%.
- Massport will establish a project-specific goal for sourcing materials extracted, harvested, recovered, and or manufactured within New England.
- The project will be designed to achieve energy efficiencies of a minimum of 20% below the MA Energy Code.
- Continued investigation into the feasibility of supplying 2.5% of the project's power with on-site renewable energy systems.
- The project will be developed to accommodate rooftop solar.
- Project will include water conservation devices that reduce water use by 20% below the MA Plumbing Code.
- Project will incorporate occupancy sensors in all indoor areas to reduce electrical demand.

Construction Period

- Work hours will be limited to 7:00 AM to 5:00 PM unless constrained by operational conditions at the Airport.

- Adequate storage areas for construction supplies will be maintained on airport property.
- Soil Management Plan will be developed based on sub-surface investigations to address identification and disposal of contaminated materials.
- Stormwater Pollution Prevention Plan will be developed to keep sediment and contaminants out of the stormwater management system during construction.
- Management Plan for Dewatering will be developed (if required) to address requirements for testing, handling, and treatment prior to discharge of contaminated groundwater.
- Rodent control, inspection, monitoring, and treatment will be carried out before, during, and after completion of all foundation and utilities demolition and construction work. Rodent extermination prior to work will consist of treatment throughout the project area, including building exteriors and interiors and will continue throughout construction.
- Noise control techniques will be used to reduce noise from pile driving by at least 5 A-weighted decibels (dBA) below unmitigated levels through enclosing the point of impact for the pile drive; installation of an impact cushion between the pile drive and the pile; or requiring the application of energy-absorbing material to steel piles.
- Measures to reduce ground transportation impacts from project construction include:
  - Designated truck routes designed to keep construction-related traffic off of residential streets unless they are seeking construction-related access to or from local businesses.
  - Concrete production/batching will occur in existing plants with access to Route 1A or I-90 to reduce on-airport activities and to consolidate truck trips.
  - Construction companies will be encouraged to provide off-Airport parking for their employees and to provide shuttle services from these locations.
- The following measures will address construction phase air quality impacts:
  - Enforcement of construction vehicle anti-idling provisions;
  - Retrofitting diesel construction equipment with diesel oxidation catalysts and/or particulate filters;
  - Fugitive dust will be controlled via wetting or sweeping and all trucks hauling materials from the construction site will be covered.

Responses to Comments

The Response to Comments should contain a copy of this Certificate and a copy of each comment letter received on the DEIR. Comment letters may be provided electronically on a CD. As many of the comment letters identify similar concerns, the FEIR may contain a thematic response to comments to the extent that they are within MEPA jurisdiction. The response can also refer to future EDRs and/or ESPRs to address issues that are not within the Scope of this review. This directive is not intended, and shall not be construed, to enlarge the scope beyond what has been expressly identified in this Certificate. I recommend that Massport employ an indexed response to comments format, supplemented as appropriate with direct narrative response. C.28 C.29 C.30 C.31 C.32 C.33

The response to comments section should address specific comments from DOER and a revised GHG analysis should be provided, if necessary to provide a meaningful response. The Response to Comments should clarify GHG reduction measures and to demonstrate that GHG emissions will be minimized, avoided, and mitigated to the maximum extent practicable. I expect that the FEIR will provide a comprehensive and thoughtful response to the DOER comment letter and that Massport will consult with DOER prior to filing the Response to Comments. C.34 C.35 C.36

Mitigation/Draft Section 61 Findings

The Response to Comments should include revised draft Section 61 Findings which should include a complete list of all mitigation measures developed through MEPA review of the project, including but not limited to, measures specifically incorporated into the terminal design or operational measures to minimize GHG emissions. The Section 61 findings should clarify which GHG mitigation measures are proposed as mitigation and which will continue to be evaluated. It should reconcile the data contained in Table 6-1, Sustainability Features narrative in Section 6.2.2, and the information provided in the GHG Analysis Technical Report (Appendix G). The revised draft Section 61 Findings should clarify the reduction in GHG emissions (compared to the base case) that is being committed to as mitigation. The draft Section 61 Findings should also identify whether each mitigation commitment will be incorporated or provided as part of Phase 1, Phase 2, or both phases of the project. C.37 C.38 C.39 C.40

To ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed, I require proponents to provide a self-certification to the MEPA Office. Specifically, Massport must provide a certification to the MEPA Office signed by an appropriate professional (e.g., engineer, architect, transportation planner, general contractor) indicating that the all of the mitigation measures proposed in the EIR have been incorporated into the project. Alternatively, Massport may certify that equivalent emissions reduction measures that collectively are designed to reduce GHG emissions by the same percentage as the measures outlined in the EIR, based on the same modeling assumptions, have been adopted. The certification should be supported by plans that clearly illustrate where GHG mitigation measures have been incorporated. For those measures that are operational in nature (i.e. TDM) the Proponent should provide an updated plan identifying the measures, the schedule for implementation and how progress towards achieving the measures will be obtained. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings included in the EIR. C.41 C.42 C.43

Circulation

In accordance with Section 11.16 of the MEPA Regulations and as modified by this Certificate, Massport should circulate a hard copy of the FEIR to each State and City Agency from which the Proponent will seek permits. Massport must circulate a copy of the FEIR to all other parties that submitted individual written comments. Per 301 CMR 11.16(5), the Proponent may circulate copies of the FEIR to these other parties in CD-ROM format or by directing commenters to a project website address. However, Massport should make available a reasonable number of hard copies to accommodate those without convenient access to a computer and distribute these upon request on a first-come, first-served basis. Massport should send correspondence accompanying the CD-ROM or website address indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. A CD-ROM copy of the filing should also be provided to the MEPA Office. A copy of the EIR should be made available for review at the following Libraries: Boston Public Library – Main, Connolly, Orient Heights, Charlestown, and East Boston Branches, Chelsea Public Library, Winthrop Public Library, Revere Public Library, Everett Public Library, Milton Public Library, and Hull Public Library. C.44 C.45 C.46 C.47

Conclusion

Based on a review of the DEIR, consultation with State Agencies, and a review of comment letters, I have determined that the DEIR adequately and properly complies with MEPA and its implementing regulations. The Proponent may submit the Response to Comments and draft Section 61 Findings as the FEIR. C.48

September 16, 2016
Date

Matthew A. Beaton

Comments received:

7/28/2016	Greater Boston Convention & Visitors Bureau
8/1/2016	MassEcon
8/1/2016	Murphy, Hesse, Toomey & Lehane, LLP on behalf of the Town of Milton
8/3/2016	Local 22, Construction & General Laborers' Union
8/3/2016	Mary J. Ryan
8/3/2016	Air Impact Relief (AIR) via Aaron Toffler
8/5/2016	American Council of Engineering Compananies of Massachusetts (ACEC/MA)
8/5/2016	Associated Industries of Massachusetts (AIM)
8/10/2016	Conference of Boston Teaching Hospitals
8/11/2016	Boston Financial Services Leadership Council (BFSLC)
8/11/2016	Susanna Starrett
8/12/2016	Massachusetts Business Roundtable
8/14/2016	Magdalena Ayed
8/15/2016	Juan Ramos
8/15/2016	Linda Barber
8/15/2016	Sema Bekiroglu
8/16/2016	Town of Hull, Philip Lemnios, Town Manager
8/16/2016	Edward J. MacLean
8/16/2016	Renee MacLean
8/17/2016	Andrea White
8/17/2016	David Gardner
8/17/2016	Eugene Courier
8/17/2016	Evie Rose
8/17/2016	Herb Zeller
8/17/2016	Hull Neighbors for Quiet Skies
8/17/2016	Ira Fleishman
8/17/2016	Jen Hartnett-Bullen

8/17/2016	Joe Berkeley
8/17/2016	Juliet Floyd
8/17/2016	Karen Delano
8/17/2016	Kathy A. Beitler
8/17/2016	Linda Karoff
8/17/2016	Lisa Borden
8/17/2016	Maria Graceffa
8/17/2016	Mary Schultz
8/17/2016	Michael Doiron
8/17/2016	Michael Parks
8/17/2016	Philip R. Delano
8/17/2016	Richard Monarch
8/17/2016	Robert Stenberg
8/17/2016	Rosanne Bush
8/17/2016	Sallyann Kakas
8/17/2016	Sarah & Harold Chisholm
8/17/2016	Susan Ovans
8/17/2016	Thomas Hardey
8/17/2016	Tim Fox
8/17/2016	Val Woolley
8/18/2016	Betsy Lewenberg
8/18/2016	Jeff Kerr
8/18/2016	Karen Walsh
8/18/2016	Lloyd Emery
8/18/2016	Nancy Curtis
8/18/2016	Robyn Riddle
8/18/2016	Sheila Connor
8/18/2016	Stephen Etkind
8/18/2016	Nicole Dunn
8/18/2016	Patricia Hynes
8/18/2016	Mr. and Mrs. Tomassini
8/18/2016	Pamela Loring
8/18/2016	Canice Thynne
8/18/2016	John Brennan
8/18/2016	James & Barbara Barrow
8/18/2016	Rebecca and Tillmann Hein
8/18/2016	Stephanie B. Shafran
8/18/2016	Diane & George Nassopoulos
8/18/2016	Chris Maher
8/18/2016	Donna Goes
8/18/2016	Liz West
8/18/2016	Mary Devin
8/18/2016	Marjorie E. Wiseman
8/18/2016	Ellen

8/18/2016	Dorothy Tan
8/18/2016	Charleen Tyson
8/19/2016	Searose@comcast.net
8/19/2016	Town of Milton, Board of Selectmen
8/19/2016	Liz Kinkead
8/19/2016	Colleen MacDonald
8/19/2016	A Better City
8/19/2016	Steve West
8/19/2016	Lois Freedman
8/19/2016	Pam Sargent
8/19/2016	Paul Karoff
8/19/2016	Neill K. Ray
8/19/2016	Arlington and Belmont Representatives to the Logan CAC and Massport CAC
8/19/2016	Kathleen T. McCarthy
8/19/2016	William G. McCarthy
8/19/2016	Boston Harbor Now
8/19/2016	Andrew Schmidt
8/19/2016	Alex D. Doucette
8/19/2016	Massachusetts Department of Environmental Protection (MassDEP)
8/20/2016	Robert Banzett
8/22/2016	Association of Independent Colleges and Universities in Massachusetts (AICUM)
8/23/2016	Patricia McKinley
8/23/2016	Maria Argos Barber
8/23/2016	Joshua Acevedo
8/23/2016	Elizabeth Kay
8/25/2016	Elda Prudden
9/6/2016	Tom Carey
9/6/2016	Congressman Michael Capuano
9/7/2016	Greater Boston Chamber of Commerce
9/8/2016	Chris Marchi
9/8/2016	Steve Holt
9/8/2016	Caroline J. Mailhot
9/8/2016	Eneida Figueroa
9/8/2016	Sam Albertson
9/8/2016	Emily Hyman
9/8/2016	Peter I. Dunn
9/8/2016	Mimi L. Callum
9/8/2016	Massachusetts High Technology Council
9/8/2016	Jane O'Reilly
9/9/2016	Roy Avellaneda, Councilor at Large, Chelsea
9/9/2016	Susanna Starrett
9/9/2016	Michael, Allyson, Willa and Miles Simons
9/9/2016	Carlos Rosales
9/9/2016	Margaret Morris

9/9/2016	Kathleen McCauley
9/9/2016	Lindsay Rosenfeld
9/9/2016	John Antonellis
9/9/2016	John Casamassima
9/9/2016	Brian Gannon
9/9/2016	Celeste Ribeiro Myers
9/9/2016	Theresa Teshia Malionek
9/9/2016	Melissa Tyler
9/9/2016	Sandra Nijjar
9/9/2016	Joanne T. Pomodoro
9/9/2016	Air Impact Relief (AIR) via Aaron Toffler
9/9/2016	Alexis Pumphrey
9/9/2016	Maria Eugenia Corbo
9/9/2016	Magdalena Ayed
9/9/2016	Gail Miller
9/9/2016	Daniel Ryan
9/9/2016	Karen Sullivan
9/9/2016	John Walkey
9/9/2016	Edward, Camille & Renee MacLean
9/9/2016	Service Employees International Union (SEIU) 32BJ, District 615
9/9/2016	Alternatives for Community & Environment, Inc. (ACE)
9/9/2016	Judy Gates
9/9/2016	Mary Ellen Welch
9/9/2016	David Aiken
9/9/2016	Kannan Thiru
9/9/2016	Frederick Salvucci
9/9/2016	Neighbors United for a Better East Boston (NUBE)
9/9/2016	Angel C
9/9/2016	Rudi Seitz
9/9/2016	Alfred A. Pucillo
9/9/2016	Lydia Edwards
9/9/2016	Patricia J. D'Amore
9/9/2016	Alexis Daniels
9/9/2016	Tina Kelly
9/9/2016	Barbara McDonough
9/9/2016	Madeleine Steczynski
9/9/2016	Karen Connor
9/9/2016	Regina Marchi
9/9/2016	Roberto Verthelyi
9/9/2016	Vanessa Fazio
9/9/2016	Chrissy Holt
9/9/2016	Liz Nofziger
9/9/2016	Heather Kros
9/9/2016	June Krinsky-Rudder

9/9/2016	Kim Foltz
9/9/2016	Nancy Lee
9/9/2016	Jessica L. Curtis, JD
9/9/2016	Matthew Neave
9/9/2016	Cindy L. Christiansen
9/9/2016	Michael Passariello
9/9/2016	Elizabeth Kay
9/10/2016	Rob Pyles
9/10/2016	Jesse Borthwick
9/10/2016	Steve Passariello
9/10/2016	Carrie Van Horn
9/10/2016	John Tyler
9/10/2016	Kristen D'Avolio
9/10/2016	Craig Belaney
9/10/2016	Cindy M. López
9/10/2016	Laura Macias Grondin
9/10/2016	Sandra Downey
9/10/2016	Christopher A. Zeien
9/10/2016	Carol Doering
9/12/2016	Department of Energy Resources (DOER)
9/13/2016	Anthony M. Majahad
9/13/2016	State Senator Boncore, State Representative Madaro, and City Councilor LaMattina
9/13/2016	Mary Mitchell
9/14/2016	Olena Chuyan
9/14/2016	Julia Howington
9/16/2016	Karen Maddalena
9/16/2016	Boston Transportation Department (BTD)

MAB/PRC/prc

Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the *Terminal E Modernization Project Final Environmental Assessment/Environmental Impact Report*

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The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

Karyn E. Polito
LIEUTENANT GOVERNOR

Matthew A. Beaton
SECRETARY

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http://www.mass.gov/eea

November 10, 2016

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
FINAL ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Terminal E Modernization
PROJECT MUNICIPALITY	: East Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15434
PROJECT PROPONENT	: Massachusetts Port Authority
DATE NOTICED IN MONITOR	: October 5, 2016

As Secretary of Energy and Environmental Affairs, I hereby determine that the Final Environmental Impact Report (FEIR) submitted on this project **adequately and properly complies** with the Massachusetts Environmental Policy Act (MEPA; M.G.L. c.30, ss.61-62I) and with its implementing regulations (301 CMR 11.00). As noted in my Certificate on the Draft EIR (DEIR) issued September 16, 2016, the DEIR fully responded to the Scope contained in the Certificate on the Environmental Notification Form (ENF) and therefore the scope of the Final EIR (FEIR) was limited to a response to comments and draft Section 61 Findings.

Comments received on the FEIR continue to identify concerns regarding existing airport operations and noise levels and potential increases with long-term growth. I have received comment letters from elected officials (including U.S. Congressman Michael E. Capuano, the Milton Board of Selectmen, and Revere Mayor Brian Arrigo), state agencies, environmental advocacy groups, businesses, and residents. The issue of cumulative airport-wide impacts, particularly noise and air quality, is not new to the review of projects at Logan Airport. As noted in past Certificates, the EIR is not intended to address broad concerns associated with airport operations and growth. The venue for addressing cumulative environmental impacts is through the Environmental Status and Planning Reports (ESPR) and Environmental Data Reports (EDR). Through these reports, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment on the cumulative impacts. This regular updating and reporting on planning and cumulative impacts is unique among State Agencies. It reflects the challenge and complexity of managing and modernizing Logan Airport within a dense, urban

area. It recognizes that the proximity of communities to the Airport warrants an enhanced level of public engagement and a concerted, long-term effort to minimize and mitigate impacts.

Subsequent ESPRs and EDRs will update the cumulative impacts of passenger growth and associated ground and aircraft operations based on revised forecasts and update and revise environmental management plans to address impacts. Future submittals will continue to document potential impacts and trends and propose measures to implement the broad goal of maintaining or reducing Logan's overall environmental impacts, even as annual passenger volumes rise in the future. The next ESPR will analyze calendar year 2016 and will likely be filed in 2017 or 2018 and the next EDR will analyze calendar year 2015 and will likely be filed in the fall of 2016.

I note many comments identify a particular concern with concentrations of flight tracks due to the Federal Aviation Administration's (FAA) area navigation (RNAV) procedures. The primary purpose of the RNAV procedures is to increase safety and operational efficiency. As documented in the ESPR and annual EDR submittals, implementation of several of the RNAV procedures have generated increased noise complaints in some towns surrounding Logan Airport. The procedures themselves have resulted in aircraft at higher altitudes and concentration of flight patterns over certain communities. I note that the FAA is implementing the RNAV program nation-wide. This program is separate from and unrelated to the Terminal E Modernization project. Nonetheless, I am aware that Massport and the FAA recently signed a Memorandum of Understanding (MOU) to frame a new process for analyzing opportunities to incrementally reduce noise through changes or amendments to Performance Based Navigation, including RNAV procedures. I commend Massport and the FAA for establishing this agreement, which is a unique project between the FAA and an airport operator. Massport has indicated that this process will incorporate community outreach and public input. I expect that updates on this process will be provided in in future ESPRs and EDRs which will provide an additional forum and meaningful opportunities for public review of information related to these issues.

Over the past year, Massport has engaged in a concerted outreach effort with elected officials, municipalities, and community groups to identify and discuss potential Massport projects, including but not limited to, Terminal E. Massport created the Logan Airport Impact Advisory Group (IAG) to solicit comment and to identify and prioritize projects and programs of significance to the IAG. I commend Massport for its outreach efforts and encourage Massport to continue a productive dialogue with interested stakeholders, including through the IAG.

I have received comments that identify concerns with other potential Massport projects, including the potential parking garage identified in the DEIR, which would require an amendment to the Logan Airport Parking Freeze Regulation (310 CMR 7.30). As noted in the DEIR and previous Certificate, the potential parking garage will be subject to MEPA review pursuant to 301 CMR (6)(a)(7) because it will be constructed by a State Agency and will include construction of 1,000 or more new parking spaces. Subsequent MEPA review will include review of potential environmental impacts and development of project-specific impact avoidance, minimization, and mitigation measures.

Project Description

The project proposes modernizing Boston-Logan International Airport's John A. Volpe International Terminal (Terminal E) with a 560,000-square foot (sf) addition that corrects facility deficiencies and accommodates current and anticipated passenger volumes. The project includes three gates which previously underwent MEPA review (International Gateway Project, EEA #9791) but were not constructed, and four additional aircraft gates, passenger holdrooms, concourse, concessions, and passenger processing areas. The project includes Customs and Border Patrol (CBP) and Federal Inspection Services (FIS) facilities to replace and expand FIS facilities that were originally reviewed under MEPA (Terminal B, Pier A Improvements/Satellite FIS Facility, EEA #12235) but also not constructed. The project includes a direct pedestrian connection between Terminal E and the MBTA Blue Line Airport Station.

Terminal E was constructed in 1974 with 12 gates and served 1.4 million annual passengers. In 2014, it served approximately five million passengers. The DEIR indicated that the current level of passenger activity routinely causes severe congestion in the terminal at peak times, leading to greatly reduced customer service, and inefficient operations in the terminal and gates. According to the DEIR, gate congestion leads to airside delays and inefficiencies on the North Apron. When no gates are available, arriving aircraft and passengers are held on the apron. The DEIR indicated that aircraft must use remote parking facilities at hardstands in the North Cargo Area and passengers are bused to the terminal during peak periods when there are insufficient gates. The DEIR built upon the information presented in the ENF regarding challenges associated with current operations at Terminal E. Massport has clearly demonstrated the need for the project and made a compelling case for the expansion.

The project is proposed in two phases. Phase 1 will be constructed from 2018 – 2022 and will include construction of four new gates with associated passenger holdrooms and elevators/escalators to relieve existing deficiencies and accommodate interim growth. A partial new concourse will be constructed to allow for future expansion to a seven-gate facility at full build-out. Phase 1 will not require modifications to roadway realignment. Phase 2 will be built by 2028 and will provide three additional gates and the MBTA connection. The project will be fully constructed and operational by 2030.

The project will displace ground service equipment (GSE), other airside activities, existing surface parking, the cell phone lot, and the gas station which will be relocated within existing airport boundaries. Relocation of ground facilities that conflict with the new concourse location, including the gas station, will occur in Phase 1.

Environmental Status and Planning Report (ESPR) and Environmental Data Reports (EDRs)

The MEPA environmental review process for Logan Airport occurs on two levels: airport-wide and project-specific. The ESPR and EDR provide a "big picture" analysis of the environmental impacts of current and anticipated levels of airport-wide activities (including aircraft operations and passenger activity), and presents comprehensive strategies to avoid, minimize and mitigate impacts. The ESPR is generally updated on a five-year basis; the most recent ESPR for the year 2011 was filed in April 2013 and it contained updated passenger activity levels and aircraft operations forecasts through 2030. EDRs evaluate environmental conditions for the reporting year as compared to the previous year and are filed in the years

between ESPRs. The most recent EDR for the year 2014 was filed in October 2015. The EDR provided a comprehensive cumulative analysis of the effects of all Logan Airport activities based on actual passenger activity and aircraft operation levels in 2014 and presents environmental management plans for addressing environmental impacts. The ESPR is supplemented by (and ultimately incorporates) the EDRs and the detailed analyses and mitigation commitments that emerge from project-specific reviews. This process provides a comprehensive and continuous review of airport programs, projects, environmental impacts and associated data.

The 2015 EDR Scope includes, but is not limited to, reporting on noise, air quality, and long-term parking management. The 2015 EDR and 2016 ESPR should reflect the proposed connection to the Airport Station, provide updates on the planning and design of the connection, and identify the anticipated ridership, changes in the HOV mode share, and ground access planning considerations.

The MEPA regulations (Section 11.06(2)) indicate that during the course of an ENF review I may review any relevant information from any other source to determine whether to require an EIR, and, if so, what to require in the Scope. To provide context for this project-specific review and because many issues raised by commenters relate to airport-wide operations and impacts, this Certificate refers to documents from the ESPR process (EEA#3247/5146).

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities.

Terminal E is located adjacent to the North Cargo Area, closest to the MBTA Blue Line Airport Station. Land uses in the area of the proposed project include UPS aircraft parking and loading area, the airport's Remain Over Night aircraft parking area, the North Cargo Area equipment storage area, a building occupied by United Parcel Service (UPS), the MBTA Blue Line Airport Station, airport roadways, various short-term and cell phone parking lots, and a gas station.

The project site is located within the coastal zone of Massachusetts. The entirety of the project site is comprised of previously disturbed impervious area. It is not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The project site does not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

The ENF identified the following projects within the vicinity of Terminal E that have been reviewed under MEPA: Terminal A Replacement (EEA#9329), Terminal E Modifications (EEA#9324), Federal Inspection Services (FIS) Facility and West Concourse Project / International Gateway (EEA#9791), and Terminal B, Pier A Improvements/Satellite FIS Facility (EEA#12235).

Permitting and Jurisdiction

The project is undergoing MEPA review and required an ENF pursuant to 301 CMR 11.03(6)(b)(6) because it will be undertaken by a State Agency and results in the expansion of an existing terminal at Logan Airport by greater than 100,000 sf.

The project requires a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC) and may require an Industrial User Permit from the Massachusetts Water Resource Authority (MWRA). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review.

The project requires approval by the Federal Aviation Administration (FAA) for changes to the Airport Layout Plan and, therefore, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the U.S. Environmental Protection Agency.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Environmental Impacts and Mitigation

As described in the ENF, the project includes construction of approximately 500,000 to 700,000 sf of new floor area (for a maximum 1,500,000 sf total), and will increase both water consumption and wastewater generation by approximately 25,600 gallons per day (76,800 gpd total). The project will not create new impervious area and will eliminate approximately 60 parking spaces. The DEIR indicated that the project will accommodate existing and forecasted passenger levels and operations and, therefore, will not increase passenger enplanements or vehicle trips.

Measures to avoid, minimize and mitigate project impacts include reducing air emissions, greenhouse gas (GHG) emissions, and energy consumption compared to existing conditions by improving access to gate plug-ins, pre-conditioned air, and reducing busing operations. In addition, the building is designed to act as a noise barrier to the adjacent residential areas and Memorial Stadium Park.

Review of the FEIR

The FEIR was responsive to the scope issued in the Certificate on the DEIR. It included responses to comments filed on the DEIR and revised draft Section 61 Findings that outline Massport's mitigation commitments for the project. The FEIR included an Executive Summary of the DEIR both in English and a translated version in Spanish. The FEIR included the FAA's revised draft Finding of No Significant Impact/Draft Record of Decision (Draft FONSI/DROD) which was updated since the DEIR. This Certificate applies to the MEPA review of the project.

MEPA review cannot and does not restrict the ability of the federal government to act on those aspects of the project subject to the National Environmental Act (NEPA).

The only change to the project since the review of the DEIR is incorporation of additional mitigation measures to reduce GHG emissions (described below). No other changes to project programming, layout, or anticipated environmental impacts are identified. State Agencies did not request additional MEPA review or identify further analysis that would warrant additional MEPA review.

Response to Comments

The Response to Comments contained a copy of the DEIR Certificate and a copy of each comment letters received on the DEIR. A total of 186 comment letters were provided on the DEIR, of which 120 consisted of form letters. The FEIR contained a summary table that identified each commenter, the issues identified in their comment letter, and the corresponding section(s) of the FEIR to assist in locating the response. The FEIR contained both thematic responses to frequent comments and separate responses to individual comments. I commend Massport for providing a comprehensive response to comments and recognize the time and effort that Massport has invested in the preparation of the FEIR.

Responses to individual comments were provided for state agencies, municipalities, elected officials, and key stakeholders. Thematic responses were provided for the following categories: alternatives, cumulative impacts, environmental justice, ground transportation, health effects, induced growth, MEPA process, mitigation, noise, parking, regionalization, resiliency, RNAV departure procedures, and stakeholder outreach. Many of the comments received on the DEIR identify concerns related to existing airport operations and noise levels and potential increases in impacts associated with long-term growth. As noted in past Certificates, the EIR is not intended to address broad concerns associated with airport operations and growth. The venue for addressing cumulative environmental impacts is through the Environmental Status and Planning Reports (ESPR) and Environmental Data Reports (EDR). The Response to Comments refers to future EDRS and/or ESPRs to address these issues which are not within the Scope of this review.

As required in the Scope, the response to comments section of the FEIR provided a direct response to comments from the Department of Energy Resources (DOER) that clarified the GHG reduction measures proposed for the project and included a revised GHG analysis. Based on the revised analysis, the project incorporated two additional and significant mitigation measures: a 25,000 square feet (sf) rooftop solar photovoltaic (PV) system (300 kW) and solar thermal heating of domestic hot water for public restrooms. These two measures will reduce GHG emissions by 363 tons per year (tpy) compared to the proposed as presented in the DEIR. With these additional mitigation measures, the Preferred Alternative will reduce CO_2 emissions associated with the terminal expansion by 1,390 tpy, for a total of 3,818 tpy, or a twenty-seven percent decrease. The FEIR revised the draft Section 61 findings to reflect the revised mitigation measures.

The FEIR also evaluated and quantified the potential GHG reduction associated with the following five mitigation measures: Dual Box Minimum, Fin Tube Radiation, Energy Recovery Wheel, Dynamic V8 Filtration, and additional 50,000 sf of solar PV panels. The incorporation of these measures would reduce GHG emissions by fifty-percent. Massport has committed to continue evaluating these measures as design progresses. The FEIR also included an analysis of additional wall, roof, and fenestration improvements which indicated they are not effective GHG reduction strategies for the project. It included an evaluation of solar thermal for the concession-area hot water; however this measure remains under deliberation as concession needs are still being developed.

I acknowledge and appreciate the consultation between Massport and DOER which has resulted in the identification and commitment to additional and significant GHG emission reductions.

Mitigation/Draft Section 61 Findings

The FEIR identified measures to avoid, minimize, and mitigate environmental impacts and included draft Section 61 Findings for use by State Agencies. The FEIR clarified that the timing and responsibility for implementation of each measure. The direct connection to the Airport MBTA Blue Line Station, full sound barrier benefits associated with extending the full width of the terminal, and curb improvements will be implemented during the second phase of the project. The other energy reduction and greenhouse gas reduction measures will be implemented in the first phase of the project. Measures to avoid, minimize, and mitigate environmental impacts include:

Operational Impacts

- The Terminal E expansion has been sited and will be designed to act as a noise barrier to the adjacent East Boston neighborhoods and Memorial Stadium park to the southwest of the North Apron. The new structures will have a minimum height of 45-ft above ground level.
- New gates will have electric power and pre-conditioned air to allow aircraft to plug in at gate rather than be serviced remotely to reduce need for on-board engine/auxiliary power unit operation, thereby reducing aircraft air emissions and GHG emissions.
- New gates will increase ramp efficiency and reduce movements on North Apron and the need to bus passengers between terminal and remote aircraft parking locations, thereby reducing ground transportation related air emissions and mobile source GHG emissions.
- Roadway and curb improvements which will improve vehicle flow and high-occupancy vehicle access.
- Construction of a weather-protected pedestrian connector from the Terminal to the MBTA Airport Blue Line Station (proposed as part of Phase 2).

Sustainable Design Features/Greenhouse Gas Emissions

- Project will seek LEED Certification at the Silver level rating or better and meet or exceed the goals of the MA LEED Plus program.
- Improved building envelope (wall insulation of U-0.05, roof insulation of U-0.037, improved glazing of U-0.34, and reduced window to wall ratio of 25%).
- Improved Air Handling Units.
- Efficient water loops with reduced water supply temperature and wider return temperatures to reduce demand on the pumping and fan systems.
- Reduced interior lighting power density of 0.62 W/SF and reduced exterior lighting power of 9.3 kW.

- The roof design will incorporate materials with a minimum reflectance rating of 0.70 and emittance value of at least 0.75 for a minimum of 75% of the available roof area. Roofing materials will be non-glare to reduce heat island effect.
- Final design will incorporate infrastructure for collection, storage, and handling of recyclable materials.
- Massport will establish a project-specific goal for sourcing materials extracted, harvested, recovered, and or manufactured within New England.
- The project will be designed to achieve energy efficiencies of a minimum of 20% below the MA Energy Code.
- The project will reduce operational-related GHG emissions associated with the Project by a minimum of 30%.
- The project will include water conservation devices that reduce water use by 20% below the MA Plumbing Code.
- The project will be built 'solar ready' to accommodate rooftop solar.
- The Terminal E rooftop will include a minimum 25,000 sf of rooftop solar PV (300 kW).
- Solar thermal PV system will be used to provide hot water for the restrooms.
- Project will incorporate occupancy sensors in all indoor areas to reduce electrical demand.
- Continue to evaluate feasibility of the following measures as design progresses: Energy Recovery Wheel, additional rooftop solar PV, Dual Box Minimum, and Dynamic Filtration.
- A self-certification will be provided to the MEPA office upon completion of the project construction signed by an appropriate professional (e.g. civil engineer, traffic engineer, architect, general contractor) indicating that all of the GHG mitigation measures, or equivalent measures that are designed to collectively achieve the proposed stationary source GHG emission reduction committed to in the FEIR, have been incorporated into the project.

Air Quality

- Project will result in a decrease in carbon monoxide (CO) emissions in the area of Terminal E and the associated aircraft apron by approximately 9%, nitrogen oxide (NO_x) emissions by approximately 44%, and sulfur oxides (SO_x) emissions by approximately 33%.
- Project will result in decrease of Volatile Organic Compounds (VOCs) in the project area by approximately 6% and particulate matter (PM_{10} and $PM_{2.5}$) by approximately 9% and 25%, respectively.

Construction Period Impacts

- Development of a construction waste management plan that requires diversion or reduction of construction waste by a minimum of 75%.
- Use of high efficiency space heating/cooling systems in temporary work spaces.
- Work hours will be limited to 7:00 AM to 7:00 PM unless constrained by operational conditions at the Airport. The sound levels from construction activities will employ measures to voluntarily comply with the City of Boston's noise standards.
- Soil Management Plan will be developed based on sub-surface investigations to address identification and disposal of contaminated materials.
- Implement Indoor Air Quality (IAQ) Management Plan during construction.

- Stormwater Pollution Prevention Plan will be developed to keep sediment and contaminants out of the stormwater management system during construction.
- Soil and groundwater management during construction will be conducted in accordance with the appropriate submittals (i.e., Release Abatement Measures, Immediate Response Actions, and/or Safety Management Plans) and subsurface contamination (if encountered) will be remediated in compliance with the Massachusetts Contingency Plan.
- Measures to reduce impacts from the approximately 60 daily truck trips associated with project construction include:
  - Construction-related traffic will be required to use the North Gate using only state and federal highways and the airport roadway network to keep construction-related traffic off of local East Boston roadways.
  - Use of police detail, as necessary, to manage traffic and ensure public safety.
  - Construction companies will be required to provide off-Airport parking for their employees and to provide shuttle services or other HOV service from these locations.
- The following measures will address construction phase air quality impacts:
  - Contractor will comply with MassDEP's Clean Air Construction Initiative regarding installation of emission control devices (such as diesel oxidation catalyst and/or particulate filters) on equipment;
  - Enforcement of construction vehicle anti-idling provisions;
  - Retrofitting diesel construction equipment with diesel oxidation catalysts and/or particulate filters;
  - Fugitive dust will be controlled via wetting or sweeping and all trucks hauling materials from the construction site will be covered.

Conclusion

Based on a review of the FEIR, comment letters, and consultation with State Agencies, I find that the FEIR adequately and properly complies with MEPA and its implementing regulations. Future EDRs and ESPR submittals will continue to document potential impacts and trends and propose measures to implement the broad goal of maintaining or reducing Logan's overall environmental impacts, even as annual passenger volumes rise in the future. Massport and State Agencies should forward copies of the final Section 61 Findings to the MEPA Office for publication in accordance with 301 CMR 11.12.

November 10, 2016
Date

Matthew A. Beaton

Comments received:

10/08/16	David Waite
10/10/16	Sarah James
10/10/16	Peter Houk
10/15/16	Marjorie Smith
10/18/16	Lahra Tillman

10/18/16	Maureen Wing
10/18/16	Reena Freedman
10/18/16	John Vitagliano
10/21/16	David Bowen
10/21/16	Ken Bader
10/23/16	Estella and David Keefer
10/24/16	Carolann Barrett
10/25/16	Shelia Mooney
10/27/16	Luke Preisner
10/28/16	Frederick Salvucci
10/28/16	Mary Ryan
10/31/16	Amelia Kantrovitz
10/31/16	Caslynn Carambelas and Vaishal Patel
10/31/16	Elizabeth Gazda
10/31/16	Juan Carlos Garzon
10/31/16	Stephen Raymond
10/31/16	Scott Johnson
10/31/16	Julie Vail
11/01/16	Sema Bekiroglu
11/01/16	Catherine Stacy
11/01/16	Cady Landa
11/01/16	Dominica Bonanno
11/01/16	Congressman Michael Capuano
11/01/16	Hull Neighbors for Quiet Skies
11/02/16	Tonya Saccardo
11/02/16	Robert Saccardo
11/02/16	Milton Board of Selectmen
11/02/16	Matthew Stachler, M.D., Ph.D.
11/03/16	Barbara L Lawrence
11/03/16	Magdalena Ayed
11/03/16	City of Lynn, Bill Bochnak, Massport CAC & Logan Airport Member
11/03/16	G. Bernadette Cantalupo, 156 Porter St.
11/03/16	William Schneiderman
11/04/16	Gail Miller
11/04/16	Massachusetts Department of Environmental Protection (MassDEP)
11/04/16	Chris Marchi
11/04/16	James Linthwaite
11/04/16	Catherine Stalberg
11/04/16	Mary Ellen Welch (1 of 2)
11/04/16	Mary Ellen Welch (2 of 2)
11/04/16	Department of Energy Resources (DOER)
11/04/16	Vickie Livermore
11/04/16	City of Revere, Mayor Arrigo
11/04/16	AIR Inc., Aaron Toffler
11/04/16	Deborah Hartman
11/04/16	Mimi Callum
11/04/16	Andrea Vilanova
11/04/16	Ann Jansen
11/04/16	John Casamassima
11/04/16	Alyssa Vangeli
11/04/16	Tara Ten Eyck
11/04/16	Boston Harbor Now

11/07/16 28 Form Letters from Residents of the Porter156 Condominium Association
11/07/16 Jesse Borthwick

MAB/PRC/prc

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Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the *Logan Airport Parking Project Environmental Notification Form*

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The Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

Charles D. Baker
GOVERNOR

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May 5, 2017

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
ENVIRONMENTAL NOTIFICATION FORM

PROJECT NAME	: Logan Airport Parking Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15665
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: April 5, 2017

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G. L. c. 30, ss. 61-62I) and Section 11.03 of the MEPA regulations (301 CMR 11.00), I have reviewed the Environmental Notification Form (ENF) and hereby determine that this project **requires** the preparation of a Mandatory Environmental Impact Report (EIR).

Project Description

As described in the ENF, the project includes the construction of 5,000 additional commercial parking spaces at the Logan International Airport (the "Airport"). The parking spaces will be located on additional floors within the existing Economy Garage and at a new parking garage in the location of the existing Terminal E surface parking lot. Potential phasing of the project and design of the parking structures is being developed; however, the ENF indicates that all 5,000 additional commercial parking spaces will be operational between 2022 and 2024. The ENF indicates that the parking spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport. According to the ENF, the project will reduce

drop-off/pick-up activity at the Airport and will reduce regional air passenger-related vehicle miles traveled (VMT) and associated air emissions.

In addition to the overall air quality benefits, the ENF indicates that Massport is considering additional high occupancy vehicle (HOV) mode improvement measures in conjunction with this project. These include enhancing Logan Express bus service through expanded parking at existing locations and increased frequency of service and expanding the Logan Express service area to new suburban locations and urban/downtown areas based on the success of the Back Bay Logan Express pilot program. The ENF also indicates that Massport is considering purchasing additional Silver Line buses to increase service capacity to the Airport.

Project Background and Context

The number of commercial and employee parking spaces allowed at Logan Airport is regulated by the Massachusetts Department of Environmental Protection (MassDEP) through the Massport/Logan Airport Parking Freeze (310 CMR 7.30), an element of the Massachusetts State Implementation Plan (SIP) under the federal Clean Air Act. The ENF indicates that peak day demand for on-Airport parking has been increasing, resulting in daily demand frequently nearing the Logan Airport Parking Freeze cap. Massport has filed this ENF concurrent with MassDEP's issuance of a draft regulation to amend the Parking Freeze. At Massport's request, the amendment would allow the creation of an additional 5,000 commercial parking spaces at the Airport. The MassDEP public comment period on the proposed regulations will close on May 8th, after this Certificate is issued.

As currently drafted, the regulations would increase the Logan Airport commercial parking freeze limit by 5,000 spaces (from 18,640 to 23,640 spaces) and would increase the total cap to 26,088 commercial and employee parking spaces (comprised of 23,640 commercial spaces and 2,448 employee parking spaces). The draft regulations include a requirement that Massport complete the following studies, each within 24 months of when the final regulations are promulgated, to identify ways to further support alternative transit options to the airport:

1. A study to evaluate the costs, feasibility, and effectiveness of potential measures to improve HOV access to the Airport. The study would consider, among other things, possible improvements to Logan Express bus service and the benefits of adding Silver Line buses with service to the Airport.
2. A study of costs and pricing for different modes of transportation to and from the Airport to identify a pricing structure and the use of revenues so generated to promote the use of HOV modes of transportation by Airport air travelers and visitors. The study will include evaluation of short-term and long-term parking rates and their influence on different modes of Airport transportation.
3. A study of the feasibility and effectiveness of potential operational measures to reduce non-high occupancy vehicle pick-up / drop-off modes of transportation to Logan Airport, including an evaluation of emerging ride-sharing and transportation network company modes.

This Project is contingent upon MassDEP amending the Logan Airport Parking Freeze regulation and EPA approval of an amendment to the SIP. If the regulations are not amended, the

Logan Airport Parking Project cannot proceed. The MassDEP regulatory amendment would provide the larger framework of the Logan Airport Parking Freeze, while project-specific impacts and mitigation measures will be analyzed through the MEPA review process for the Logan Airport Parking Project.

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The preferred locations for the parking structures are the Economy Garage and the Terminal E surface parking lot. The Economy Garage is located in the northwest portion of the Airport campus at the intersection of Service Road and Prescott Street. It is comprised of two levels and provides over 2,700 spaces. The Terminal E surface parking lot is located within the Airport interior and adjacent to Terminal E.

As described in the ENF, the airport is well-served by public transportation and approximately 30% of travelers accessing the Airport arrive via HOV modes. Specifically, the Airport is served by several Massachusetts Bay Transportation Authority (MBTA) public transit routes, including Blue and Silver Lines for the rapid transit system, commuter ferry service, and local and express bus routes. Specifically, Massport provides free shuttle service between the Blue Line Airport Station and all Airport terminals and subsidizes the Silver Line Logan Airport Route (SL1) by providing free outbound Silver Line trips from the Airport on eight Silver Line buses purchased for this route by Massport. Massport also operates an extensive Logan Express Bus service, serving five locations. The airport is also served by other private express bus service and intercity bus service as part of the range of HOV modes available for ground access.

The Economy Garage and the Terminal E parking lot sites are both located within the coastal zone of Massachusetts. Both locations are comprised of previously disturbed impervious area. They are not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The parking lot sites do not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

Environmental Impacts and Mitigation

The project includes construction of 5,000 new commercial parking spaces at two locations. The project is located within previously altered impervious area and will not create new impervious area. According to the ENF, the new spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport while minimizing pick-up and drop-off activity and decreasing regional air passenger-related VMT and associated vehicle emissions. Specifically, the ENF indicates that the project will reduce carbon dioxide (CO_2), volatile organic compounds (VOC), and oxides of nitrogen (NO_x) emissions by

approximately 25% in 2022 and approximately 20% in 2030 as compared to the future No-Build Alternative.

The ENF indicates that expanded overall HOV capacity will be necessary to maintain the current HOV mode share as total passenger trips increase. In addition to the overall project benefits and HOV related measures proposed as part of the amendment to the Logan Parking Freeze, the ENF indicates that Massport is considering undertaking additional HOV measures in conjunction with the construction of the proposed 5,000 parking spaces. These include: enhancing existing Logan Express scheduled bus service; expanding Logan Express scheduled bus service; exploring Logan Express scheduled bus service in the urban/downtown area; and investing in additional MBTA Silver Line buses. In addition, the parking garages may be designed to be certified in the new "Parksmart" program, which applies Leadership in Energy and Environmental Design (LEED) sustainability strategies to structured parking facilities. The ENF indicates that measures to avoid, minimize, and mitigate project impacts will be further defined in the DEIR.

Jurisdiction and Permitting

The project is undergoing MEPA review and requires preparation of a mandatory EIR pursuant to 301 CMR 11.03(6)(a)(7) because it will be undertaken by a State Agency and will construct greater than 1,000 parking spaces in a single location.

The project may require a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review. As indicated above, this project is contingent upon MassDEP amending the Logan Airport Parking Freeze to allow the creation of an additional 5,000 commercial parking spaces at the Airport. Should the draft regulations which propose amending the freeze be promulgated as final, MassDEP will submit the final amended Parking Freeze regulations to the U.S. Environmental Protection Agency (EPA) for approval and incorporation into the SIP.

The project may require approval by the Federal Aviation Administration (FAA), which would trigger review under the National Environmental Policy Act (NEPA).[1] The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the EPA.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

[1] The ENF indicates that the level of NEPA review, if required, will depend on the chosen alternative and will be at the discretion of the FAA.

Review of the ENF

The ENF includes a general description of proposed activities, a conceptual discussion of proposed conditions, a brief analysis of alternative locations, and an executive summary of the project in English and in Spanish. The ENF provides a suggested scope for the DEIR that identifies further analysis and data that will be provided to assess potential impacts and measures to avoid, minimize, and mitigate these impacts. The ENF does not provide project plans nor a description of the parking structures and notes that design of the structures is pending MassDEP amending the Parking Freeze. I expect that the DEIR will be a comprehensive and thorough filing that includes project plans for the Preferred Alternative and demonstrates that impacts have been avoided, minimized, and mitigated to the maximum extent feasible. C.1

Comments

MassDEP comments indicate that the draft Parking Freeze Amendment is under review and public comment is ongoing. Their comments identify design recommendations for the parking structures (including installation of electric vehicle (EV) charging stations and designation of preferred parking spaces for alternative fuel vehicles) request Massport implement measures to increase HOV and transit travel modes to the airport, including those identified by Massport in the ENF and providing incentives to increase HOV use.

Comments from industry and labor groups support the project and identify the economic support that the Airport provides to the region, including jobs, tax revenue, and financing for business growth. Other comments emphasize the importance of Massport implementing additional measures to reduce reliance on single occupancy vehicles (SOV), including those identified by Massport in the ENF. In addition, comments request Massport consider: implementing a toll for vehicles entering or exiting the airport to be used for HOV improvement measures, improving silver line (SL1) service (in addition to adding new vehicles), and improving the shuttle connection between the Blue Line and the terminals. The Scope for the DEIR requires additional information regarding project mitigation measures and methods to sustain and increase HOV mode share. C.2

Alternatives Analysis

The ENF indicates that the planning process considered six alternative on-airport locations for the structured parking facilities. All of the sites are paved and developed areas that are currently used for parking or vehicle storage. The ENF indicates that each of the sites are comparable in terms of regional VMT and emissions reductions since regional access routes will not vary as a result of the garage siting.

- Harborside Drive – Structured parking in location of existing vehicle layover space
- Porter Street – Structured parking over existing taxi pool
- North Cargo Area – Expand Economy Garage in the location of existing surface parking and the Massachusetts State Police building
- Southwest Service Area – Structured parking in location of current bus/limousine pool and overflow parking

- Economy Garage (Preferred Alternative) – Additional spaces above existing garage
- Terminal E Surface Lot (Preferred Alternative) – Structured parking in location of existing surface parking lot

According to the ENF, the Preferred Alternative was selected based on input from the East Boston Logan Impact Advisory Group (LIAG). The ENF indicates that Harborside Drive and Porter Street sites were eliminated due to potential wayfinding and operational challenges and the North Cargo Area was eliminated due to the need to relocate the existing uses. The Southwest Service Area was eliminated as it would require construction of a new parking structure and integration of existing uses into the ground floor. The ENF indicates that the No-Build alternative was eliminated as it would result in higher pollutant emissions and roadway congestion due to the higher VMT associated with the drop-off/pick-up mode. The ENF identifies the Economy Garage and Terminal E Surface Lots as the Preferred Alternative. The ENF indicates the Economy Garage location was selected as the Preferred Alternative because the site access is well defined, it does not require significant changes to existing roadway infrastructure, and it is adjacent to compatible land uses and the Terminal E Surface Lot location was selected due to its proximity to Airport terminals, compatibility with adjacent land uses, and location within the Airport interior to minimize impacts to adjacent communities.

Air Quality

The project is anticipated to shift mode share from drop-off/pick-up modes and result in reductions in regional off-Airport VMT compared to the future No-Build scenario. The project will result in CO_2, VOC, and NO_x reductions of 25.8%, 25.5% and 25.6% (respectively) in 2022 and 20.2%, 20.0%, and 20.2% (respectively) in 2030 as compared to the future No-Build scenario.

The analysis assumes that HOV modes can accommodate the proportional growth in passenger levels. The ENF indicates that Massport will continue to strive to maintain the current HOV mode share levels, and expand overall HOV capacity as total passenger trips increase.

The ENF indicates that an updated air quality analysis will be provided in the DEIR.

GHG Emissions and Sustainability

The project is subject to review under the May 5, 2010 MEPA Greenhouse Gas Emissions Policy and Protocol ("the Policy"). The ENF indicates that Massport will quantify stationary and mobile source emissions (passenger vehicles) generated by the project. Massport has indicated that stationary source emissions will only be evaluated if the garage contains conditioned spaces. I refer Massport to DOER's comment letter which identifies a limited number of GHG measures that should be evaluated regardless of whether the garages include conditioned space.

The ENF identified Massport's efforts to maintain and increase HOV modes, including strategies related to pricing (incentives and disincentives), service availability, service quality, marketing, and traveler information. The ENF indicates that the parking garages may be designed to be certified in the new "Parksmart" program, which applies LEED sustainability strategies to structured parking facilities.

Noise

The ENF indicates that ground noise impacts will not change significantly as the project will not require proposed relocation of or changes to existing land use. The ENF indicates that the proposed vertical addition to the Economy Garage may act as an additional noise barrier to the adjacent neighborhood.

Construction Period Impacts

The ENF indicates that construction period impacts and associated mitigation measures, including noise, air quality, traffic, solid and hazardous waste, and water quality will be evaluated in the DEIR. It will also describe project phasing and sequencing. Massport participates in MassDEP's Clean Construction Equipment Initiative and requires engine retrofits to reduce exposure to diesel exhaust fumes and particulate emissions. The ENF indicates that construction activities will comply with MassDEP Solid Waste and Air Quality control regulations.

SCOPE

General

The ENF included a proposed scope for the DEIR. It includes an executive summary, project description, alternatives analysis, planning and sustainable design, traffic and multi-modal transportation, air quality and GHG, and construction impacts. In addition to the Scope items proposed in the ENF, the Scope for the DEIR should be supplemented by the additions and modifications identified below.

Project Description and Permitting

C.3 The DEIR should include site plans for existing and post-development conditions at a legible scale including the proposed garage structures and any curbside improvements and changes to the on-airport roadways. C.4 The DEIR should provide additional information to address construction sequencing and phasing. C.5 The DEIR should address traffic volumes and crash rates at the Airport. It should include a description of existing and proposed conditions, including on and off-Airport access, on-Airport circulation, and parking. C.6 The project description should address pedestrian and transit connections between the garages and the airport; pedestrian, transit, and vehicular access and egress locations; access and revenue control systems; anticipated rate structures; and identify hybrid, alternative fuel, and EV parking locations. C.7 As requested by MassDEP, it should include an evaluation of incorporating EV charging stations into the parking garages and identify the number and location of proposed stations. It should

include a discussion of how the construction and design of the garage could facilitate future expansion of EV charging stations if warranted by demand. C.7 Cont.

C.8 As indicated above, the draft amended Parking Freeze regulations would require Massport to complete three studies to identify ways to further support alternative transit options to the Airport. The results of these studies can be used to inform and benefit the development of mitigation measures for the Logan Airport Parking Project. The DEIR should clarify the timeframe for completed studies relative to the timeframe for developing specific mitigation measures for the Logan Airport Parking Project which are identified in the ENF. It should identify any commitments that would be contingent on the completion of a study.

C.9 The DEIR should address ground access considerations associated with the parking structures. It should describe site and design constraints for both locations. C.10 It should identify how the Terminal E garage will be designed consistent with the curbside improvements and changes to on-airport runways associated with the Terminal E Modernization Project which will commence construction in 2018. C.11 The DEIR should identify and describe any changes to the project since the filing of the ENF and provide an update on permitting. It should include a discussion of permitting requirements and document the project's consistency with regulatory standards, as appropriate.

Alternatives Analysis

C.12 The DEIR should expand on the initial alternatives analysis and summarize the findings of and the input provided by the community process that guided site selection. The DEIR should identify the number of parking spaces that could be accommodated at each of the alternative locations and describe in more detail why the Southwest Service Area location was eliminated from consideration. C.13 The DEIR should evaluate potential construction phasing and configurations. C.14 It should compare and contrast benefits and potential impacts of alternatives in narrative form and in a tabular format. C.15 The ENF indicates that the project will provide sufficient parking to accommodate approximately five years of peak-day parking demand if growth trends continue at current rates. The DEIR should identify the planning metrics and analysis used to determine the final number of proposed parking spaces (5,000 spaces).

Air Quality

As indicated above, the project is anticipated to shift mode share from drop-off/pick-up modes and result in reductions in regional off-Airport VMT compared to the future No-Build scenario. The project will result in CO_2, VOC, and NO_x reductions of 25.8%, 25.5% and 25.6% (respectively) in 2022 and 20.2%, 20.0%, and 20.2% (respectively) in 2030 as compared to the future No-Build scenario. As noted in the ENF, although there has been a long-term trend of decreasing emissions since 1990, airport-wide emissions of VOCs and NO_x are predicted to increase slightly from 2010 to 2030. The ENF indicates that a portion of this increase may be attributed to anticipated increases in air passenger activity levels and associated rise in regional and on-Airport VMT.

The air quality analysis provided in the ENF is predicated on maintaining an
approximately 30% HOV mode share and proportional growth in demand for HOV. The DEIR
should demonstrate that the HOV programs and any proposed HOV improvement measures will C.16
provide the capacity to meet demand associated with growth. Massport has made significant
investments in programs to maintain and increase HOV modes and has been recognized as one
of the top-ranking airports in terms of HOV/transit mode share. I note the 2015 Environmental
Data Report (EDR) indicated that Massport's current ground access goal is to attain a 35.2%
HOV mode share when annual air passenger levels reach 37.5 million. The ENF indicates that
passenger levels are approaching this level with over 36 million passengers in 2016. To support
Massport's investments and extend their benefits, the DEIR should include an evaluation of
measures to support HOV use and extend the associated air quality benefits of the program and
identify to what extent these measures will contribute towards attaining the future mode share
goal.

These additional measures include: increasing the frequency of transit services, C.17
expansion of transit services, parking supply, and pricing; and implementation of tolls or charges
that can be used to improve HOV measures. I note improvements to reduce idling time of HOV
modes (i.e. Logan Express, Blue Line Airport Shuttle, and SL1 Silver Line) will also provide air
quality benefits. I refer Massport to comment letters which recommend additional measures to
improve HOV and reduce VMT. I note monitoring and reporting on the progress towards
achieving the goals and success of the mitigation program can be addressed in the Long-Term
Parking Management Plan and future Environmental Status and Planning Reports (ESPRs) and C.18
Environmental Data Reports (EDRs) (EEA#3247/5146).

The DEIR should identify and analyze localized on-Airport, community ground access,
and air quality conditions at each of the proposed locations. The updated air quality analysis for
existing and future year conditions should evaluate the changes in transportation and air quality C.19
emissions. The air quality analysis provided in the ENF should be revised to reflect the proposed
construction phasing and timeframe to identify when the air quality benefits associated with
reduced VMT will be realized.

GHG Emissions and Sustainability

The DEIR should include an analysis of GHG emissions and mitigation measures in
accordance with the standard requirements of the MEPA GHG Policy and Protocol. The analysis C.20
should include project-related stationary source emissions (exterior/interior parking structure
lighting, ventilation, etc.) and mobile source emissions (passenger vehicles). The DEIR should
present an evaluation of mitigation measures as outlined in the comments from the Department C.21
of Energy Resources (DOER) as appropriate based on whether the parking structures will
contain conditioned spaces. I note that DOER's comments also identify mitigation measures that
should be explored absent conditioned space, including but not limited to reduced lighting power
densities (LPD) for interior and exterior lighting, parking structure ventilation, and solar
photovoltaic (PV) installations. At a minimum, I expect the DEIR will present an evaluation of C.22
the feasibility and impact of these measures. This evaluation can be performed as separate
calculations in lieu of energy modeling.

The DEIR should include an evaluation of rooftop or carport solar PV. It should include a
cost analysis to determine the financial feasibility of solar (including potential payback periods)
and propose an installation that can be supported by the maximum available roof area (excluding
areas dedicated for mechanical equipment) on both parking structures. The DEIR should include C.23
the assumed panel efficiency, estimate the electrical output of the system, and estimate annual
GHG reductions due to the use of renewable energy instead of electricity or natural gas. The
analysis should include a narrative and data to support the Proponent's adoption (or dismissal) of
solar PV systems.

The GHG analysis should include an evaluation of the potential GHG emissions of the
project's mobile emissions sources using the EPA MOVES emissions model. The DEIR should
use data gathered as part of the air quality analysis to determine mobile emissions for Existing
Conditions, and the future No-Build, Build, and Build with Mitigation Conditions. The Build C.24
with Mitigation Conditions should incorporate measures and associated reductions identified in
the Air Quality section above that will support HOV use and extend the associated air quality
benefits of the program.

The DEIR should provide emission tables that compare base case emissions in tons per
year (tpy) with the Preferred Alternative showing the anticipated reduction in tpy and percentage C.25
by emissions source (direct, indirect and transportation). If the garages include conditioned
space, information should be provided for each building in a format similar to the example table C.26
provided in DOER's comment letter.

The project is in the conceptual design stage and, as such, provides meaningful
opportunities for incorporation of sustainability measures. The DEIR should describe the
project's consistency with Massport's Floodproofing Design Guide to demonstrate that the
project will incorporate measures into the structure and site design to address potential impacts C.27
related to predicted sea level rise.

Noise

The ENF indicates that constructing additional levels on the Economy Garage can serve
as an additional noise barrier to the adjacent neighborhood. The DEIR should identify how the
sound barrier benefits of the taller garage have been maximized through its design. This C.28
evaluation should account for the expanded Terminal E building.

Construction Period Impacts

The DEIR should identify construction period impacts, including noise, air quality, C.29
traffic, solid and hazardous waste, and water quality, and identify avoidance, minimization, and
mitigation measures. The DEIR should describe the project phasing and sequencing and address C.30
how construction will occur to avoid impacting the existing constrained parking supply. It should
address construction phasing and whether construction will occur simultaneously with the C.31
Terminal E project.

Mitigation and Draft Section 61 Findings

The DEIR should include a separate chapter summarizing proposed mitigation measures.
This chapter should also include draft Section 61 Findings for each area of impact associated C.32
with Massport's Preferred Alternative. The DEIR should contain clear commitments to
implement these mitigation measures, estimate the individual costs of each proposed measure, C.33
identify the parties responsible for implementation (either funding design and construction or
performing actual construction), and a schedule for implementation. To ensure that all GHG
emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually
constructed or performed by the Proponent, I require Proponents to provide a self-certification to C.34
the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have
been completed. The commitment to provide this self-certification in the manner outlined above
should be incorporated into the draft Section 61 Findings included in the DEIR.

Response to Comments

The DEIR should contain a copy of this Certificate and a copy of each comment letter C.35
received on the ENF. In order to ensure that the issues raised by commenters are addressed, the
DEIR should include direct responses to these comments to the extent that they are within
MEPA jurisdiction. This directive is not intended, and shall not be construed, to enlarge the C.36
scope of the EIR beyond what has been expressly identified in this Certificate. The response can
refer to future EDRs and/or ESPRs to address issues that are not within the DEIR Scope. I
recommend that Massport employ an indexed response to comments format, supplemented as C.37
appropriate with direct narrative response.

Circulation

In accordance with Section 11.16 of the MEPA Regulations and as modified by this
Certificate, Massport should circulate a hard copy of the DEIR to each State and City Agency C.38
from which the Proponent will seek permits. Massport must circulate a copy of the DEIR to all
other parties that submitted individual written comments. Per 301 CMR 11.16(5), the Proponent C.39
may circulate copies of the DEIR to these other parties in CD-ROM format or by directing
commenters to a project website address. However, Massport should make available a reasonable
number of hard copies to accommodate those without convenient access to a computer and
distribute these upon request on a first-come, first-served basis. Massport should send C.40
correspondence accompanying the CD-ROM or website address indicating that hard copies are
available upon request, noting relevant comment deadlines, and appropriate addresses for
submission of comments. A CD-ROM copy of the filing should also be provided to the MEPA
Office. A copy of the EIR should be made available for review at the following Libraries: Boston C.41
Public Library – Main, Orient Heights, and East Boson Branches, Chelsea Public Library, C.42
Winthrop Public Library, and Revere Public Library.

May 5, 2017
Date

Matthew A. Beaton

Comments received:

4/13/2017	Matthew Barison
4/14/2017	Massachusetts Competitive Partnership (MACP)
4/21/2017	Associated Industries of MA (AIM)
4/18/2017	South Shore Chamber of Commerce
4/21/2017	Association of Independent Colleges and Universities in Massachusetts (AICUM)
4/24/2017	Bill Schmidt, Vice Chairman, Winthrop Board of Health
4/21/2017	Boston Water and Sewer Commission (BWSC)
4/20/2017	Local 22 Construction & General Laborers' Union
4/25/2017	Patricia J. D'Amore
4/25/2017	John Vitagliano
4/25/2017	Frederick Salvucci
4/25/2017	Metropolitan Area Planning Council (MAPC)
4/25/2017	Massachusetts High Technology Council (MAHT)
4/25/2017	Wig Zamore (1 of 4)
4/25/2017	Wig Zamore (2 of 4)
4/25/2017	Wig Zamore (3 of 4)
4/25/2017	Wig Zamore (4 of 4)
4/27/2017	Boston Financial Services Leadership Council
4/27/2017	Department of Energy Resources (DOER)
5/5/2017	Massachusetts Department of Environmental Protection (MassDEP)

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Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the *Logan Airport Parking Project Draft Environmental Impact Report*

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The Commonwealth of Massachusetts
Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
Boston, MA 02114

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August 2, 2019

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Logan Airport Parking Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15665
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: June 10, 2019

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62I) and Section 11.08 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Draft Environmental Impact Report (DEIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations. The Massachusetts Port Authority (Massport) must prepare and submit for review a Final Environmental Impact Report (FEIR) in accordance with the Scope provided in this Certificate. The Scope is intended to ensure consistency with other planning documents and ongoing studies and is primarily limited to air quality, greenhouse gas emissions, construction period impacts, responses to comments, and revisions to mitigation measures and draft Section 61 Findings.

As described below, the amended Parking Freeze regulations require Massport to complete three studies to identify ways to further support alternative transit options to and from the Airport. The results of these studies will inform Massport's long-range planning efforts to reduce air passenger-related vehicle miles traveled (VMT) and associated air emissions which will extend the associated air quality benefits of this project. I encourage Massport to amend the 2017 Environmental Status and Planning Report (ESPR), submitted to the MEPA office for

publication in the August 7, 2019 *Environmental Monitor*, to include the completed studies and a summary of their findings. It should also describe how the results have informed Massport's long-range efforts to address VMT and air quality impacts of different ground access modes to/from the Airport and identify recommendations or findings that Massport has already implemented. The completed studies and information identified above should also be provided in the FEIR to support review of these measures.

Project Description

As described in the DEIR, the project includes the phased construction of 5,000 additional commercial parking spaces at the Logan International Airport (the "Airport"). The project will construct a structured parking garage with 2,000 parking spaces in the location of the existing Terminal E surface parking lot followed by the addition of 3,000 new spaces at the Economy Garage through expansion of the existing facility. The Terminal E Garage will open in 2022 and the Economy Garage expansion will open by the end of 2025. The parking spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport. According to the DEIR, the project will reduce drop-off/pick-up activity at the Airport and will reduce regional air passenger-related vehicle miles traveled (VMT) and associated air emissions.

In addition to the overall air quality benefits, the DEIR indicated that Massport is implementing additional high occupancy vehicle (HOV) mode improvement measures in conjunction with this project. These include enhancing Logan Express bus service through expanded parking at existing locations and increased frequency of service and expanding the Logan Express service area to new suburban locations and urban/downtown areas based on the success of the Back Bay Logan Express pilot program. The DEIR also indicated that Massport has committed to purchase additional Silver Line buses to increase service capacity to the Airport. As described in the DEIR, Massport is also planning to centralize transportation network company (TNC) (e.g. Uber, Lyft, etc.) operations (i.e. drop-offs and pick-ups) on the ground floor of the Central Garage complex to reduce congestion outside the terminals. Massport is also evaluating mechanism to decrease the number of TNC drivers that leave the Airport without a passenger (i.e., deadhead trips).

Project Background and Context

The number of commercial and employee parking spaces allowed at Logan Airport is regulated by the Massachusetts Department of Environmental Protection (MassDEP) through the Massport/Logan Airport Parking Freeze (310 CMR 7.30), an element of the Massachusetts State Implementation Plan (SIP) under the federal Clean Air Act. As previously described in the Environmental Notification Form (ENF), peak day demand for on-Airport parking was increasing, resulting in daily demand frequently nearing the Logan Airport Parking Freeze cap. Massport worked with MassDEP on an amendment to the Parking Freeze. The ENF was filed concurrent with MassDEP's issuance of a draft regulation to amend the Parking Freeze to allow the creation of an additional 5,000 commercial parking spaces at the Airport. After the Certificate on the ENF was issued, MassDEP approved the requested parking increase and issued the amended regulation on June 30, 2017. The EPA issued a proposed rule approving the revision of the SIP and incorporating the amended Parking Freeze on March 6, 2018, and the rule went into effect on April 5, 2018. The MassDEP regulations provide the larger framework of the Logan Airport Parking Freeze, while project-specific impacts and mitigation measures will be analyzed through the MEPA review process for the Logan Airport Parking Project.

The approved regulations increased the Logan Airport commercial parking freeze limit by 5,000 spaces (from 18,640 to 23,640 spaces) and increased the total cap to 26,088 commercial and employee parking spaces (comprised of 23,640 commercial spaces and 2,448 employee parking spaces). The regulations (310 CMR 7.30(8)) require that Massport complete the following studies, each within 24 months of June 30, 2017, to identify ways to further support alternative transit options to the airport:

1. A study to evaluate the costs, feasibility, and effectiveness of potential measures to improve HOV access to the Airport. The study should consider, among other things, possible improvements to Logan Express bus service and the benefits of adding Silver Line buses with service to the Airport.
2. A study of costs and pricing for different modes of transportation to and from the Airport to identify a pricing structure and the use of revenues so generated to promote the use of HOV modes of transportation by Airport air travelers and visitors. The study will include evaluation of short-term and long-term parking rates and their influence on different modes of Airport transportation.
3. A study of the feasibility and effectiveness of potential operational measures to reduce non-high occupancy vehicle pick-up/drop-off modes of transportation to Logan Airport, including an evaluation of emerging ride-sharing and transportation network company modes.

Supplemental information from Massport clarified that the three studies will be completed by September 30, 2019.

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The preferred locations for the parking structures are the Economy Garage and the Terminal E surface parking lot. The Economy Garage is located in the northwest portion of the Airport campus at the intersection of Service Road and Prescott Street. It is comprised of two levels and provides over 2,700 spaces. The Economy Garage has an existing rooftop solar photovoltaic (PV) system on its top level which will be relocated or replaced on the top level of the garage following construction. The Terminal E surface parking lot is located within the Airport interior and adjacent to Terminal E.

The Airport is served by several Massachusetts Bay Transportation Authority (MBTA) public transit routes, including Blue and Silver Lines for the rapid transit system, commuter ferry

service, and local and express bus routes. Specifically, Massport provides free shuttle service between the Blue Line Airport Station and all Airport terminals and subsidizes the Silver Line Logan Airport Route (SL1) by providing free outbound Silver Line trips from the Airport on eight Silver Line buses purchased for this route by Massport. Massport also operates an extensive Logan Express Bus service, serving five locations. The airport is also served by other private express bus service and intercity bus service as part of the range of HOV modes available for ground access.

The Economy Garage and the Terminal E parking lot sites are both located within the coastal zone of Massachusetts. Both locations are comprised of previously disturbed impervious area. They are not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The parking lot sites do not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

Environmental Impacts and Mitigation

The project includes construction of 5,000 new commercial parking spaces at two locations. The project is located within previously altered impervious area and will not create new impervious area. According to the DEIR, the new spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport while minimizing pick-up and drop-off activity and decreasing regional air passenger-related VMT and associated vehicle emissions. Specifically, the DEIR indicates that the project will reduce carbon dioxide (CO_2), volatile organic compounds (VOC), and oxides of nitrogen (NO_x) emissions by 10%, 11%, and 11% in 2022 when the first 2,000 parking spaces are constructed and 12%, 12% and 11% in 2030 when all 5,000 spaces are constructed (respectively) as compared to the future No-Build Alternative.

In addition to the overall project benefits and HOV related measures required as part of the Logan Parking Freeze, the DEIR indicated that Massport is undertaking additional HOV measures in conjunction with the construction of the proposed 5,000 parking spaces. These include: enhancing existing Logan Express scheduled bus service; expanding Logan Express scheduled bus service; exploring Logan Express scheduled bus service in the urban/downtown area; and investing in additional MBTA Silver Line buses. Massport will also centralize TNC operations to reduce on-Airport congestion and evaluate mechanisms to decrease TNC deadhead trips.

Jurisdiction and Permitting

The project is undergoing MEPA review and requires preparation of a mandatory EIR pursuant to 301 CMR 11.03(6)(a)(7) because it will be undertaken by a State Agency and will construct greater than 1,000 parking spaces in a single location. The project may require a modified Sewer Use Discharge Permit from the Massachusetts Water Resources Authority (MWRA).[1]

[1] This potential Permit was not identified in the ENF.

The project may require a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review. The project requires approval by the Federal Aviation Administration (FAA) for changes to the Airport Layout Plan and, therefore, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the EPA.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

<u>Review of the DEIR</u>

Massport filed a joint DEIR/EA to satisfy the MEPA and NEPA review processes. This Certificate applies to the review of the project under MEPA only, and does not restrict the ability of the federal government to act on those aspects of the project subject to NEPA. The DEIR described the proposed project, identified existing conditions, described potential environmental impacts and mitigation measures, provided an expanded discussion of alternatives, and an executive summary of the project in English and in Spanish. The DEIR included an update on state, local, and federal permitting and provided a discussion of permitting requirements and the project's consistency with regulatory standards. At Massport's request, the project was subject to an extended 47-day comment period. Massport's consultant provided supplemental information identifying data and assumptions which have been updated since the ENF was submitted to facilitate MEPA review.[2] For purposes of clarity, references to the DEIR in this Certificate include this supplemental information unless otherwise referenced. Comments from state and regional agencies are generally supportive of the project and acknowledge the overall air quality benefits which will be provided by the project. Comments do not request additional analysis in the form of a Supplemental DEIR.

Though the Executive Office of Energy and Environmental Affairs' (EEA) *Environmental Justice (EJ) Policy* is not applicable to this project, Massport provided outreach consistent with the spirit and intent of the enhanced public participation provisions of the EJ Policy. Massport requested and was granted an extension of the comment period to provide additional time to review and comment on the DEIR. The DEIR included a Spanish language version of the Executive Summary and Spanish language translation was also provided at a Public Information Meeting held the evening of June 25, 2019 at the Logan Airport Rental Car Center. I encourage Massport to continue providing translated Executive Summaries with all future MEPA filings.

As described in the DEIR, the location and number of parking spaces has not changed since the ENF was filed. The DEIR included revised analyses (including updated estimates of projected reductions in VMT and air emissions) based on updated mode share data and passenger projections. The analysis in the DEIR was updated based on a future passenger forecast of 50 million air passengers (MAP) in 2030 (46.5 MAP in the ENF), with an increased HOV mode

[2] Emails sent from Stewart Dalzell (Massport) on 7/30/10 and 8/1/19 to Page Czepiga (MEPA Office).

share. The VMT analysis in the ENF assumed a 2.54 % annual passenger growth rate through 2030 while the analysis in the DEIR assumed a growth rate commensurate with the FAA's Fiscal Year (FY) 2018 Terminal Area Forecast (TAF); which represents a 3.1% passenger growth rate through 2030. The passenger mode share distribution in the DEIR assumed a 30.5% HOV mode share, consistent with the findings of the 2016 *Logan Airport Passenger Ground Access Survey* (27.8% in the ENF, based on 2013 survey data). The DEIR also assumes that Massport will continue to implement policies and programs to achieve a 40% HOV mode share goal by 2027 (37.5% in the ENF).

Alternatives Analysis

The location of the Preferred Alternative (Economy Garage, Terminal E surface lot) has not changed since the ENF was filed. The DEIR included an expanded alternatives analysis that evaluated various massing and circulation alternatives for the Terminal E garage. The massing alternatives included various combinations of four to seven levels on the garage's east and west sides. The circulation alternatives included two options to provide access/egress for public vehicles and limousines at the Terminal E garage. The DEIR did not evaluate massing or access alternatives for the Economy Garage. According to the DEIR, the massing and height of the Economy Garage was determined by FAA airspace height restrictions, structural considerations, and cost. The Preferred Alternative for the Terminal E garage includes a pedestrian bridge connection to the Central Garage with five parking levels on the west side and six parking levels on the east side of the pedestrian bridge. The garage will have two access points for public vehicles, a separate access point for limousines, and a vehicle bridge to the Central Garage complex. The vehicular bridge will be used by Massport to transfer vehicles under overflow conditions. The DEIR indicated that this direct connection will remove vehicles from on-Airport circulation, reduce on-Airport VMT, and provide air quality benefits. The Preferred Alternative for the Economy Garage will construct three additional parking levels on top of the existing structure and a six level addition on the facility's south side. The DEIR indicated that the project will provide an adequate number of parking spaces, reduce on-Airport VMT, provide operational efficiencies, is adjacent to compatible land uses and/or Airport terminals, and it will not require significant changes to existing roadway infrastructure. According to the DEIR, the project will provide sufficient parking to accommodate approximately 10 years of peak-day parking demand.

The DEIR included a brief evaluation of construction phasing and configurations. The Terminal E garage will be constructed first to achieve construction efficiencies with other construction projects at the Airport and to provide increased operational flexibility in managing the parking supply. Additionally, the parking supply in the Terminal E garage will compensate for the temporary loss of 1,000 revenue-generating parking spaces associated with centralizing TNC operations in the Central Garage complex.

Air Quality

As described in the DEIR, if the project was not constructed, the commercial parking supply would become more constrained and approximately 77% of "would-be parkers" would switch to drop-off/pick-up modes. The project is anticipated to shift mode share from drop-off/pick-up modes and result in reductions in regional off-Airport VMT and improvements to on-

Airport roadway conditions compared to the future No-Build scenario. The VMT analysis presented in the ENF assumed that all 5,000 spaces would be operational by 2022. The DEIR included a revised analysis that incorporated the construction phasing and evaluated an interim (2022; 2,000 spaces in Terminal E Garage operational) and full-build (2030; both garages operational with 5,000 spaces) scenario. As noted above, the air quality analysis was also revised since the ENF was submitted to reflect updated passenger forecasts, growth rates, and HOV mode share data. This decreased the projected VMT reduction and emissions reductions benefits compared to those presented in the ENF. The project will result in CO_2, VOC, and NO_x reductions of 10%, 11%, and 11% in 2022 and 12%, 12% and 11% in 2030 (respectively) compared to the future no-build scenario. According to the DEIR, the project will comply with the Clean Air Act General Conformity Rule, the SIP, and will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) for these pollutants. The DEIR included the results of a microscale analysis that demonstrated the carbon monoxide (CO) concentrations will be below the NAAQS for both the 1-hour and the 8-hour concentrations.

The analysis is predicated on and Massport has committed to achieving a future HOV mode share goal of 40% by 2027. The DEIR identified the following commitments which Massport plans to implement to improve HOV mode share:

- Providing preferred taxi and TNC line privileges to electric vehicles (EV);
- Training ground transportation personnel to encourage passengers to share rides;
- Increasing Logan Express capacity, measured in available seats, by 10%;
- Purchasing eight more (16 total) MBTA Silver Line buses by 2024 (dependent upon MBTA procurement); and
- Conducting the studies required in the amended Parking Freeze regulations and sharing the findings with MassDEP.

I note monitoring and reporting on the progress towards achieving the goals and success of the mitigation program can be addressed in the Long-Term Parking Management Plan and future Environmental Status and Planning Reports (ESPRs) and Environmental Data Reports (EDRs) (EEA#3247/5146). The DEIR also identified measures Massport will implement to reduce air emissions from Airport operations, including: providing high-speed EV charging stations in taxi, limousine, and TNC lots; working with airlines/tenants to convert commercially available ground source equipment (GSE) to electric power; and working with airlines to increase the use of electric tugs to 60% of aircraft that need re-positioning. I refer Massport to comments from Airlines for America which identify concerns with incorporating measures to reduce emissions from GSE into the draft Section 61 Findings for this project. Comments from the Conservation Law Foundation (CLF) identify additional measures that Massport has agreed to implement to support HOV use and reduce air emissions, including free Blue Line service from the Airport Station for employees, implementation of variable-rate parking and Airport pass-through rate (if warranted based on study results), and incentivizing ride-sharing through reduced fees.

The DEIR indicated that the MBTA Blue Line and Silver Line carry approximately 6% of passengers to/from the airport. This represents an increase of 1,900 total passengers per day in

2030. The DEIR included an analysis of the MBTA's Blue Line ability to accommodate the projected increase in passengers. The analysis assumed passenger loads grew by 1.5% per year to approximate future background growth. The analysis indicated that the Blue Line will have adequate capacity to accommodate the 135 additional weekday evening peak hour passengers boarding at the Airport Station in 2030. As the Silver Line buses are free from the Airport, boarding and alighting data is not collected. Based on this, the DEIR did not evaluate future passenger loads for the Silver Line. The DEIR indicated that Massport will continue to monitor the Logan Express and Massport operated shuttles and will expand the fleet as necessary to ensure they meet Massport customer service requirements. The DEIR indicated that the MBTA's Service Delivery Policy and Massport's policy to expand and improve the Silver Line, Logan Express, and Massport operated shuttles to meet customer service requirements will ensure that public transit services to/from the Airport will have sufficient capacity to accommodate future increases in demand.

Climate Change

Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth (EO 569; the Order) was issued on September 16, 2016. EO 569 recognizes the serious threat presented by climate change and directs agencies within the administration to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for its impacts. The Order seeks to ensure that Massachusetts will meet GHG emissions reduction limits established under the Global Warming Solution Act of 2008 (GWSA) and will work to prepare state government and cities and towns for the impacts of climate change.

The GHG Policy and requirements to analyze the effects of climate change through EIR review is an important part of a statewide strategy. These analyses advance proponents' understanding of the projects contribution and vulnerability to climate change.

Greenhouse Gas Emissions

The project is subject to review under the May 5, 2010 MEPA Greenhouse Gas Emissions Policy and Protocol ("the Policy"). The DEIR indicated that the parking garages will be naturally ventilated and that conditioned space will be limited to mechanical/electrical rooms, elevator lobbies, and cashier booths. The DEIR included a GHG analysis that quantified the CO_2 emissions associated with the project's energy use (stationary sources), primarily associated with interior and exterior lighting. Mobile source GHG emissions were calculated in a similar method as the air quality analysis and were based on the anticipated reduction in VMT under future conditions. Massport has committed to the following measures to reduce GHG emissions:

- External wayfinding system to reduce on-Airport VMT, including dynamic informational signage and a reservation system for passengers to reserve and pre-pay for a parking space;
- Internal wayfinding system to reduce in-facility circulation including parking guidance via level occupancy detection;

- Preferred parking spaces for low-emitting and fuel-efficient vehicles amounting to at least 1% of total spaces;
- Reserved parking spaces for EV amounting to at least 1% of total spaces;
- Installation of EV charging stations to accommodate 150% of demand (including construction of 15 EV charging stations in the Terminal E Garage and 5 in the Economy Garage);
- Reduced lighting power densities (LPD) of 0.09 watts/sf (W/sf) inside the parking garages;
- Occupancy sensors and photocells on all interior and exterior lighting (respectively);
- Installation of a solar photovoltaic (PV) system on the Terminal E garage;
- Relocation or replacement of existing solar PV system at the Economy Garage to the top of the facility's new highest level;
- Building Commissioning; and
- Construction waste recycling.

The solar PV array on the Economy Garage will generate 77,800 kWh/year and result in a GHG reduction of 28 tons per year (tpy). The DEIR indicated Massport will evaluate replacing the existing array with a newer and more efficient solar PV system as project design progresses. The DEIR did not evaluate expanding the footprint of the solar PV canopy. The project will also install a 10,000 sf solar PV canopy on the east side of the Terminal E garage which will generate 250,000 kWh/year and result in a GHG reduction of 89 tpy. The DEIR did not provide documentation to support the proposed size of the solar PV canopies, explain why it is not proposed on the west side of the Terminal E garage or within an increased footprint on the Central Garage, nor identify other constraints to expanding the system size. I refer Massport to comments from the Department of Energy Resources (DOER) which indicates a larger solar PV system may be feasible. Additional analysis of solar PV is required in the FEIR.

The project's stationary source GHG emissions were estimated at 1,333 tpy in the Base Case. Through the adoption of energy efficient lighting, the Preferred Alternative will reduce stationary source GHG emissions by 382 tpy, for a total of 951 tpy, or a 28.6% decrease. This does not include the offsets associated with the facilities' solar PV systems, which are identified above. The project's mobile source emissions are summarized in the below table.

Year	Condition	Regional VMT of "would be parkers"	CO_2 Emissions (tpy)
2017	Existing	327,280	153
2022	No-Build	13,584,217	5,079
	Build/Proposed Project	12,279,027	4,497
	Difference	**1,305,190 (10%)**	**582 (11%)**
2030	No-Build	52,130,253	15,126
	Build/Proposed Project	46,922,626	13,314
	Difference	**5,207,627 (10%)**	**1,812 (12%)**

The DEIR indicated the reduction in mobile source emissions is primarily attributed to the reduction in regional VMT as compared to the future No-Build Alternative. This will be achieved through shifting "would be parkers" from drop-off/pick-up modes to parking; reducing the number of trips associated with "would-be parkers" traveling to and from the Airport; reducing recirculation at the Terminal E curbsides and decreasing on-Airport VMT; and reducing on-Airport emissions related to improved curbside operations at Terminal E as air passengers shift from drop-off/pick-up modes to parking in the garages.

Adaptation and Resiliency

The DEIR included a review of the project's design measures for increasing its resiliency to the effects of climate change. The project will incorporate redundant or back-up power sources to protect against extreme weather conditions that may cause power outages. It will also include drought tolerant landscaping along the façade of the Terminal E Garage to minimize the heat island effect and reduce irrigation needs. Stormwater runoff from the Terminal E garage will be collected and used to offset a portion of cooling tower water consumption at the Central Heating Plant. The DEIR briefly described the project's consistency with Massport's Disaster and Infrastructure Resiliency Planning Study and Floodproofing Design Guide. According to the DEIR, critical equipment and infrastructure will be elevated above future projected flood elevations.

Noise

The DEIR included a noise impact assessment to evaluate the potential changes in noise due to a taller Economy Garage. Aircraft ground operations noise was modeled at 11 locations near the Economy Garage both with and without the height increase. According to the DEIR, 8 locations (located north and northwest of the Economy Garage) will experience a decrease in ground noise due to the shielding from the expansion to the Economy Garage. The remaining 3 locations (located west of the Economy Garage) may experience noise increases ranging from 0.1 to 0.4 dB due to sound from aircraft ground operations reflecting off the taller portion of the Economy Garage. The DEIR indicated that the façade of the Economy Garage will consist of a combination of solid walls and open areas which will limit the potential for noise reflection.

Construction Period

Construction of the Terminal E garage will commence in spring 2020 and will be completed in 2022. The six levels on the east side of the pedestrian bridge will be constructed first, followed by the five parking levels on the west side of the bridge. Construction of the Economy Garage expansion will begin in 2023 and be completed by the end of 2025. Construction of the Economy Garage will start at the west end of the garage and proceed towards the east end. I refer Massport to comments from MAPC which recommend constructing the Economy Garage expansion only if/when warranted by demand.

The DEIR described construction phasing and sequencing and provided additional information to identify construction period impacts and measures to control construction traffic, air quality, noise, and water impacts. The DEIR clarified that the Terminal E garage will be constructed simultaneously with the Terminal E Modernization Project (EEA# 15434) and Terminal C Canopy, Connector, and Roadway Project. The DEIR described construction equipment requirements and identified anticipated construction period trips and truck routes. The DEIR identified measures to reduce construction period traffic impacts, including: developing specific truck routes, coordinating arrival of large equipment, requiring contractors to park off-site, and development of traffic management plans. Measures to reduce construction period air quality impacts include: limiting vehicle idling, using low- or zero-emissions equipment where practicable; retrofitting construction equipment, dust suppression, stabilizing exposed areas, and suspending construction during high-wind conditions. According to the DEIR, Massport will voluntarily comply with the City of Boston's noise control regulations during construction. Portions of the project site are regulated pursuant to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). According to the DEIR, an Activity and Use Limitation (AUL) is located on the Economy Garage site and a Release Abatement Measure (RAM) Plan must be submitted with MassDEP prior to any subsurface work on this site.

SCOPE

General

The FEIR should follow Section 11.07 of the MEPA regulations for outline and content, as modified by this Scope. It should include a detailed description of the proposed project and identify, describe, and assess the environmental impacts of any changes in the project that have occurred since the filing of the DEIR. This should also identify any analysis that has been revised since the DEIR was filed based on updated data or projections. The DEIR should include updated site plans for existing and post-development conditions at a legible scale.

The FEIR should provide a brief description and analysis of applicable statutory and regulatory standards and requirements, and describe how the project will meet those standards. It should include a list of required State Permits, Financial Assistance, or other State approvals and provide an update on the status of each of these pending actions. The FEIR should confirm the need for a modified Sewer Use Discharge Permit from the MWRA and include updated mitigation measures and draft Section 61 Findings, as appropriate.

Project Description and Permitting

The FEIR should include site plans for existing and post-development conditions at a legible scale including the proposed garage structures and any curbside improvements and changes to the on-airport roadways. The project description should address access and revenue control systems; anticipated rate structures; and identify hybrid, alternative fuel, and EV parking locations. The 2017 ESPR was filed with the MEPA Office during review of the DEIR. The FEIR should confirm that the analyses presented in the DEIR used the most recent data, projections, and assumptions presented in the 2017 ESPR or should include revised analyses, as necessary.

The amended Parking Freeze regulations require Massport to complete three studies to identify ways to further support alternative transit options to the Airport. The results of these studies can inform ways to further support alternative transit options to and from the Airport and extend the associated air quality benefits of the project. Massport anticipates completing the studies by September 30, 2019. As described above, the FEIR should include the completed studies and a summary of the findings. It should also describe how the results have informed Massport's long-range efforts to address VMT and air quality impacts of different ground access modes to and from the Airport and identify measures that Massport has already implemented. The data and findings should be integrated into the FEIR and mitigation commitments should be updated, as appropriate.

Air Quality

The air quality analysis in the DEIR assumed that the policies and programs undertaken by Massport will achieve a 40% HOV mode share goal by 2027. The FEIR should describe how HOV mode share will be monitored to evaluate the effectiveness of the policies and programs in achieving this goal. The FEIR should demonstrate that the HOV programs/policies and any proposed HOV improvement measures will provide the capacity to meet demand associated with growth. Massport has made significant investments in programs to maintain and increase HOV modes and has been recognized as one of the top-ranking airports in terms of HOV/transit mode share. To support Massport's investments and extend their benefits, the FEIR should include an evaluation of measures to support HOV use and extend the associated air quality benefits of the program and identify to what extent these measures will contribute towards attaining the future mode share goal. This evaluation can be supported by the findings of the three studies required by the amended Parking Freeze regulations.

Greenhouse Gas (GHG) Emissions

As recommended by DOER, the FEIR should analyze the feasibility and GHG mitigation benefits of expanding the proposed canopy solar PV arrays. The analysis should estimate the area available for solar canopies on each of the top parking levels, state the assumed panel efficiency, estimate the electrical output of the system, and identify associated GHG reductions. The analysis should be supported by conceptual plans that identify the "usable areas" for potential solar PV canopy systems and other appurtenances. The analysis should evaluate the east and west sides of the Terminal E Garage and the entire top level of the Economy Garage. The analysis should include a narrative and data (such as a solar reflection study/glare analysis) to support the Proponent's adoption (or dismissal) of solar PV as a feasible measure to avoid, minimize or mitigate project-related GHG emissions and Damage to the Environment. As recommended by DOER, the project should be designed and built to accommodate solar in the future so as not to lose a significant rooftop asset in the event that issues effecting feasibility change.

The DEIR included a commitment to install EV charging stations to accommodate 150% of demand. The FEIR should clarify whether this commitment to meet 150% of demand extends to all on-Airport demand or is limited to the Terminal E Garage and Economy Garage. The FEIR should describe how demand for EV charging stations will be monitored and identify triggers for installation of additional EV stations. The FEIR should clarify whether the parking garages will be constructed as "EV-ready" with conduit to support future installation of EV charging station or discuss how the construction and design of the garage could otherwise facilitate future expansion of EV charging stations if warranted by demand. This was requested in the Scope for the DEIR and was not provided.

The FEIR should identify the specific measures from the U.S. Green Building Council's Parksmart program which will be incorporated into the structured parking facilities.

The FEIR should provide an updated emission table that compares base case GHG emissions with the Preferred Alternative showing the anticipated reduction in tpy and percentage by emissions source (stationary and mobile).

Construction Period Impacts

The FEIR should describe how construction will occur to avoid impacting the existing constrained parking supply. The FEIR should describe how it will comply with M.G.L. c. 21E during construction, including any applicable AULs. As recommended by EPA, the FEIR should confirm that Massport will require its construction contractors to use Ultra Low Sulfur Diesel fuel, and discuss the use of after-engine emissions controls, such as oxidation catalysts or diesel particulate filters. Off-road vehicles are required to use ultra-low sulfur diesel fuel (ULSD).

Mitigation and Draft Section 61 Findings

The FEIR should include a separate chapter summarizing proposed mitigation measures. This chapter should also include draft Section 61 Findings for each area of impact associated with Massport's Preferred Alternative. It should include a draft Section 61 Finding for use by the MWRA in issuing the modified Sewer Use Discharge Permit (if required). The FEIR should contain clear commitments to implement these mitigation measures, estimate the individual costs of each proposed measure, identify the parties responsible for implementation (either funding design and construction or performing actual construction), and a schedule for implementation. To ensure that all GHG emissions reduction measures adopted by the Proponent in the Preferred Alternative are actually constructed or performed by the Proponent, I require Proponents to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. The commitment to provide this self-certification in the manner outlined above should be incorporated into the draft Section 61 Findings included in the DEIR.

Response to Comments

The FEIR should contain a copy of this Certificate and a copy of each comment letter received on the DEIR. In order to ensure that the issues raised by commenters are addressed, the FEIR should include direct responses to these comments to the extent that they are within MEPA jurisdiction. This directive is not intended, and shall not be construed, to enlarge the scope of the FEIR beyond what has been expressly identified in this Certificate. The response can refer to future EDRs and/or ESPRs to address issues that are not within the FEIR Scope. I recommend that Massport employ an indexed response to comments format, supplemented as appropriate with direct narrative response.

Circulation

Massport should circulate the FEIR to those parties who commented on the ENF and/or the DEIR, to any State Agencies from which the Proponent will seek permits or approvals, and to any parties specified in section 11.16 of the MEPA regulations. Massport may circulate copies of the FEIR to commenters other than State Agencies in a digital format (e.g., CD-ROM, USB drive) or post to an online website. However, Massport should make available a reasonable number of hard copies to accommodate those without convenient access to a computer to be distributed upon request on a first come, first served basis. Massport should send a letter accompanying the digital copy or identifying the web address of the online version of the FEIR indicating that hard copies are available upon request, noting relevant comment deadlines, and appropriate addresses for submission of comments. The FEIR submitted to the MEPA office should include a digital copy of the complete document. A copy of the FEIR should be made available for review at the following Libraries: Boston Public Library – Main, Orient Heights, and East Boson Branches, Chelsea Public Library, Winthrop Public Library, and Revere Public Library.

August 2, 2019	K. Theoharides
Date	Kathleen A. Theoharides

Comments received:

06/26/2019	John Vitagliano
07/25/2019	Environmental Protection Agency (EPA)
07/26/2019	Airlines for America
07/26/2019	Conservation Law Foundation (CLF)
07/26/2019	Metropolitan Area Planning Council (MAPC)
08/01/2019	Massachusetts Department of Environmental Protection (MassDEP)
08/02/2019	Department of Energy Resources (DOER)
08/02/2019	Air Impact Relief, Inc. (AIR)

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Copy of the Secretary of the Executive Office of Energy and Environmental Affairs Certificate issued for the *Logan Airport Parking Project Final Environmental Impact Report*

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The Commonwealth of Massachusetts

Executive Office of Energy and Environmental Affairs
100 Cambridge Street, Suite 900
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January 30, 2020

CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ON THE
FINAL ENVIRONMENTAL IMPACT REPORT

PROJECT NAME	: Logan Airport Parking Project
PROJECT MUNICIPALITY	: Boston
PROJECT WATERSHED	: Boston Harbor
EEA NUMBER	: 15665
PROJECT PROPONENT	: Massachusetts Port Authority (Massport)
DATE NOTICED IN MONITOR	: December 23, 2019

Pursuant to the Massachusetts Environmental Policy Act (MEPA; M.G.L. c. 30, ss. 61-62I) and Section 11.08 of the MEPA Regulations (301 CMR 11.00), I have reviewed the Final Environmental Impact Report (FEIR) and hereby determine that it **adequately and properly complies** with MEPA and its implementing regulations.

Project Description

As described in the FEIR, the project includes the phased construction of 5,000 additional commercial parking spaces at the Logan International Airport (the "Airport"). The project will construct a structured parking garage with 2,000 parking spaces in the location of the existing Terminal E surface parking lot followed by the addition of 3,000 new spaces at the Economy Garage through expansion of the existing facility. The Terminal E Garage will open in 2022 and the Economy Garage expansion will open by the end of 2025. The parking spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport. According to the FEIR, the project will reduce drop-off/pick-up activity at the Airport and will reduce regional air-passenger-related vehicle miles traveled (VMT) and associated air emissions.

In addition to the overall air quality benefits, the FEIR indicated that Massport is implementing additional high occupancy vehicle (HOV) mode improvement measures in conjunction with this project. These HOV mode improvement measures include trip reduction strategies that target different methods in how people get to the airport. Parking strategies are one part of the overall trip reduction strategies which includes enhancing Logan Express bus service through expanded parking at existing locations and increased frequency of service, and expanding the Logan Express service area to new suburban locations and urban/downtown areas based on the success of the Back Bay Logan Express pilot program. The FEIR also indicated that Massport has committed to purchase additional Silver Line buses to increase service capacity to the Airport. Additionally, Massport has just began in December 2019 to centralize transportation network company (TNC) (e.g. Uber, Lyft, etc.) operations (i.e. drop-offs and pick-ups) on the ground floor of the Central Garage complex to reduce congestion outside the terminals. Finally, Massport is evaluating mechanism to decrease the number of TNC drivers that leave the Airport without a passenger (i.e., deadhead trips). These mechanisms include both a program called "rematch" at the Central Garage where TNC drivers come in and drop off passengers for the Airport and then the driver is paired up with a passenger who is leaving the Airport, and also a new fee structure for TNCs that decreases the cost of the ride if the TNC driver does a drop-off and then a pick-up.

Project Background and Context

The number of commercial and employee parking spaces allowed at Logan Airport is regulated by the Massachusetts Department of Environmental Protection (MassDEP) through the Massport/Logan Airport Parking Freeze (310 CMR 7.30), an element of the Massachusetts State Implementation Plan (SIP) under the federal Clean Air Act. As previously described in the Environmental Notification Form (ENF) and the Draft EIR (DEIR), peak daily demand for on-Airport (on-site) parking was increasing, resulting in daily demand frequently nearing the Logan Airport Parking Freeze cap. Massport worked with MassDEP on an amendment to the Parking Freeze. The ENF was filed concurrent with MassDEP's issuance of a draft regulation to amend the Parking Freeze to allow the creation of an additional 5,000 commercial parking spaces at the Airport. After the Certificate on the ENF was issued, MassDEP approved the requested parking increase and promulgated the amended regulation on June 30, 2017. The EPA issued a proposed rule approving the revision of the SIP and incorporating the amended Parking Freeze on March 6, 2018, and the rule went into effect on April 5, 2018. The MassDEP regulations provide the larger framework setting overall caps for the Logan Airport Parking Freeze, while project-specific impacts and mitigation measures were intended to be analyzed through the MEPA review process for the Logan Airport Parking Project.

The approved regulations increased the Logan Airport commercial parking limit by 5,000 spaces (from 18,640 to 23,640 spaces) and increased the total cap to 26,088 commercial and employee parking spaces (comprised of 23,640 commercial spaces and 2,448 employee parking spaces). The regulations (310 CMR 7.30(8)) required that Massport complete the following studies, which were completed on September 30, 2019, to identify ways to further support alternative transit options to the airport:

1. A study to evaluate the costs, feasibility, and effectiveness of potential measures to improve HOV access to the Airport. The study should consider, among other things,

possible improvements to Logan Express bus service and the benefits of adding Silver Line buses with service to the Airport.

2. A study of costs and pricing for different modes of transportation to and from the Airport to identify a pricing structure and the use of revenues so generated to promote the use of HOV modes of transportation by air travelers and visitors to the Airport. The study will include evaluation of short-term and long-term parking rates and their influence on different modes of Airport transportation.
3. A study of the feasibility and effectiveness of potential operational measures to reduce non-high occupancy vehicle pick-up/drop-off modes of transportation to the Airport, including an evaluation of emerging ride-sharing and transportation network company modes.

Logan Airport and Project Site

The Airport boundary encompasses approximately 2,400 acres in East Boston and Winthrop, including approximately 700 acres underwater in Boston Harbor. The airfield is comprised of six runways and approximately 15 miles of taxiway. Logan Airport has four passenger terminals, A, B, C, and E, each with its own ticketing, baggage claim, and ground transportation facilities. The Airport is surrounded on three sides by Boston Harbor and is accessible by two public transit lines and the roadway system. The preferred locations for the parking structures are the Economy Garage and the Terminal E surface parking lot. The Economy Garage is located in the northwest portion of the Airport campus at the intersection of Service Road and Prescott Street. It is comprised of two levels and provides over 2,700 spaces. The Economy Garage has an existing rooftop solar photovoltaic (PV) system on its top level which will be relocated or replaced on the top level of the garage following construction. The Terminal E surface parking lot is located within the Airport interior and adjacent to Terminal E.

The Airport is served by several Massachusetts Bay Transportation Authority (MBTA) public transit routes, including Blue and Silver Lines for the rapid transit system, commuter ferry service, and local and express bus routes. Specifically, Massport provides free shuttle service between the Blue Line Airport Station and all Airport terminals and subsidizes the Silver Line Logan Airport Route (SL1) by providing free outbound Silver Line trips from the Airport on eight Silver Line buses purchased for this route by Massport. Massport also operates an extensive Logan Express Bus service, serving five locations. The airport is also served by other private express bus service and intercity bus service as part of the range of HOV modes available for ground access.

The Economy Garage and the Terminal E parking lot sites are both located within the coastal zone of Massachusetts. Both locations are comprised of previously disturbed impervious area. They are not located in Priority or Estimated Habitat as mapped by the Division of Fisheries and Wildlife's (DFW) Natural Heritage and Endangered Species Program (NHESP). The parking lot sites do not contain wetland resource areas regulated pursuant to the Wetland Protect Act and its implementing regulations (310 CMR 10.00).

Environmental Impacts and Mitigation

The project includes construction of 5,000 new commercial parking spaces at two locations. The project is located within previously altered impervious area and will not create new impervious area. The new spaces are intended to accommodate existing and anticipated air passenger demand for parking at the Airport while minimizing pick-up and drop-off activity and decreasing regional air passenger-related VMT and associated vehicle emissions. The project will reduce carbon dioxide (CO_2), volatile organic compounds (VOC), and oxides of nitrogen (NO_x) emissions by 10%, 11%, and 11%, respectively, in 2022 when the first 2,000 parking spaces are constructed and 12%, 12% and 11%, respectively, in 2030 when all 5,000 spaces are constructed, as compared to the future No-Build Alternative.

In addition to the overall project benefits in reducing air pollution, Massport is undertaking additional HOV measures in conjunction with the construction of the proposed 5,000 parking spaces. These include: enhancing and expanding existing Logan Express scheduled bus service; exploring Logan Express scheduled bus service in the urban/downtown area; and investing in additional MBTA Silver Line buses.

Jurisdiction and Permitting

The project is undergoing MEPA review and requires preparation of a mandatory EIR pursuant to 301 CMR 11.03(6)(a)(7) because it will be undertaken by a State Agency and will construct greater than 1,000 parking spaces in a single location.

The project may require a Sewer Permit Modification from the Boston Water and Sewer Commission (BWSC). The project may be subject to Massachusetts Office of Coastal Zone Management (CZM) federal consistency review. The project requires approval by the Federal Aviation Administration (FAA) for changes to the Airport Layout Plan and, therefore, requires an Environmental Assessment (EA) under the National Environmental Policy Act (NEPA). The project also requires a National Pollutant Discharge Elimination System (NPDES) General Permit for Construction from the EPA.

Because the project will be undertaken by a State Agency, MEPA jurisdiction is broad in scope and extends to all aspects of the project that may cause Damage to the Environment, as defined in the MEPA regulations.

Changes since the Filing of the DEIR

The FEIR identified changes to the project since the DEIR was filed. Changes to the new garage in front of Terminal E include a plan is to install an approximately 20,000-square foot (sf) solar PV installation on the garage's eastside. This is an increase from the 10,000-sf solar PV installation proposed in the DEIR. This expanded solar PV system will produce approximately 467,000 kilowatt-hours (kWh) per year, or about 217,000 kWh per year more than the system proposed in the DEIR. This expanded system will offset 50 percent of the proposed garage's total energy (i.e., electricity and natural gas) consumption. In addition, the project will now include construction of additional electric vehicles (EV) charging stations. The DEIR indicated that Massport would install 15 single-port EV charging stations at the new garage in front of Terminal E. The FEIR indicates that Massport, instead, will install 11 double-port stations at this location to accommodate 22 dedicated EV charging parking spaces. As demand grows, Massport will add EV charging stations to ensure that the garage can accommodate 150 percent of demand.

Changes to the design of the Economy Garage expansion since the filing of the DEIR relate to advancing installation of the additional EV charging stations. The additional EV infrastructure was accelerated to take place at the existing Economy Garage with construction that began in 2019. Massport will also increase the number of EV charging stations as part of the Economy Garage expansion to accommodate 150 percent of demand. Massport has committed to reevaluate the need for the additional 3,000 parking spaces planned as part of the Economy Garage expansion prior to beginning that facility's design and construction process.

Review of the FEIR

Massport filed a joint FEIR and Final Environmental Assessment (Final EIR/EA) to satisfy MEPA, NEPA, and the Federal Aviation Administration's (FAA's) implementing procedures (Order 1050.1F and Order 5050.4B).

This Certificate applies to the review of the project under MEPA only, and does not restrict the ability of the federal government to act on those aspects of the project subject to NEPA or FAA rules. The FEIR described the proposed project, identified existing conditions, described potential environmental impacts and mitigation measures, and provided an expanded discussion of greenhouse gas (GHG) emissions. The FEIR included an update on state, local, and federal permitting and provided a discussion of permitting requirements and the project's consistency with regulatory standards.

Though the Executive Office of Energy and Environmental Affairs' (EEA) *Environmental Justice (EJ) Policy* is not applicable to this project, Massport conducted outreach consistent with the enhanced public participation provisions of the EJ Policy including providing translators at all public meetings, notice of availability of the ENF, DEIR and FEIR in local newspapers in several languages, and translation of the Executive Summary/Introduction for the ENF, DEIR and FEIR.

Alternatives Analysis

The location of the Preferred Alternative (Economy Garage, Terminal E surface lot) has not changed since the ENF was filed. The DEIR included an expanded alternatives analysis that evaluated various massing and circulation alternatives for the Terminal E garage which was expanded in the FEIR. The ENF indicated that the planning process considered six alternative on-airport locations for the structured parking facilities. All of the sites are paved and developed areas that are currently used for parking or vehicle storage. The ENF indicated that each of the sites are comparable in terms of regional VMT and emissions reductions since regional access routes will not vary as a result of the garage siting.

- Harborside Drive – Structured parking in location of existing vehicle layover space
- Porter Street – Structured parking over existing taxi pool
- North Cargo Area – Expand Economy Garage in the location of existing surface parking and the Massachusetts State Police building

- Southwest Service Area – Structured parking in location of current bus/limousine pool and overflow parking
- Economy Garage (Preferred Alternative) – Additional spaces above existing garage
- Terminal E Surface Lot (Preferred Alternative) – Structured parking in location of existing surface parking lot

According to the ENF, the Preferred Alternative was selected based on input from the East Boston Logan Impact Advisory Group (LIAG). The ENF indicated that Harborside Drive and Porter Street sites were eliminated due to potential wayfinding and operational challenges and the North Cargo Area was eliminated due to the need to relocate the existing uses. The Southwest Service Area was eliminated as it would require construction of a new parking structure and integration of existing uses into the ground floor. The ENF indicated that the No-Build alternative was eliminated as it would result in higher pollutant emissions and roadway congestion due to the higher VMT associated with the drop-off/pick-up mode. The ENF identified the Economy Garage and Terminal E Surface Lots as the Preferred Alternative. The ENF indicated the Economy Garage location was selected as the Preferred Alternative because the site access is well defined, it does not require significant changes to existing roadway infrastructure, and it is adjacent to compatible land uses and the Terminal E Surface Lot location was selected due to its proximity to Airport terminals, compatibility with adjacent land uses, and location within the Airport interior to minimize impacts to adjacent communities.

The location of the Preferred Alternative (Economy Garage, Terminal E surface lot) has not changed since the DEIR was filed. The massing and height of the Economy Garage was determined by FAA airspace height restrictions, structural considerations, and cost. The Preferred Alternative for the Terminal E garage includes a pedestrian bridge connection to the Central Garage with five parking levels on the west side and six parking levels on the east side of the pedestrian bridge. The garage will have two access points for public vehicles, a separate access point for limousines, and a vehicle bridge to the Central Garage complex. The vehicular bridge will be used by Massport to transfer vehicles under overflow conditions. This direct connection will remove vehicles from on-Airport circulation, reduce on-Airport VMT, and provide air quality benefits. The Preferred Alternative for the Economy Garage will construct three additional parking levels on top of the existing structure and a six level addition on the facility's south side. The FEIR indicates that the project will provide an adequate number of parking spaces, reduce on-Airport VMT, and provide operational efficiencies; it is also adjacent to compatible land uses and/or Airport terminals, and will not require significant changes to existing roadway infrastructure. According to the FEIR, the project will provide sufficient parking to accommodate approximately 10 years of peak-day parking demand.

The Terminal E garage will be constructed first to achieve construction efficiencies with other construction projects at the Airport and to provide increased operational flexibility in managing the parking supply. Additionally, the parking supply in the Terminal E garage will compensate for the loss of 1,000 revenue-generating parking spaces associated with centralizing TNC operations in the Central Garage complex.

Air Quality

As described in the FEIR, if the project were not constructed, the commercial parking supply would become more constrained and approximately 77% of "would-be parkers" would switch to drop-off/pick-up modes. The project is anticipated to shift mode share from drop-off/pick-up modes and result in reductions in regional off-Airport VMT and improvements to on-Airport roadway conditions compared to the future No-Build scenario. The VMT analysis presented in the ENF assumed that all 5,000 spaces would be operational by 2022. The DEIR included a revised analysis that incorporated construction phasing and evaluated both interim (2022; 2,000 spaces in Terminal E Garage operational) and full-build (2030; both garages operational with 5,000 spaces) scenarios which remain the same in the FEIR. As noted, the project is expected to result in CO_2, VOC, and NO_x reductions of 10%, 11%, and 11%, respectively, in 2022 and 12%, 12% and 11%, respectively, in 2030, compared to the future no-build scenario. According to the FEIR, the project will comply with the Clean Air Act General Conformity Rule, the SIP, and will not cause or contribute to a violation of the National Ambient Air Quality Standards (NAAQS) for these pollutants. The FEIR also presented the results of a microscale analysis, which demonstrated the carbon monoxide (CO) concentrations will be below the NAAQS for both the 1-hour and the 8-hour concentrations.

The analysis is predicated on and Massport has committed to achieving a future HOV mode share goal of 40% by 2027. The FEIR identified the following commitments which Massport plans to implement to improve HOV mode share:

- Providing preferred taxi and TNC line privileges to electric vehicles (EV);
- Training ground transportation personnel to encourage passengers to share rides;
- Increasing Logan Express capacity, measured in available seats, by 10%; and,
- Purchasing eight more (16 total) MBTA Silver Line buses by 2024 (dependent upon MBTA procurement).

The FEIR also provides a summary of what Massport has already begun implementing to improve HOV mode share including:

- Relocating Back Bay Logan Express service to the MBTA's Back Bay Station, eliminating the fare from the Airport to Back Bay, and reducing the fare from Back Bay to the Airport from $7.50 to $3.00. This has already resulted in a substantial increase in ridership since the relocation in May 2019.
- Increasing peak-hour frequency on the Logan Express Braintree service from 30-minute to 20-minute headways.
- Advancing a new urban Logan Express service at North Station with free service from the Airport. Buses for the service have been ordered.
- Offering priority access at the Airport Security Line to customers who take Back Bay Logan Express or any mode of water transportation to the Airport.
- Initiating studies of a new suburban Logan Express location with parking.
- Implementing a new Ride App drop-off fee of $3.25 (in addition to the current $3.25 pick-up fee) and providing a discounted fee of $1.50 for shared-ride (such as UberPool and Lyft Line) customers.
- Implementing parking pricing that discourages short-term parking that is associated with pick-up and drop off uses.

- Piloting use of the South Boston Waterfront Emergency Access Ramp to reduce travel time on the MBTA Silver Line service to help encourage use.
- Consolidating Ride App operations at dedicated areas on the ground floor of the Central Garage to make it easier for drivers to pick up arriving air passengers after dropping off departing passengers without having to circulate around the Airport.

I note that further monitoring and reporting on the progress towards achieving the goals and success of the mitigation program can be addressed in future Environmental Status and Planning Reports (ESPRs) and Environmental Data Reports (EDRs) (EEA#3247). The ESPR provides analysis of the environmental impacts associated with current and projected activity levels and presents a comprehensive strategy to minimize impacts. The ESPR analysis is supplemented by (and ultimately incorporates) the detailed analyses and mitigation commitments of project specific EIRs. The ESPR is generally updated on a five-year basis. The EDRs are filed in the years between ESPRs. The EDR is a retrospective document that is filed annually and identifies environmental impacts based on actual passenger activity and operations.

In addition to Massports' mitigation measures for this project, Massport has committed to implement additional measures to reduce air emissions from Airport operations, including: providing high-speed EV charging stations in taxi, limousine, and TNC lots; working with airlines/tenants to convert commercially available ground source equipment (GSE) to electric power; and working with airlines to increase the use of electric tugs to 60% of aircraft that need re-positioning.

I refer Massport to comments from the Metropolitan Area Planning Council (MAPC) which identify methods for incorporating measures to reduce emissions for this project and methods for Massport's notification when reevaluating the need for the additional 3,000 parking spaces planned as part of the Economy Garage expansion prior to the start of its construction. Comments from the Conservation Law Foundation (CLF) identify additional measures that Massport has agreed to implement to support HOV use and reduce air emissions, including free Blue Line service from the Airport Station for employees, implementation of variable-rate parking and Airport pass-through rate (if warranted based on study results), and incentivizing ride-sharing through reduced fees.

Climate Change

Executive Order 569: Establishing an Integrated Climate Change Strategy for the Commonwealth (EO 569; the Order) was issued on September 16, 2016. EO 569 recognizes the serious threat presented by climate change and directs agencies within the administration to develop and implement an integrated strategy that leverages state resources to combat climate change and prepare for its impacts. The Order seeks to ensure that Massachusetts will meet GHG emissions reduction limits established under the Global Warming Solution Act of 2008 (GWSA) and will work to prepare state government and cities and towns for the impacts of climate change.

The GHG Policy and requirements to analyze the effects of climate change through EIR review is an important part of a statewide strategy. These analyses advance proponents' understanding of the projects' contribution and vulnerability to climate change.

Greenhouse Gas Emissions

The project is subject to review under the May 5, 2010 MEPA Greenhouse Gas Emissions Policy and Protocol ("the Policy"). The parking garages will be naturally ventilated and airconditioned space in both will be limited to mechanical/electrical rooms, elevator lobbies, and cashier booths.

The DEIR included a GHG analysis that quantified the CO_2 emissions associated with the project's energy use (stationary sources), primarily associated with interior and exterior lighting. Mobile source GHG emissions were calculated using a similar method as the air quality analysis and were based on the anticipated reduction in VMT under future conditions. The Scope detailed in the DEIR required that FEIR should include analysis on the feasibility and GHG mitigation benefits of expanding the proposed canopy solar PV arrays as recommended by Department of Energy Resources (DOER) during the review of the DEIR.

The analysis provided in the FEIR estimates the area available for solar canopies on each of the top parking levels, states the assumed panel efficiency, estimates the electrical output of the system, and identifies associated GHG reductions. The analysis is also supported by conceptual plans that identify the "usable areas" for potential solar PV canopy systems and other appurtenances. The analysis presented in the FEIR evaluates the east and west sides of the Terminal E Garage and the entire top level of the Economy Garage.

The project's stationary source GHG emissions were estimated at 1,337 tpy in the Base Case. The Preferred Alternative will reduce stationary source GHG emissions by 367 tpy, for a total of 970 tpy, or a 32.5% decrease. The project's mobile source emissions have not changed from the review of the DEIR and are summarized in the below table.

Year	Condition	Regional VMT of "would be parkers"	CO_2 Emissions (tpy)
2017	Existing	327,280	153
2022	No-Build	13,584,217	5,079
	Build/Proposed Project	12,279,027	4,497
	Difference	**1,305,190 (-10%)**	**582 (-11%)**
2030	No-Build	52,130,253	15,126
	Build/Proposed Project	46,922,626	13,314
	Difference	**5,207,627 (-10%)**	**1,812 (-12%)**

The reduction in mobile source emissions is primarily attributed to the reduction in regional VMT as compared to the future No-Build Alternative. As described above, this will be achieved through shifting "would be parkers" from drop-off/pick-up modes to parking; reducing the number of trips associated with "would-be parkers" traveling to and from the Airport; reducing recirculation at the Terminal E curbsides and decreasing on-Airport VMT; and reducing on-Airport emissions related to improved curbside operations at Terminal E as air passengers shift from drop-off/pick-up modes to parking in the garages.

Adaptation and Resiliency

The project's design incorporates measures for increasing its resiliency to the effects of climate change. The project will incorporate redundant or back-up power sources to protect against extreme weather conditions that may cause power outages. It will also include drought tolerant landscaping along the façade of the Terminal E Garage to minimize the heat island effect and reduce irrigation needs. Stormwater runoff from the Terminal E garage will be collected and used to offset a portion of cooling tower water consumption at the Central Heating Plant. The project will be consistent with Massport's Disaster and Infrastructure Resiliency Planning Study and Floodproofing Design Guide. Critical equipment and infrastructure will be elevated above future projected flood elevations. Critical infrastructure that will raised above the designated design flood elevation for the new facilities, as defined by Massport's Floodproofing Design Guide, include incoming electrical and telecommunications lines.

Construction Period

Construction of the Terminal E garage will commence in spring 2020 and will be completed in 2022. The six levels on the east side of the pedestrian bridge will be constructed first, followed by the five parking levels on the west side of the bridge. Massport has agreed to reevaluate the need for the additional 3,000 parking spaces planned as part of the Economy Garage expansion prior to the start of its construction. Currently construction of the Economy Garage expansion will begin in 2023 and be completed by the end of 2025. Construction of the Economy Garage will start at the west end of the garage and proceed towards the east end. I refer Massport to comments from MAPC which recommend constructing the Economy Garage expansion only if/when warranted by demand.

The Terminal E garage will be constructed simultaneously with the Terminal E Modernization Project (EEA# 15434) and Terminal C Canopy, Connector, and Roadway Project. Massport has committed to measures to reduce construction period traffic impacts, including: developing specific truck routes, coordinating arrival of large equipment, requiring contractors to park off-site, and development of traffic management plans. Measures to reduce construction period air quality impacts include: limiting vehicle idling, using low- or zero-emissions equipment where practicable; retrofitting construction equipment, dust suppression, stabilizing exposed areas, and suspending construction during high-wind conditions. Massport will also voluntarily comply with the City of Boston's noise control regulations during construction. Portions of the project site are regulated pursuant to the Massachusetts Contingency Plan (MCP; 310 CMR 40.0000). An Activity and Use Limitation (AUL) is located on the Economy Garage site. Therefore, a Release Abatement Measure (RAM) Plan must be submitted to MassDEP prior to any subsurface work on this site.

Mitigation and Draft Section 61 Findings

The FEIR includes a separate chapter summarizing proposed mitigation measures. The FEIR also includes an Appendix with draft Section 61 Findings for each area of impact associated with Massport's Preferred Alternative. The FEIR contains clear commitments to implement these mitigation measures, estimates the individual costs of each proposed measure, identifies the parties responsible for implementation (either funding design and construction or performing actual construction), and a schedule for implementation. To ensure that all GHG emissions reduction measures adopted by Massport in the Preferred Alternative are actually constructed or performed by Massport, Massport has agreed to provide a self-certification to the MEPA Office indicating that all of the required mitigation measures, or their equivalent, have been completed. A summary of the measures Massport has committed to implement to avoid, minimize, and mitigate, environmental impacts is provided below. Refer to Appendix C Table 1 on page C-6 of the FEIR for a description which also estimates the individual costs of each proposed measure and identifies the parties responsible for implementation.

Ground Access Improvement and Trip Reduction

- Advance the electrification of ground service equipment, pursuant to which all ground service equipment will be replaced no later than the end of 2027 (as available);
- Expand Logan Express capacity by 10 percent; and,
- Increase the percentage of zero emission taxi, livery, and Ride App vehicles (i.e., those associated with companies such as Uber and Lyft) by providing: high-speed electric vehicle charging stations at all taxi, livery, and Ride App pools; and taxi and Ride App queue priority to electric vehicles (subject to negotiation with companies).

Project Planning and Design

- Accommodating existing and anticipated air passenger demand for parking to reduce the environmentally undesirable drop-off/pick-up mode share and its associated vehicle miles traveled (VMT) and on and off-Airport air emissions;
- Reusing existing developed areas (i.e., the Project sites avoid undeveloped, greenfield lands);
- Selecting Project sites with community input that are in areas already used for parking (i.e., not introducing a new use), are on existing bus/shuttle routes, and are separated from nearby residential communities;
- Providing added noise barrier benefits to nearby residences and recreation areas, in conjunction with the Terminal E Modernization Project, through the expansion of the existing Economy Garage;
- Providing drivers with roadway and parking information through internal and external wayfinding systems to reduce on- Airport and in-garage circulation, as well as associated VMT and air emissions;
- Providing convenient passenger access between the new garage in front of Terminal E and the terminal buildings and to the pedestrian bridge that connects Terminal E to the Central Garage complex (which includes the West and Central Garages);
- Incorporating the following ground access features into the design of the new garage in front of Terminal E: a secondary entrance for public parkers to reduce on-Airport recirculation and associated VMT; a vehicular bridge connected to the Central Garage complex to enable more efficient operational movements by Massport's Ground Transportation Unit; relying on existing roadway infrastructure, bus routes, and signage for the Economy Garage expansion; and, encouraging parkers to pay their fees prior to returning to their vehicles via Massport's pay-by-foot system, which uses automated kiosks to enable the efficient flow of vehicles exiting the garages and reduce vehicle idling and associated air emissions.

Climate Change Adaptation and Resiliency/ Greenhouse Gas Emissions

- Incorporating measures from the U.S. Green Building Council's (USGBC) Parksmart rating system into the Project's technology, structural design, and operation;
- Reducing lighting power densities from a base of 0.19 watts per square foot to a maximum of 0.05 watts per square foot;
- Installing occupancy sensors and photocells on all applicable interior and exterior lighting;
- Installing programmable thermostats, where applicable (i.e., mechanical/electrical rooms);
- Conditioning electrical and telecommunications rooms with split system heat pumps capable of operating at or below temperature of 0°F;
- Designing the parking decks to be open air, negating the need for ventilation systems
- Performing building commissioning in accordance with ASHRAE Guideline 0-2005 and ASHRAE Guideline 1.1-2007;
- Incorporating a solar PV system at the new garage in front of Terminal E capable of offsetting 50 percent of the facility's total energy consumption, including all lighting and power required for its electric vehicle (EV) charging stations;
- Relocating the existing solar PV system at the Economy Garage to the top of the facility's new highest level upon completion of Project construction (the installation of a newer, more efficient system will be evaluated for feasibility as that construction period gets closer);
- Designing and building the proposed garages to accommodate expanded solar in the future as it becomes more cost effective/feasible;
- Reserving parking spaces for alternative fuel vehicles (e.g., EVs) amounting to at least 1 percent of total spaces and assigning preferred parking spaces for other low-emitting and fuel-efficient vehicles amounting to at least another 1 percent of total spaces;
- Installing 11 EV charging stations (22 ports) in the new garage in front of Terminal E;
- Designing and building the proposed garages to accommodate expanded EV charging infrastructure to accommodate 150 percent of demand;
- Providing tire inflation services for each garage to promote increased fuel efficiency and vehicle safety;
- Integrating vertical landscaping into the façade of the new garage in front of Terminal E;
- Planting water-conserving ground landscapes that apply the principles of xeriscaping (e.g., use of native plants);
- Specifying water efficient fixtures and faucets in a staff restroom at the new garage in front of Terminal E;
- Applying durable design principles to extend the facilities' lifespan and avoid greenhouse gas emissions caused by future large-scale construction and renovation activities;
- Preparing/adhering to a preventative maintenance plan to extend facility lifespan and avoid greenhouse gas emissions caused by future large-scale construction and renovation activities;
- Installing and applying only no- or low-volatile organic compound (VOC) coatings, paints, and sealants;
- Installing halon-free fire suppression systems in each garage Massport/ Construction;

- Complying with Massport's Floodproofing Design Guide and elevating critical equipment and systems above the designated design flood elevations;
- Ensuring redundant or back-up power sources to reduce disruption from extreme weather conditions that may cause power outage;
- Performing frequent sweeping (at least monthly) to reduce the need for constant pressure washing and associated water use;
- Implementing an active recycling program to reduce the amount of waste sent to regional landfills/incinerators and to reduce GHG associated with material disposal;
- Displaying educational materials to convey the facilities' environmentally sustainable design and operations;
- Participating in a recognized sustainable purchasing buying program applicable to non-capital equipment/materials; and,
- Implementing environmentally safe cleaning supplies and providing necessary training to use, maintain, and dispose of these products.

Construction Period Mitigation

- Providing on-Airport storage areas for construction materials;
- Developing specific truck routing and/or staging plans for implementation by the various contractors;
- Encouraging construction companies to provide off-Airport parking for their employees and to provide shuttle services from these locations (shuttles are required to use the Coughlin Bypass road to access the Airport);
- Requiring all construction vehicle/equipment to follow anti-idling procedures and all construction managers to provide associated training;
- Requiring the use of low- or zero-emissions equipment, where practicable;
- Requiring the retrofitting of appropriate diesel construction equipment with diesel oxidation catalyst and/or particulate filters;
- Requiring contractors to use Ultra Low Sulfur Diesel Fuel (ULSD);
- Deploying air quality and fugitive dust management best practices, such as reducing exposed erodible surface areas through appropriate materials and equipment staging, covering exposed surface areas with pavement or vegetation in an expeditious manner, and stabilizing soil with cover or periodic watering;
- Requiring trucks to access the Project sites by Route 1A, Interstate 90, Coughlin Bypass road, and the main Airport roadway only or other routes in compliance with transportation safety requirements;
- Prohibiting trucks from using local streets;
- Putting into place an Erosion and Sedimentation Control Program, in compliance with the Stormwater Pollution Prevention Plan, to protect water quality and to minimize construction phase impacts to Boston Harbor; and,
- Deploying spill prevention measures and sedimentation controls throughout the construction phases to prevent pollution from construction equipment and erosion.

Conclusion

Based on a review of the FEIR and comment letters, and consultation with State Agencies, I have determined that the FEIR adequately and properly complies with MEPA and its implementing regulations. The project may proceed to permitting.

January 30, 2020
Date

K. Theoharides
Kathleen A. Theoharides

Comments received:

01/23/2020	Conservation Law Foundation (CLF)
01/23/2020	Metropolitan Area Planning Council (MAPC)

KAT/ACC/acc

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B. Comment Letters and Responses to Comments

The following state agencies and organizations provided comments on the *2020/2021 Environmental Data Report*. Following these comment letters, Massport has provided responses to comment raised.

1. Massachusetts Department of Energy Resources; Paul F. Ormond B-3
2. Massport Community Advisory Committee; Aaron Toffler B-9
3. Air, Inc B-13
4. Conservation Law Foundation; Staci Rubin B-31
5. Friends of the Mary Ellen Welch Greenway; Karen Maddelana B-41
6. Responses to Comments B-45

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1. Massachusetts Department of Energy Resources; Paul F. Ormond

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COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF
ENERGY AND ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENERGY RESOURCES
100 CAMBRIDGE ST., SUITE 1020
BOSTON, MA 02114
Telephone: 617-626-7300
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Maura Healey
Governor

Kim Driscoll
Lt. Governor

Rebecca Tepper
Secretary

Patrick Woodcock
Commissioner

31 January 2023

Rebecca Tepper, Secretary
Executive Office of Energy & Environmental Affairs
100 Cambridge Street
Boston, Massachusetts 02114
Attn: MEPA Unit

RE: 2020/2021 Environmental Data Report, Boston Logan International Airport, Boston EEA #3247

cc: Maggie McCarey, Director of Energy Efficiency, Department of Energy Resource
Patrick Woodcock, Commissioner, Department of Energy Resources

Dear Secretary Tepper:

We've reviewed the Environmental Data Report (EDR) for 2020/2021 (published November 2022) for Boston Logan International Airport. EDRs are produced annually to identify environmental impacts based on measured passenger activity and operations. EDRs complement Environmental Status and Planning Reports (ESPRs), filed periodically, which provide both a data lookback, like an EDR, and a planning perspective looking forward.

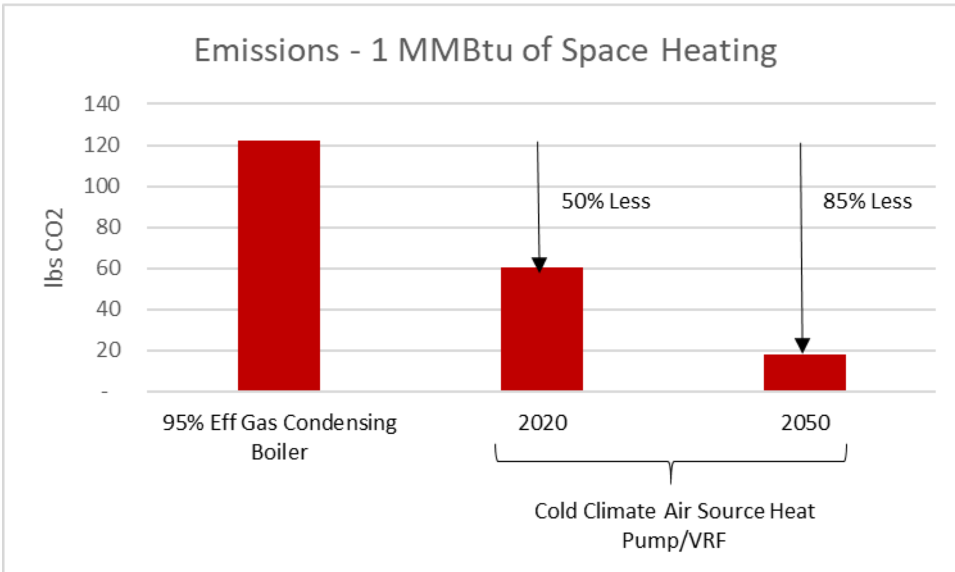
The objective of this review is to highlight strategies which reduce building emissions. Based on our review of the EDR, our recommendations are as follows:

Electrification

We recommend new construction and renovations use 100% efficient electric space and water heating. Efficient electrification entails the swapping of fossil fuels (natural gas, oil, propane) and fossil-fuel generated heat energy from the combined heat and power plant (CHP) with cold-climate rated air source heat pumps.

Electrification of space and water heating is a key mitigation strategy with significant short- and long-term implications on GHG emissions. Massachusetts grid emissions rates continue to decline with the implementation of clean energy policies that increase renewable electricity sources. The implication is that efficient electric space and water heating with cold climate air source heat pump equipment has lower emissions than other fossil-fuel based heating options, including best-in-class (95% efficient) condensing natural gas equipment and fossil-fuel generated combined heat and power (CHP).

For example, efficient electric space heating has approximately **50% lower emissions** in Massachusetts than condensing natural gas heating. By 2050, efficient electric heating is expected to have approximately **85% lower emissions** in Massachusetts than condensing natural gas heating. See illustration below.



Building Energy and Emissions Tracking

We are pleased to see that, in response to DOER's recommendation, these reports are continuing to track the following:

- GHG emissions in buildings, normalized by square foot (lbs CO2/sf-yr), and
- Energy use in buildings, normalized by square foot (kBtu/sf-yr)

The addition of these metrics will help provide important insights into the performance of Logan's buildings and help plan for the future.

We note, however, that the energy and emissions reported appear to take into effect on-site renewable energy production. We recommend that building energy and emissions use be tracked with and without effect of on-site renewable energy production to assess building efficiency measures themselves.

Estimating Building Emissions in Context of CHP

Estimating building emissions from buildings which use only utility provided electric and gas is relatively straightforward. However, we understand that, in addition to utility provided electric and gas, Logan also uses central plant combined heat and power (CHP) to heat, cool, and power buildings. When CHP is used, the building emissions picture is more complex.

To assess this, EDRs and ESPRs should also report the following:

- Space and water heating end use consumption, estimated and broken down by heating which is provided by central plant steam versus heating provided by fossil-fuel fired (or other) equipment;
- Space cooling end use consumption, estimated and broken down by cooling from central plant produced chilled water versus cooling provided by other non-CHP means;
- Estimated CHP heating, power, and cooling production efficiency

Once the above is estimated, the emissions of building space heating, space cooling, and service water heating can then be estimated. This analysis should be done using electric grid emissions of 633 lbs/MWhr (for year 2022) and 200 lbs/MWhr (for year 2050) to provide a picture of current and future emissions footprints.

New Construction, Additions, Alterations, and Change of Use

For new buildings, new building additions, and building which undergo alterations and/or change of use, we recommend the following:

- Prioritize building design and construction practices that result in low heating and cooling thermal energy demand intensity (heating and cooling "TEDI") with:
  - Built-up, framed, insulated walls with continuous insulation;
  - Thermally-broken windows and other components to eliminate thermal bridges;
  - Minimizing glass curtain wall assemblies and excessive windows;
  - Low air-infiltration, confirmed with in-building air-infiltration testing;
  - High levels of energy recovery;
  - Management of solar heat gains;
- If new or renovated residential or hotel space is planned, pursue Passivehouse (ether PHIUS or PHI certifications.)
- Use air source heat pump space and water heating.
- Avoid use of natural gas CHP and on-site gas combustion for space and water heating.
- Set aside as much rooftop space for solar as possible, including for projects in which solar may not be built as part of initial project.

- Prepare for ubiquitous electric vehicles with as much EV and EV ready parking spaces

Sincerely,

Paul F. Ormond, P.E.
Energy Efficiency Engineer
Massachusetts Department of Energy Resources

2. Massport Community Advisory Committee; Aaron Toffler

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Massport Community Advisory Committee
P.O. Box 470614
Brookline, MA 02447

January 23, 2023

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

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

Dear Secretary Card and Ms. Hughes,

Please accept this comment letter from the Massachusetts Port Authority Community Advisory Committee (MCAC) on the Boston Logan International Airport 2020/2021 Environmental Data Report – EEA #3247 (EDR) submitted on November 23, 2022. The MCAC is a legislatively created (See 2013 Mass. Acts Ch. 46, §§ 55, 82, as amended) committee comprised of representatives from thirty-five communities impacted by Massport's operations. Our statutory purpose is to provide oversight to Massport in order to minimize and mitigate the impacts that Massport has on our member communities. A representative from the MCAC attended the public consultation session on December 15, 2022, and we submit these comments based on the information presented at that hearing as well as the document referenced above.

Massport's unique MEPA reporting requirements are designed to give the public information about its historical activity levels and to project future trends/usage to enable Massport to meet the demand for air travel and to plan for, and mitigate, impacts on the public. It is clear from the great deal of information presented in the 2020/2021 EDR that Massport devotes significant resources to collecting operational data and forecasting future growth. However, in reviewing the growth forecasts for the past several years, it is difficult to understand the methodology used to produce the growth forecasts. What is clear is that the estimates for passenger levels have been grossly underestimated for the past decade. In the 2011 ESPR, Massport estimated an annual growth rate in passengers of 1.7% annually through 2030, despite averaging much higher annual growth rates in most years prior. That would have meant reaching 39.8 million passengers in 2030. This estimate was made even though the same ESPR reported an increase in passengers from 2010 to 2011 of 5.4% (from 27.4 million to 28.9 million). In reality, Logan served almost 42.5 million passengers in 2019, eclipsing by about 10% their own projections for 2030 (still 11 years in the future).

We are not the first organization to point out this discrepancy and to request more detailed information on how the forecasting is done. In the Certificate of the Secretary of Energy and Environmental Affairs on the 2018/2019 Logan Airport Environmental Data Report (March 19, 2021), the Secretary said that "the next EDR should describe the methodology for the forthcoming future forecast which should be provided in the 2022 ESPR." The MCAC would

Massport Community Advisory Committee
P.O. Box 470614
Brookline, MA 02447

repeat this request to understand more fully how much growth is expected at the airport in the future and what mitigation will be necessary to protect our member communities.

Forecasting passenger growth is not the only area where more transparency and more robust information sharing would be helpful. The EDR discusses efforts to evaluate new Logan Express sites without going into detail about what factors are considered or how each line of the service is currently performing. As ground access and increasing the share of HOV users to the airport are important issues, more information would allow the MCAC to partner with Massport and make recommendations for minimizing impact to our communities, particularly those that are near to the airport itself. More detailed information on parking usage and how rates are set would serve the same purpose.

Noise abatement and pollution prevention are two other areas where progress could be made with more information and dialogue to support partnership. The MCAC is aware that the Federal Aviation Administration is currently undertaking a review of their noise policy. Massport collects a great deal of information from its noise monitoring system which could be useful in supporting our participation in this effort. Sharing this information with our members would assist us in determining the optimal placement of these monitors as well as evaluating the data that they produce. To fully support the research efforts of local universities in air quality, access to detailed monitoring data of all emissions sources under Massport's control is also critical. We look forward to working with Massport to ensure that the public has access to this information.

Thank you for considering these comments. If you have any questions or concerns, please feel free to contact Aaron Toffler at atoffler@massportcac.org, or at (617) 906-8853.

Thank you.

Aaron Toffler
Executive Director, Massport Community Advisory Committee

cc: Stewart Dalzell
Brad Washburn
Thomas Butler

3. Air, Inc

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2020 / 2021 EDR NOTES

Airport Impact Relief

January 23, 2023

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

Re: Logan Airport 2020 / 2021 Environmental Data Report (EDR) EEA# 3247

Dear Secretary Card,
AIR, Inc. is a volunteer-led 5013C established in 1981, by East Boston airport activists of the 1960’s and 1970’s. Through three generations, we have organized meetings, analyzed reports, conducted community education and engagement and prepared community comments to present the perspectives of residents impacted by Logan airport’s adverse environmental impacts. We serve environmental justice (EJ) communities in East Boston, Chelsea, Winthrop, and Revere, but collaborate and support communities across the metropolitan area.

Introduction

Locating Logan in Boston’s urban core was a mistake. Had we known the trajectory of traffic, noise, and exhaust, we would not have planned an airport in the middle of Boston’s urban core, or destroyed three harbor islands, 2,000 acres of harbor, 2 neighborhoods, and an Olmsted Park to grow it. But the 1950’s was a time of rapid social and racial segregation; dominant planning theory held that urban neighborhoods were blighted, dangerous and expendable. So despite community opposition, the state pushed Logan plans forward.

Today, we have no excuses. Logan has choked our region in traffic, choked our families, and spread dangerous noise across the region. Yet despite these known impacts and the consequences they have on human health in environmental justice communities surrounding Logan, our airport authority and state regulatory agencies continue to push Logan forward.

Massport’s Logan Airport Environmental Data Report for reporting years 2020 and 2021 follows previous EDR’s and Environmental Status and Planning Reports (ESPR’s) in documenting Logan Airport activity levels and environmental impacts for Massachusetts Environmental Policy Act (MEPA) compliance review. By reviewing these documents, MEPA considers airport activity forecasts, passenger and flight levels, cumulative impacts, and policy and mitigation responses as proposed by the Massachusetts Port Authority (Massport, the MPA, or the Authority), and determines whether Logan Airport, in its entirety, is compliant with Massachusetts' environmental protection laws. MEPA's analyses support the Executive Office of Energy and Environmental Affairs' (EOEEA, or EEA) determinations of compliance of Massport's project proposals and disclosures with the state's environmental laws.

For community stakeholders, MEPA project reviews represent an opportunity for meaningful involvement in state-level project environmental policy and compliance determinations for Logan Airport. AIR, Inc. has participated in the MEPA process through submission of detailed, data-driven and essential community perspectives since MEPA's inception.

The 2020 / 2021 EDR, like the previous seven iterations of the Logan Airport project disclosure series (EEA #3247), challenges MEPA analysts to distill a massive tangle of confounding facts, statistics, and imposing economic pontifications, and answer the question of whether Massport, the state's most powerful lobbyist and government authority, which manages Logan Airport, an economic engine which fuels a nearly $1 billion dollar annual transportation hub and provides countless jobs, including many high paying political patronage positions, and which is also inconveniently, the #1 polluter in the Commonwealth, is complying with state environmental regulations. In theory, MEPA analysts could acknowledge and prioritize environmental justice for the low income and minority communities which are adversely impacted by well documented and severe noise, traffic and air pollution impacts. MEPA could analyze Massport's filings themselves or refer to AIR, Inc. and other stakeholders comments to find any number of incongruities and adverse environmental trends. Despite the vast power imbalances, it is nevertheless MEPA's job and challenge to exercise its power to recognize unnecessary environmental damage, adverse impacts, and disparate outcomes. This is a challenge which MEPA has by all indications completely and consistently failed to meet.

It is however possible that MEPA analysts have written scathing critiques of Massport's project filings, and that EEA, led by politically appointed Secretaries have ignored them. The result however is the same: MEPA and EEA have never certified a Logan EIR, EDR or ESPR as non-compliant.

1. MEPA must release its project analyses to provide transparency

As seen in the example above, community stakeholders are not offered transparency in this review process. Stakeholders providing comment on Massport submissions receive only the final determination of a political appointee at EEA, but cannot see the state-funded professional environmental analyses underpinning them. This leaves open very serious concerns regarding the bases, factual grounding, and influencers at play in this critical environmental, public health, and social justice-bearing decision making. In fact, the spectacular continued failure of the state to impose any limitations on Massport's freewheeling growth ambitions for Logan provides community stakeholders with strong evidence that political influence unduly affects Logan airport environmental determinations.

In fact, in the only instance on record in which the state's regulatory tandem has imposed any requirement however modest on the MPA, we see a clear example of this political corruption. When Secretary of EEA Kathleen Theoharides required Massport to produce further mitigation subsequent to continued over-forecasted growth which was confirmed in the 2018 / 2019 EDR, Massport simply refused to comply, claiming financial hardship due to Covid. AIR, Inc. and community stakeholders were disheartened, but not necessarily surprised to see the Port Authority so brazenly slap the face of EEA and shrug off its supposed regulators. This instance exposes the true nature of our state's commitment to environmental justice. It was incumbent upon EEA to find the 2019 / 2019 EDR non-compliant. But it didn't. EEA walked away from their conditions and certified the 2018 / 2019 EDR as fully compliant with state law, which in Massport's failure to satisfy the conditions of the ESPR, it was not. Secretary Theoharides resigned shortly thereafter, only stating that she was leaving for a new professional career opportunity.

In October 2022, a second and more spectacular example occurred. AIR, Inc.had submitted comments on the Runway 27 Runway Safety Area Improvement Project Draft Environmental Impact Report (the DEIR, EEA #16433), providing in-depth analyses of the viability of zero environmental impact alternatives which had been dismissed by the Authority without quantitative analyses or proper documentation. We outlined the opportunity to avoid unnecessary destruction of the harbor, disruption of navigation channels, and stress on Belle Isle Marsh through feasible, environmentally beneficial project alternatives. We requested that EEA acknowledge these omissions, and require the Authority to resubmit the document with a proper alternatives analysis.

About a week after the DEIR was certified as compliant, MEPA wrote to AIR, Inc. stating that there was 'an issue', and the groups' comments -although submitted on time, had not been considered in the review. AIR, Inc. requested that EEA revoke, and reissue the certificate after proper review of public comment. MEPA declined, stating that they looked at our comments and determined that they would have had no impact on MEPA's scoping for the Final EIR. State law requires MEPA to accept and consider comment; EEA to consider environmental justice, involve EJ communities, and require EIR's to properly evaluate alternatives. In EEA #16433, the state has simply refused to perform these duties.

2. MEPA must reform its Logan Airport environmental disclosure documentation and review procedures. Specifically:
    a. Extended review periods of even 60 days are insufficient, especially if timed over the holidays. In fact, given the iterative nature of the reporting system uniquely catered to Logan Airport, comment review and response procedures should also be iterative and responsive to community stakeholders' needs. MEPA cannot expect community stakeholders to wait years for Massport to update forecasts, or satisfy conditions of EEA certifications. AIR, Inc. has repeatedly requested that a rolling review process be developed
    b. AIR, Inc. has repeatedly commented that early public input in selection of project design alternatives and document scoping compliance is necessary to avoid

> submission of insufficient filings which handcuff reviewers and MEPA with inaccurate and omitted data. We have repeatedly requested that a Special Review Procedure be crafted to address Massport's Logan submissions. We renew this request today

Longstanding frustration with lack of accountability, transparency and failure to address adverse environmental and health impacts has now become acceptance that the state's promise of environmental equity in Massachusetts is hollow, and one which none of the responsible agencies has any intention of keeping. AIR, Inc. now believes that the MEPA system in place for Logan project reviews is in need of reform.

AIR, Inc. has respectfully played our part in Massachusetts' environmental review process, investing hundreds of volunteer hours shaping public comment in efforts to realize our community's environmental justice goals. We participated in MEPA's recent regulatory review process -a process which included twice as many Massport staff and consultants as community stakeholders, with representatives of Stantec, Harris Miller Miller & Hanson (HMMH), the American Council of Engineering Companies of MA, Vanasse Hangen Brustlin (VHB, the consultant which has written the past half dozen of Massport's disclosure documents), 2 representatives of NAIOP (of which Massport is a board member), and Wimbledon Bond Dickinson weighing in on the effectiveness of the MEPA process. The time commitment, slow pace, and lack of applicability to the specialized Logan reporting system forced AIR, Inc. to step away from this process. We objected on many occasions to the lack of relevance of the discussions to our topics and were assured by MEPA that airport issues would be addressed later. We have had no further contact from MEPA.

Further Comments

With the EDR's release the week before Thanksgiving, and the extended comment period ending on 1/23/2023, just three weeks after the holidays, AIR, Inc. has not had sufficient time to prepare complete comments. There are however certain underlying factors or themes we wish to convey at the top:

- The Massachusetts Port Authority was created with too much power and not enough direction
- Massachusetts' environmental laws have been created with too many promises and not enough power
- The state's commitment to environmental justice and environmental policy is corrupted by politics

The problems community stakeholders face in attaining meaningful involvement in decision making on Logan Airport project filings stem largely from combinations of these factors.

Below are the comments we have prepared in the few weeks remaining after the holidays:

3. MEPA, EEA and Massport inaction is inexcusable. AIR, Inc. and many other community stakeholders have participated in MEPA reviews, amassing many dozens of suggestions and requests. These comments are answered without engagement; smugly acknowledged, assigned a topical reference numbers, then dumped into what is essentially a mass grave -a matrix table which provides statements and quotes of text either from the filings or regulations, that serve as blank retorts to thoughtful comments.

   We ask that EEA finally address each of our past comments from the 2015, 2016, and 2018 / 2019 EDRs, the Terminal E Modernization Project, the Logan Parking Project, and the 2017 ESPR

4. MEPA, and EEA must require that the Authority limit the length of all environmental compliance documents

At 1162 pages, the length of the 2020 / 2021 EDR is a massive obstacle for citizen participation. The length of this document is unnecessary. For example, the precursor to Logan's EDR and ESPR series, the 1979 Draft General Environmental Impact Report, provided insights into Logan's planning, impacts, and mitigation, in just 218 pages. The fact that Massport's annual disclosure documents have reached over 1,000 pages each year since the 2015 EDR is evidence of heinous indifference to East Boston's EJ challenges.

Flesch Reading Ease

Score	Grade	Avg. Words Per Sentence	Syllables Per 100 words
90 - 100	5	8	123
80 - 90	6	11	131
70 - 80	7	14	139
60 - 70	8 - 9	17	147
50 - 60	10 - 12	21	155
30 - 50	College	25	167
0 - 30	College Grad	29	192

CONTENTWRITERS.COM

Flesch Reading Ease Guide

5. MEPA and EEA must require that Massport's MEPA submissions are succinct and readable

AIR, Inc. used the Online-Utility.org's Readability Calculator to test the readability of the EDR's introduction and Executive Summary. The utility reported a Flesch Reading Ease Score of 25.14, and indicated that a reader would need 16.16 years of formal education (per the Gunning Fox index) in order to easily understand the text on the first reading.

6. MEPA and EEA must require the Authority to calculate and report the socialized costs of Logan Airport operations

While the EDR mentions the word economy, or it's derivative words 51 times in the document's Executive Summary, 38 times in the Activity Levels section, 22 times in the Airport Planning section, and 64 times in the Regional Planning section, nowhere does the document provide economic data on the cost of lost productivity due to airport related traffic, the cost of lost wages due to sick time, or the cost of human life and suffering caused by illness. The message sent by these 185 economic references is that *Logan is an economic engine with which our state cannot afford to interfere*.

It is important to recognize that the implied reverse correlation -that Logan is in some way responsible for the strength of the economy is not supported by data. The economy might just as well be even stronger if growth and regional traffic and other environmental impacts were spread more evenly across the New England region in areas in which congestion's were less prevalent and mitigation would be far less costly. Rather than consuming the time and energy of EDR reviewers with descriptions of the biopharma industry, Massport should report the environmental impacts of their outfit in their MEPA filings.

The plain fact is that airports are not the economic engines of their regions, nor is proximity to airports in any way driving economic success. What has been proven is that proximity to airports to drives diseases such as childhood asthma, cancer, COPD, and heart disease.

More false economic narratives propose that multiplier effects cause the economic benefits of aviation to be accelerated through recirculation of money in the local economy after initially being spent by Airport tenants and their customers. This narrative carelessly fails to account for the money that leaves our economy as local dollars are spent on travel by New England residents at the Manny destinations to which Logan has service. The statewide economic impact assessment irresponsibly doesn't calculate the net impact. It only looks at the inputs. And MEPA and EEA are apparently uninterested.

7. MEPA and EEA must require Massport to develop a schedule of proactive policy and mitigation responses to future impact levels.

Massport bases it's mitigation planning on impact modeling based on passenger volume forecasts. When these forecasts are too low, impacts are under projected and actual passenger and flight levels rise. Impacts rise in direct correlation, but mitigation and environmental policy lag behind. Previous forecasting errors have
Resulted in a 10 million passenger mitigation lag.

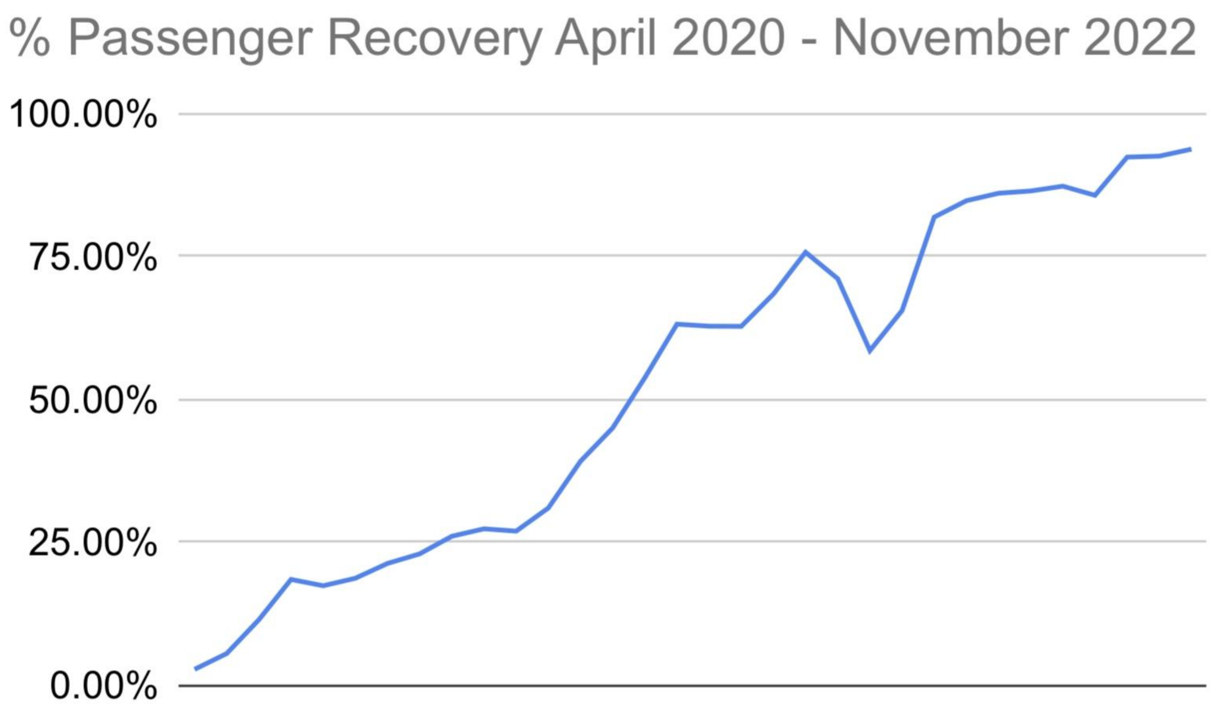
A pre-negotiated mitigation approach which establishes appropriate policy and programming responses to increasing levels of impact across the major impact centers of noise, air pollution, and traffic can be established to trigger advancing responses as attainment of or approach toward progressive passenger volumes, flight levels, and traffic volumes are achieved. This solution eliminates the possibility of disagreement over the accuracy of forecasts, and ensures that EJ populations surrounding Logan are not burdened by unmitigated pollution, but instead that environmental justice burdens are mitigated in real time.

More Inaccuracies

Of great importance in the present EDR is the urgency or lack thereof with which the Authority is addressing previous mitigation backlogs, as impacts -especially ground access impacts of traffic and engine idling pollution are rising more sharply now than ever due to the effects of the Covid 19 pandemic.

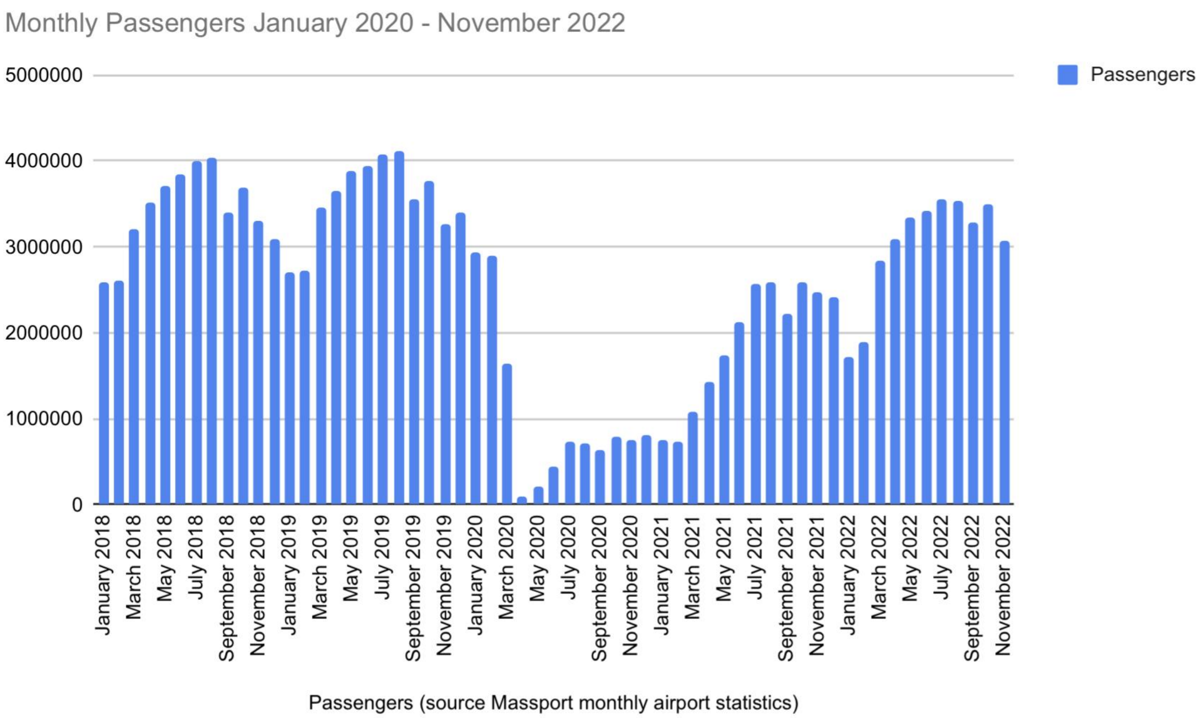
8. MEPA and EEA must require the Authority to provide comprehensive data.

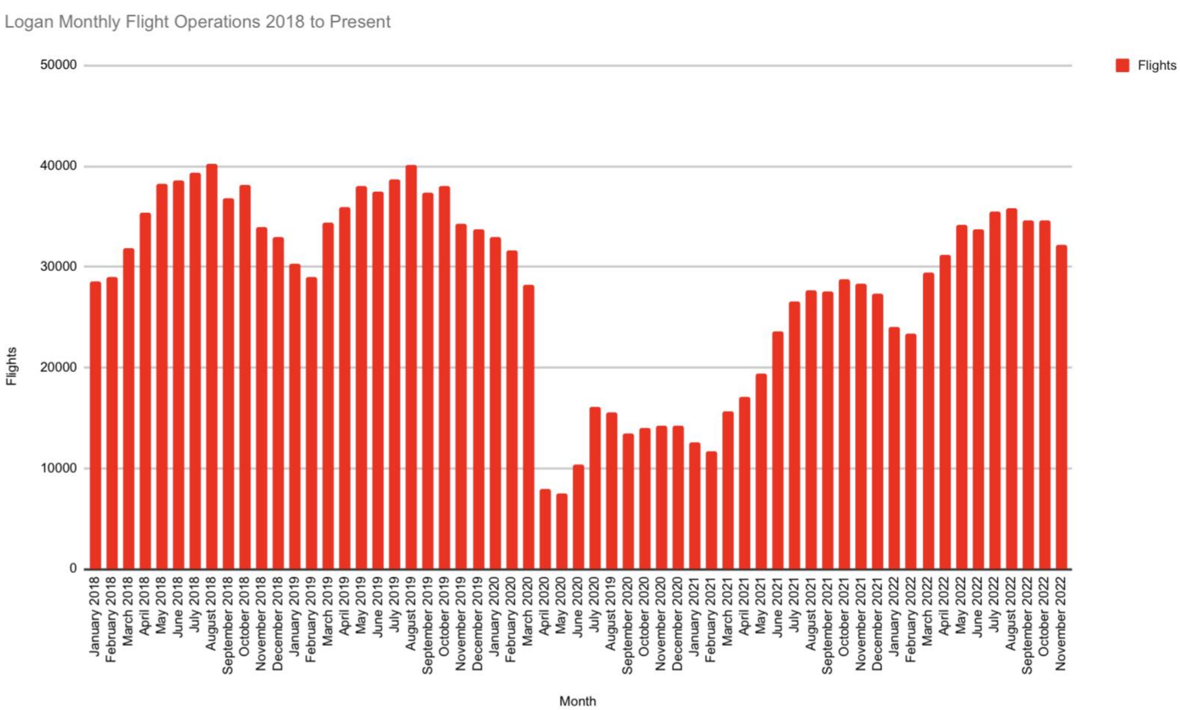
Massport has a long-standing habit of statistical shenanigans. For example, in the EDR, the Authority has elected to report 2020 and 2021 passenger activity levels as an annual percentage of 2019 peak volumes.



The use of annual reporting periods obscures the true nature and progress of Logan's recovery. For example, in the EDR, Massport reports that "*total flight operations and passenger levels recovered to approximately 62 percent and 53 percent, respectively, of 2019 levels*". In this report, released on the 3rd week of November, in 2022,at a time by which the Authority had already released multiple monthly airport statistics postings showing that passenger and flight volumes had risen above the 90% recovery level, the Authority surmised that these total flight and passenger levels showed "*a gradual return towards 2019 levels*". This misleads readers by creating the impression that over the reporting period, Logan operations had climbed halfway back to prior levels.

A more granular analysis of monthly Logan Airport statistics shows that in January of 2021, flight and passenger activity were at 38% and 27% of 2019 peak levels, and that; over the year, despite multiple virus variants and ongoing international travel bans, flights and passenger levels exceeded 83% and 76% (both were achieved during November 2021).





The 30% disparity between what Massport reported in its EDR and the degree of passenger volume recovery actually attained by the end of 2021 represents an passenger monthly density of not an airport serving 22 million passengers, but one instead which is serving 35.2 million.Therefore, through the EDR’s misleading statistics, Massport obscures a 13 million passenger annual recovery rate, and downplays the urgency with which and degree to which Massport must prepare mitigation strategies.

Elsewhere in the EDR, Massport repeats this tactic, providing an update covering up to the first 8 months of 2022 and suggesting that operations and passenger levels to that point were down 13% and 18% respectively. However, by July 2022, flights were at 92% of 2019 levels and passengers were at 87% for an aggregate of 90%. By the time of the EDR's release, in November 2022, both flights and passengers had reached 94% of pre-pandemic peak levels. AIR, Inc. predicted such a rapid recovery in our 2018 / 2019 EDR comments. Barring any global economic or pandemic related downturns Logan, is likely to eclipse its previous high monthly passenger volumesthe within the next 6 months.

In perhaps the most important example, while in 2019, Massport reported an average weekday daily traffic (AWDT) total of 143,189 vehicular trips per day to Logan, and a total of 42,522,411 passengers, producing a ratio of 0.003368 AWDT to annual passenger volume, in 2021, the Authority reported 90,185 AWDT and 22,678,499 passengers. The 2021 AWDT to annual passenger level ratio was therefore 0.00398. With monthly passenger volumes having returned to 83% of 2019 levels by the end of 2021 (an annualized rate of 35,293,601) we can calculate that Logan was attracting a monthly AWDT of 140,351 by the end of the year. Massport however leaves us with the impression that AWDT was at 90,185 in 2021, or just 63% of 2019. Furthermore, Massport has reported that passenger levels have returned to 94% of 2019 levels as of this November (2022). This, considering the 2021 AWDT to annual passenger volume ratio, allows us to calculate that airport vehicular traffic has already eclipsed 2019's all time high levels with a monthly AWDT of 158,952 in November. Mitigation planning which is based on actual passenger levels attained would eliminate the risk of these sort of errors.

Pollutant	Units	LDGV	LDGT
VOC	g/hr g/min	2.683 0.045	4.043 0.067
THC	g/hr g/min	3.163 0.053	4.838 0.081
CO	g/hr g/min	71.225 1.187	72.725 1.212
NOx	g/hr g/min	3.515 0.059	4.065 0.068

Idling emissions factors (Source EPA 2008)

9. MEPA and EEA must demand that Massport provide an accurate and detailed reporting of on-airport vehicle idling data, and a plan to control this avoidable form of pollution

The EDR provides emissions estimates for Parking / Curbside. In the example of carbon monoxide (CO), the Authority reported 4 kg/day for 2021. At this level, idling and parking vehicles at Logan airport would produce 0.1667 kg (or 166.7 gm) of CO per hour. Using the EPA idling emissions factors for CO emissions from gasoline powered light duty vehicles of 72 gm/hr, the data in the Report proposes that 2.3 vehicles would be idling at Logan at any given time. This is not realistic. AIR, Inc. observed idling behavior at Logan's terminal curbs, cell phone lots and professional lots and found an aggregate idling rate of 50% and an average idle time of 12.5 minutes. Applying our idling rate and duration factors to the 2021 EDR's reported average weekday daily traffic (AWDT) level of 90,185 vehicles, 45,092 vehicles idled at Logan for a total period of 9,300 hours per day. The EPA's 72 gm/hr emission factor places Logan's daily CO emission at over 636 kilograms (1491 lbs) per day, over 150 times the EDR estimate.

10. MEPA and EEA must require Massport to commence planning for aircraft emissions reduction programs at Logan by:
    - Initiating a groundbreaking tri-state regional airport master planning process
    - Developing an airport Emissions Rule
    - Making single engine taxiing mandatory
    - Development if a proposed electric aircraft airports plan
    - Developing a Beta testing plan for electric aircraft which assures that electric aircraft distribution will benefit EJ communities
    - Develop electric aircraft infrastructure and evaluate alternate technologies to generate power such as installation of microgrids and airfield solar farms
    - Immediately designing and fully funding a community air filtration program for classroom and residential applications

11. MEPA and EEA must require Massport to consider the costs and benefits of all viable ground access policy and mitigation alternatives, including use of an airport roadway fee, and all reasonable monetary and non-monetary pricing adjustments under Massport's control in a transparent manner within the EDR / ESPR series. MEPA and EEA must get serious about protecting public health by insisting that Massport consider eliminating Logan's 'free ride' policy

Massport's ground access strategy is failing badly. The 30 month self-prescribed period of inactivity in HOV program advancement is a generational environmental policy and transportation planning blunder. We note that in the noise section, Massport states that they accelerated a runway rehabilitation project to avoid operational disruptions, illustrating the fact the the Authority recognizes the opportunity to accelerate beneficial programs during the Covid pause.

While modern planners and community stakeholders around the world embrace all manner of innovation in mode shifts away from motorized modes as a means of improving local air quality, Massport has remained entrenched in its mid-twentieth century autocentric mindset. The Authority's long lists of HOV services, and recent much publicized goals set with Conservation Law Foundation merely pay lip service to environmental policy while the Authority indulges every possible form of single occupancy travel to Logan.

According to Massport's 2019 Air Traveler Survey:

- 21.2% of passengers at Logan arrived by way of Massport's most popular ground access program: their unofficial Free Ride traveler curbside pick-up and drop-off option
- 16.7% of airport passengers arrive in ride apps, taxis or limousines
- 20.8% of passengers arrive via passenger cars in Ride app, taxi, or limousines, but through the magic of CLF and Massport's low-standard formula, since these trips have at least one additional passenger, they are considered high occupancy trips
- 10.7% of Logan customers rent a vehicle, and
- 9.3% of travelers drive to Logan and rent parking
- 1.5% park off airport

Therefore, 78.7% of Logan travelers arrive via passenger car.

In the example of on-airport parking, Massport claims that pricing has been set to ensure that the cheapest on-airport option, parking at the economy garage (normally $29 but now inexplicably discounted to $25/day), is more expensive than Logan Express (LEX) (normally $11 but now discounted to $9/ride). As the table below indicates, this HOV cost benefit assertion is factually incorrect for the majority 17 out of 35, or 51% of traveler scenarios (shown in bold typeface).

Length of stay (days)	Cost Logan Express Parking	Cost: economy on Airport parking	Cost: Logan Express 1 rider plus parking	Cost: Logan Express 2 riders plus parking	Cost: Logan Express 3 riders plus parking	Cost: Logan Express 4 riders plus parking	Cost: Logan Express 5 riders plus parking
1	$7	$25	$25	$43	$61	$79	$97
2	$14	$50	**$32**	$50	$68	$86	$104
3	$21	$75	**$39**	**$47**	$75	$93	$111
4	$28	$100	**$46**	**$64**	$82	$100	$118
5	$35	$125	**$53**	**$71**	**$89**	$107	$125
6	$42	$150	**$60**	**$78**	**$96**	**$114**	**$132**
7	$49	$175	**$67**	**$85**	**$103**	**$121**	**$139**

For a single passenger driving and parking at an LEX facility at their daily parking rate of $7, this HOV mode is equal to or the more affordable choice. However, given that on-airport parking rates are fixed daily costs per vehicle, while Logan Express fares are $9 per trip, per individual, this cost advantage is not clear and consistent. The table above demonstrates that the current pricing strategy provides only regressive benefits. HOV mode monetary cost benefit is illustrated above by use of bold black typeface.

Other considerations play a role in traveler airport ground access mode decision making, including travel time, trip purpose, travel cost, parking fee, comfort, and convenience. From a travel time, comfort and convenience perspective, there can be little doubt that drive and park options carry significant benefits. Applying a $50 penalty to LEX services assuming a 20 - 30 minute increase in travel time, and a major downgrade in convenience and comfort, cost benefits of LEX (shown in dark red bold typeface) reduce to only 11 (31%) out of a possible 35 scenarios. For a two passenger group, cost benefit begins with a four day trip, for a three passenger group- on the 5th day, a four passenger group- on the seventh day, and for a party of five, there is no cost benefit. If Covid-driven HOV hesitancy adds another $50 penalty, bringing the total HOV trip mode convenient cost penalty up to $100, there is almost never any total cost benefit to use of LEX HOV airport travel mode, with a benefit showing up in just a single scenario (2.8%). This benefit is indicated by use of bright red bolded typeface. All said, given Massport's current ground access pricing strategies, there is almost no incentive to use Logan Express.

12. MEPA and EEA must specifically acknowledge the disparities of scale factoring into Massport's emissions reporting

The MPA has released fanciful announcements of its dreams to produce a Roadmap to Net Zero plan at some point in the future. This plan would redirect $1 billion of Massport's billion dollar per year budget toward a splashy, high-level, global corporate citizenship goal of reducing Logan's carbon footprint. This plan includes 30% - 40% use of offsets, to cut the sources of CO_2 which the MOA considers "under their control". However, the Authority has reported that aircraft exhaust emissions which they say are not under their control, comprise 95% of Logan emissions. Thus, the emissions over which Massport has sway are around 5% of a raging and ever-growing airport cumulative CO_2 impact.

13. MEPA and EEA must require Massport to take action immediately to reduce nighttime aircraft noise

Massport's forecasting of nighttime noise has been even less accurate than their passenger growth forecasting. With nighttime flights climbing a remarkable 16% over the previous reporting period, then totaling 17% of Logan operations, unspeakable disturbances of EH communities evening hours reached an unbelievable 195 operations per night (or a flight every 2 minutes on average). Current flight operations are near, at, or potentially even above 2019 peak levels. Therefore, this health-shattering adverse airport impact is now likely to have fully recovered from the pandemic. MEPA and EEA must demand that the Authority produce a plan to reduce Logan's nighttime noise footprint which is equal to their ambitions in reducing Logan's carbon impacts.

Pursuant to that goal, AIR, Inc. renews its demand (from multiple EDR / ESPR comments) that Massport update the Preferential Runway Advisory System (PRAS), providing target percentages for runway use to control noise impacts, including nighttime noise. We reiterate that updating PRAS was a condition of the FAA Record of Decision of 2002, and that while Massport has reported that the Logan CAC voted to abandon PRAS, MEPA must recognize that the FAA RoD created a legal obligation that PRAS be updated or replaced as part of Massport's Airport Improvement plan and did not offer Massport, or the Logan CAC authority to abandon PRAS without replacement. The RoD specifically states that PRAS shall remain in place until replaced or updated. This is the reason that Massport continues to report on PRAS; as a hedge against legal reprisal.

Given that MEPA and EEA are bound by law to ensure that all feasible alternatives to environmental damage be explored, these agencies are required to insist that Massport use PRAS to reduce noise, including nighttime noise.

14. MEPA and EEA must immediately demand that Massport commence an actual emissions measurement and reporting system

The EDR reports on 13 different modeling systems over the past 21 years. This equates to a change in method every 1.6 years. The result has been a nearly incomprehensible rollercoaster ride of reported emissions levels, confounding attempts to interpret and manage air pollution.

This should prompt MEPA and EEA to demand change as part of its powers to require that all feasible efforts be made to avoid environmental damage. Under this authority, MEPA and EEA can require Massport to provide a history of actual measured air quality (AQ) levels for all EPA criteria pollutants, and ultrafine particulate matter counts, as best as can be produced until a full and complete measurement and reporting system can be implemented, using a variety of qualified data sets produced in the past, by a variety of partners, and; to install a network of high grade AQ sensor devices across the region to collect subsequent readings of the same. When such a database of pollution levels is completed, data can be analyzed as needed, providing MEPA, EEA, and community stakeholders with clear comparisons.

15. MEPA and EEA must require Massport to substantiate any claimed improvement in air quality due to changes in the fleet (retirement of old, polluting aircraft) in quantitative terms

16. MEPA and EEA must either require Massport to provide narrative context describing the relative effects on impact levels for metrics they report, or prevent the Authority from wasting reviewers time with meaningless dialogues.

In one example, the Authority in two consecutive EDR's claims a forthcoming improvement in air quality which they say will be achieved due to changes in the fleet (retirement of old, polluting aircraft), but have not provided quantitative data on the anticipated effect. This is important, as use of 10% cleaner aircraft by 25% of aircraft would create a significant 2.5% benefit. But this one-time fleet improvement benefit would be outpaced by one year's worth of flight operations growth at previous 10 year rates. Without context, community stakeholder reviewers and MEPA analysts might be misled into assuming that pollution levels will be decreasing, when instead they are simply nust temporarily not increasing by as much for one year:

The EDR occupies dozens of pages entertaining busy readers -local low income families and state regulators alike -with irrelevant lists of facts and accomplishments explaining all the good things they do in the margins, or on the sidelines. Nobody is asking the Port Authority to participate in toy drives and such largess has no relevance to Airport environmental planning. Enough good deeds cannot be done to offset the premeditated destruction of community health. MEPA and EEA should require that Massport put forth a serious effort to analyze and improve environmental outcomes.

17. MEPA and EEA must stop approving incremental airport capacity-building projects

The EDR states "*Several projects aimed at providing on-Airport roadway congestion relief are ongoing and are expected to be complete by summer 2023. …Recent and ongoing terminal area projects are providing seamless post-security connectivity and flexibility among the terminals along with enhancements to passenger processing through consolidated security checking areas*."

MEPA has approved the illegal segmentation of airport expansion above AIR, Inc.'s objections for over a decade now. This needs to stop.

18. MEPA and EEA should require Massport to disclose Logan's maximum flight and passenger capacity and report each year on the percentage of attainment of that level

No airport has infinite capacity. Logan has systematically built additional capacity through airfield, terminal and roadway projects. Boston's roadway network appears to have reached its capacity in 2019, by which time we had been labeled the most congested city in the United States. Airfield capacity is another story. While Logan may not have reached its practical capacity yet, at some point it will. Whatever that capacity is, MEPA and community stakeholders deserve advanced warning. Overcapacity conditions create exponential congestion impacts. Myopic planning may serve the airlines' needs, but it spells disaster for the city.

Conclusion

Overall, the MEPA review process and Massport's and EEA's political gamesmanship within it spells disaster for the city.

4. Conservation Law Foundation; Staci Rubin

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conservation law foundation

For a thriving New England

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January 23, 2023

Via Electronic Mail and Online Portal

Secretary Rebecca Tepper
Executive Office of Energy and Environmental Affairs
Attention: Jennifer Hughes
100 Cambridge Street, Suite 900
Boston, MA 02114

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

Dear Secretary Tepper, Director Kim, and Jennifer Hughes:

On behalf of the Conservation Law Foundation (CLF) and its members,[1] we provide comments regarding Massachusetts Port Authority's (Massport) Boston Logan International Airport 2020/2021 Environmental Data Report (EDR). CLF has appreciated its ongoing communications with Massport on a variety of issues. Through these discussions, it is apparent that Massport and CLF share the goal of reducing the overall environmental, emissions, and traffic impacts of travel to and from Logan Airport and encouraging an increase in the number and percentage of airport passengers who get to and from the airport by high-occupancy vehicle (HOV) modes.

Preliminary Statement

The 2020/2021 EDR provides a historical review of environmental conditions for the given reporting years and describes Massport's progress on its environmental mitigation commitments. As noted in the EDR, flight activity and passenger volumes dropped significantly during the reporting period due to the COVID-19 pandemic,[2] but the most recent 2022 data indicate that travel patterns are currently on track to soon meet or even exceed 2019 peak numbers. It is therefore imperative that mitigation efforts remain a priority to reduce environmental and public health impacts.

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[1] CLF is a nonprofit, member-supported, regional environmental organization working to conserve natural resources, protect public health, and promote thriving communities for all in the New England region. CLF protects New England's environment for the benefit of all people. We use the law, science and the market to create solutions that preserve our natural resources, build healthy communities, and sustain a vibrant economy. We are working to cut pollution from our cars and trucks, create alternatives to driving, and push for more affordable and equitable transportation options across New England.

[2] EDR 2020/2021, page 1-1.

Given that growth is a primary driver of public health and environmental impact, and consequently will determine the scale of Massport's obligations and opportunities to avoid, minimize, and mitigate environmental and human harm, CLF recommends that the Secretary's Certificate provide further detail on methodology and reporting requirements, prioritize mitigation efforts as travel patterns rebound, specify transparent thresholds for deferred mitigation projects, and direct robust and ongoing community engagement. Despite decreased travel in recent years due to the pandemic, it is clear that activity is rapidly resuming, and mitigation for this new and increased travel is essential.

Communities near Logan Airport have long been disproportionately affected by air pollution. Public health studies document strong links between air pollution and COVID-19 health risk,[3] and indeed communities near Logan have also been disproportionately affected by COVID-19.[4] Given these risks, it remains critical that Massport continue its mitigation projects and provide clear thresholds for any deferrals, engage with residents and organizations from affected communities, and provide transparent and clear reporting of environmental impacts. While travel activity and operations have not yet fully returned to pre-pandemic levels, trends from the past two years show that travel is rapidly resuming and trending back up toward these levels.

Mitigation efforts therefore remain critical, and CLF encourages Massport to be more exacting in its activities and transparent in its decision-making. We applaud Massport for following through on several important commitments despite the ongoing uncertainty, and we offer the following comments regarding the 2020/2021 EDR.

Detailed Comments

CLF and Massport share and have worked collaboratively to achieve the goal of reducing overall environmental, emissions, and traffic impacts resulting from Logan Airport operations. CLF offers these comments regarding Massport's ongoing and planned initiatives to minimize and mitigate public health and environmental impacts as presented in the 2020/2021 EDR. We also reference the Executive Office of Energy and Environmental Affairs (EEA) certificate of the 2017 Environmental Status and Planning Report (ESPR) and the requests EEA posed to Massport in the certificate (ESPR Certificate). We note the importance of mitigation and a rigorous MEPA review process, which are even more urgent now as travel patterns increase with an easing of pandemic restrictions and years of delayed travel, and the ongoing need for robust community engagement and public information sharing regarding Massport activities.

A. Massport needs to ensure that mitigation efforts keep up with increasing rates of travel as pandemic restrictions ease and travel resumes.

[3] Wu, X., Nethery, R.C., Sabath, M.B., Braun, D. and Dominici, F., 2020. Air pollution and COVID-19 mortality in the United States: Strengths and limitations of an ecological regression analysis. Science Advances, 6(45), p.eabd4049.

[4] McDonald, Danny. "East Boston's COVID-19 positive test rate is over 11 percent, the highest of any Boston neighborhood by far." Boston Globe. August 27, 2020. Accessed January 20, 2023 at https://www.bostonglobe.com/2020/08/27/metro/east-boston-covid-positive-test-rate-that-tops-11-percent-by-far-highest-city/.

The 2020/2021 EDR reports that passenger levels had returned to 53 percent of 2019 levels by the end of 2021,[5] and operations had increased to 62 percent of 2019 levels.[6] It is somewhat misleading to consider these data only on an annual basis. The most recent data as published by Logan Airport for November 2022 indicate that the total number of passengers in that month was 3,060,571, which is 94 percent of the total passengers in November 2019.[7] This trend is consistent throughout 2022; the total passenger count in October[8] and September[9] of 2022 was 92.5 percent and 92 percent of travel in those months in 2019, respectively. In short, it is useful to examine the monthly changes as well as annual changes, and in doing so the numbers indicate a much more rapid return to pre-pandemic levels of travel than is stated in the EDR. Even when considering the 2020/2021 EDR reporting period, passenger numbers were at 71 percent of 2019 numbers at that time, and total airport flight operations numbers were at 80 percent of 2019 numbers, indicating a strong upward trend.[10]

Given the indication of a rapid return to "normal," Massport must urgently prioritize mitigation efforts to reduce and ideally avoid human and environmental harms. The Secretary previously recommended that Massport work to fund the provision of HEPA room air purifier filters in key community locations such as schools, and to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts.[11] We urge Massport to continue working with community-based organizations that have long been involved in this work, such as AIR, Inc., GreenRoots, Inc., and Mothers Out Front, and to support the dissemination of air filtration.

We also note the reference in the 2020/2021 EDR to recent and ongoing research studies including the current work of Boston University and Tufts University on Ultrafine Particulates (UFPs). The 2020/2021 EDR should provide a more detailed update on the study and how findings may relate to Massport activities. CLF underscores the importance of acting in accordance with the findings of this and other scientific research, and also of engaging with and responding to the nearby communities who experience the poor public health outcomes. We are pleased to see the ongoing efforts and partnership regarding treatment for asthma and other respiratory impacts, but underscore that prevention is far preferable to treatment and should be prioritized. The use of HEPA filters and other mitigation techniques should be a key goal to ensure that the negative impacts of airport activity are prevented and offset.

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[5] Logan Airport 2020/2021 EDR Overview, Accessed January 20, 2023 at https://www.massport.com/media/vgphi3os/logan-edr-overview_12-15-22-final.pdf, page 1.
[6] EDR 2020/2021, page 1-8.
[7] Boston Logan International Airport, Monthly Airport Statistics, November 2022, Accessed January 20, 2023 at https://www.massport.com/media/pjlpu1bv/1122-avstats-airport-traffic-summary.pdf.
[8] Boston Logan International Airport, Monthly Airport Statistics, October 2022, Accessed January 20, 2023 at https://www.massport.com/media/qa3di0ev/1022-avstats-airport-traffic-summary.pdf.
[9] Boston Logan International Airport, Monthly Airport Statistics, September 2022, Accessed January 20, 2023 at https://www.massport.com/media/jl3liaeg/0922-avstats-airport-traffic-summary.pdf.
[10] Boston Logan International Airport, Monthly Airport Statistics, December 2021, Accessed January 20, 2023 at https://www.massport.com/media/leufvaab/1221-avstats-airport-traffic-summary.pdf and 2019 numbers at https://www.massport.com/media/3927/1219-avstats-airport-traffic-summary.pdf.
[11] Certificate of the Secretary of Energy and Environmental Affairs on the 2017 Logan Airport Environmental Status and Planning Report, MEPA Certificate 3247, page 4 (Nov. 25, 2019).

B. We recommend that Massport continue to clarify and refine its process for estimating growth rates and for other calculations and provide additional detail for the forecast methodology.

We commend the inclusion of the section outlining the 2022 ESPR Forecast Methodology in the current EDR and encourage even further detail and transparency in this section of the 2020/2021 EDR, in the 2022 ESPR, and in future reporting. CLF has identified in the past that Massport's characterizations of environmental impact were based on an inadequate forecasting process for both operations and passenger activity. As previously noted, the forecasting process in the 2017 ESPR was inconsistently represented, historically inaccurate, and did not match the qualitative descriptions of key growth drivers within the ESPR. Further, as stated earlier, it is instructive to consider multiple timeframes when analyzing this data; short-term monthly reporting paints a much different picture of the recovery of travel patterns than when looking at the data over an annual timeframe. Given the importance of prevention and mitigation for its work, Massport's process for measuring impacts and devising appropriate mitigation activities must be sufficiently robust to meet situational uncertainties.

Measuring impact (e.g., noise, air quality, vehicle miles traveled (VMT)) on inaccurate activity forecasts is problematic. We recommend that Massport provide a list of all measured impacts, how said impacts are methodologically related to the activity levels presented in the ESPR forecast, and how current and forward-looking data can be used instead in both the MEPA reporting process, and in other public engagement forums. We encourage Massport to work with community stakeholders to create a mitigation planning system which is based on actual passenger, flight, and daily traffic volumes.

To that end, Massport should more thoroughly document public health impacts. Massport should provide a more detailed update on the Tufts and Boston University Ultrafine Particulate (UFP) study and associated findings. EEA notes that the EDR should "provide an update on the status and finding of UFP research being performed by Tufts University and Boston University regarding the identification of airport-specific related UFPs in an urban environment."[12] The 2020/2021 EDR notes Massport's cooperation and data sharing in regard to the study but does not provide additional details on study findings or relevance to Massport activities. Further, CLF made this request in regard to the 2018/2019 EDR as well, so it is concerning to see a continued lack of detailed updates on this important work.

C. CLF seeks additional details in the EDR regarding ground transportation to conform with the Massport-CLF agreement.

The 2020/2021 EDR notes that HOV ridership dropped in the reporting years due to decreased travel overall and because of reluctance to use HOV modes of travel due to the ongoing COVID-19 pandemic.[13] Now that overall passenger numbers are increasing at Logan, this reluctance may be subsiding. Ideally HOV trips would keep pace with this trend. Per the 2017 Massport-CLF agreement, Massport needed to have achieved at least 35.5 HOV mode share by December 31,

[12] 2017 ESPR Certificate, p. 18.
[13] EDR 2020/2021, page 5-1.

2022 and at least 40 percent by December 31, 2027.[14] Massport may have met this goal; the EDR states that according to the most recent reporting, conducted in 2019, air passenger ground access mode share is "40.4 percent for HOV and shared-ride modes, exceeding both near-term and longer-term goals."[15]

It is not clear, however, how these numbers may have changed due to the pandemic. HOV ridership decreased severely along with all travel, and while it does appear to be rebounding, it is not clear in the 2020/2021 EDR whether the 35.5 percent goal for 2022 has truly been met. There was only a 12 percent increase from 2020 to 2021 reported in the EDR, when considering all HOV vehicles that the EDR reports on (MBTA Blue and Silver Lines, the Logan Express Bus, the MBTA Ferry, and private water taxis; this excludes RideApp trips because it is not clear what portion of these rides are considered HOV).[16] Additionally, when comparing the HOV passenger numbers to overall airport passengers, total HOV passengers only constituted 11 percent of all airport passengers in 2021.[17] Given that some HOV-related mitigation measures have been deferred (see Table 1), it's possible that HOV mode share has now been reduced below the goal percentage.

While Massport states that they are on track to meet the goals of the Massport-CLF agreement, it is difficult to confirm this based on the information in the EDR. Massport must prioritize mitigation efforts that support increasing HOV mode share and must be transparent about this reporting in the forthcoming 2022 ESPR.

D. <u>There should be transparent thresholds for deferred mitigation projects.</u>

We are pleased to see that several mitigation projects that were previously on hold are moving forward or have been completed, including plans to procure eight additional MBTA Silver Line buses, and incentives for Logan Express riders such as security line priority status. Notwithstanding, there are still several initiatives that remain deferred without clear guidelines or goals for when they will resume. We list these in the table below. We recommend that Massport develop transparent thresholds of the appropriate metric (e.g., VMT, operations, passenger activity, etc.) for when Massport will return to the implementation of these projects, or at least clarify decision-making processes for returning to these mitigation measures. The 2020/2021 EDR notes that these projects will need to be re-evaluated but the decision-making processes that indicate when and under what conditions Massport will conduct this re-evaluation in unclear. In some cases, Massport notes that they will begin the project once passenger activities reach 2019 levels, and it is evident based on the 2022 Airport Statistics that current activities may already or very soon will match 2019 activities. CLF recommends that the Secretary's 2020/21 Certificate establish thresholds for Massport to recommence deferred mitigation projects.

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[14] Massport-CLF Agreement (May 18, 2017).
[15] EDR 2020/2021, page 3-8.
[16] EDR 2020/2021, page 5-11.
[17] Calculated based on Boston Logan December 2021 Airport Statistics as accessed January 20, 2023 at https://www.massport.com/media/leufvaab/1221-avstats-airport-traffic-summary.pdf.

Table 1 – Key Deferred Mitigation Projects

Project Category	Mitigation Activity	Environmental Impact	2020/2021 EDR page reference
Airport Ground Transportation and Parking Projects/Planning Concepts	Logan Airport Parking Project (additional 5,000 spaces)	Reduced VMT	1-17
Suburban Logan Express Enhancement	Add about 1,000 additional spaces to the Framingham garage.	Added HOV share, reduced VMT.	1-21
Suburban Logan Express Enhancement	Evaluate new Logan Express suburban locations, with a plan to open at least one new site.	Added HOV share, reduced VMT.	3-7
Airport Ground Transportation and Parking Projects/Planning Concepts	Terminal E Modernization (incorporates former West Concourse Project) - Blue Line Pedestrian Connection	Added HOV share through pedestrian connectivity.	3-16 / 9-42
Urban Logan Express Service	Massport's plan to operate a new urban Logan Express location between North Station and Logan Airport is currently on-hold (although Massport procured buses for this service in 2020).	Added HOV share, reduced VMT.	9-14
Other	Several options were identified to reduce on-Airport congestion and improve on-Airport ground access efficiency. Initial options included dedicated HOV bus lanes, the creation of an intermodal transportation center with bus service to terminals, the construction of an Automated People Mover (APM), or some combination of these improvements. These and other options are currently on hold and will be revisited once passenger levels recover closer to 2019 levels.	Added HOV share through intermodal transit, infrastructure improvements, reduced VMT	9-17

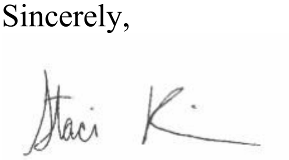
E. <u>Massport must continue to engage with affected communities to discuss mitigation opportunities.</u>

The 2020/2021 EDR reports on mitigation commitments and environmental impacts within the reporting period. In the EDR review process, Massport produces these documents internally, and then releases them to the public for comment and input after they are already complete. Given the rapid changes that have followed from the pandemic, an annual public review process where public input is only provided after Massport releases a document is insufficient for proper mitigation planning, especially as Massport is making decisions about mitigation projects and operations as the pandemic situation shifts. Instead, Massport should work with organizations and members from the most affected communities prior to the release of the next iteration of the report. This will allow Massport to conduct more thoughtful planning as operations and impacts shift. It would also significantly improve a reporting process that is opaque and very technical by making this information more accessible.

State laws and policies require enhanced engagement with residents of environmental justice populations.[18] We note Massport's acknowledgement of the updated MEPA protocols regarding public involvement, environmental justice populations, and climate change adaptation and resiliency.[19] To go even further and best address goals of equitable and efficient public involvement, CLF encourages Massport to hold community meetings, outside of MEPA processes and after MEPA deadlines expire, to discuss ways for Massport to be a great neighbor and best implement mitigation measures associated with its environmental impacts, which are especially important as we live through the next phase of the COVID-19 pandemic.

CLF is happy to provide additional information and assistance as may be required. You may contact me with questions at SRubin@clf.org.

Sincerely,



Staci Rubin
Vice President, Environmental Justice
Conservation Law Foundation

[18] An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy, St. 2021, c. 8, § 60; Exec. Order 552 (2014); 301 CMR 11.00 et seq., Executive Office of Energy and Environmental Affairs Environmental Justice Policy 2021.
[19] EDR 2020/2021, page 1-7.

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5. Friends of the Mary Ellen Welch Greenway; Karen Maddelana

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Friends of the Mary Ellen Welch Greenway
PO Box 74
East Boston, MA 02128

December 16th, 2022

Dear Secretary Theoharides,

The Friends of the Mary Ellen Welch Greenway would like to comment on the Boston Logan International Airport, 2020/2021 Environmental Data Report (EEA #3247).

First and foremost, we appreciate the extension of the deadline for comments to January 23, 2023. The previous deadline on January 6th, right after the holidays, would have been rushed.

We would like to see more detailed information about the impact methodology in regards to the impact along the Mary Ellen Welch Greenway. For example, what are the expected air quality metrics along the Greenway?

Additionally, as the airport continues to grow, we would like to see it address an increase in traffic on 1A. We are highly interested in the locations with the most traffic volume along the Greenway, particularly on the Martin A. Coughlin Bypass Road.

Finally we would like to echo's AIR Inc.'s note about adding key updates to the ESPR 2017 iteration of Logan's unique MEPA review process:

1. The relevant scientific research on health impacts of aviation noise and pollution
2. Additional strategies to keep mitigation on pace with growth
3. Strategies for the most effective distribution of air filtration units

Best regards,

Sincerely,

Karen Maddelana

Karen Maddelana
President
Friends of the Mary Ellen Welch Greenway
Cc: Nathalia Benitez, COB Neighborhood Services and District 1 City Councillor Gabriela Coletta.

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6. Responses to Comments

#	Author	Topic	Comment	Response
1. Massachusetts Department of Energy Resources; Paul F. Ormond				
1-1	Paul F. Ormond, Massachusetts Department of Energy Resources	Airport Planning	We recommend new construction and renovations use 100% efficient electric space and water heating. Efficient electrification entails the swapping of fossil fuels (natural gas, oil, propane) and fossil-fuel generated heat energy from the combined heat and power plant (CHP) with cold-climate rated air source heat pumps.	Massport is currently updating its design and construction guidelines to align with the *Roadmap to Net Zero by 2031*. The updated *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) will recommend all projects with vertical components to follow the current version of the Massachusetts Stretch Energy and Municipal Opt-In Specialized Building Code. Of the three compliance pathways available, projects are encouraged to follow the "All Electric" pathway.
1-2	Paul F. Ormond, Massachusetts Department of Energy Resources	Air Quality and Emissions Reduction	The energy and emissions reported appear to take into effect onsite renewable energy production. We recommend that building energy and emissions use be tracked with and without effect of onsite renewable energy production to assess building efficiency measures themselves.	Massport collects building level energy and emissions data as part of its utility revenue system. Through its Massport Infrastructure Conditions Assessment (MICA)/Buildings Conditions Assessment (BCA) program, Massport is identifying building energy efficiency measures, and is simultaneously identifying strategies to enhance the granularity of metering capabilities. The MICA/BCA program is modeling or calculating building level emissions, where possible. This effort will take time as metering is not available in all locations to facilitate the calculation of emissions. Massport will continue to identify opportunities for increased metering to assist in performing these calculations.
1-3	Paul F. Ormond, Massachusetts Department of Energy Resources	Air Quality and Emissions Reduction	In addition to utility provided electric and gas, Logan also uses central plant combined heat and power (CHP) to heat, cool, and power buildings. When CHP is used, the building emissions picture is more complex. To assess this, EDRs and ESPRs should also report the following: • Space and water heating end use consumption, estimated and broken down by heating which is provided by central plant steam versus heating provided by fossil-fuel fired (or other) equipment; • Space cooling end use consumption, estimated and broken down by cooling from central plant produced chilled water versus cooling provided by other non-CHP means;	Massport is working to implement projects that would improve the Authority's capacity to respond to these reporting recommendations. For example, Massport is currently updating its design and construction guidelines to align with its *Roadmap to Roadmap to Net Zero by 2031*. The *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) will require project design teams to estimate annual operational greenhouse gas (GHG) emissions, and for Massport to measure actual GHG emissions post occupancy. Operational emissions will be estimated using current year emission factors provided by the United States Environmental Protection Agency (U.S.EPA) Emission Factors Hub, consistent with Massport's *Roadmap to Net Zero by 2031*, annual Airport Carbon Accreditation disclosures, and regular EDR and ESPR GHG emissions reporting. Many of the emission factors utilized by Massport are in alignment with those provided by the Department of Energy Resources (DOER) Leading by Example Program via: https://www.mass.gov/info-details/leading-by-example-tools-and-resources#greenhouse-gas-calculator.

#	Author	Topic	Comment	Response
			• Estimated CHP heating, power, and cooling production efficiency.	
1-4	Paul F. Ormond, Massachusetts Department of Energy Resources	Content, Scope, EJ, Climate	In addition to utility provided electric and gas, Logan also uses central plant combined heat and power (CHP) to heat, cool, and power buildings. When CHP is used, the building emissions picture is more complex. To assess this, EDRs and ESPRs should also report the following: • Space and water heating end use consumption, estimated and broken down by heating which is provided by central plant steam versus heating provided by fossil-fuel fired (or other) equipment; • Space cooling end use consumption, estimated and broken down by cooling from central plant produced chilled water versus cooling provided by other non-CHP means; • Estimated CHP heating, power, and cooling production efficiency.] Once the above is estimated, the emissions of building space heating, space cooling, and service water heating can then be estimated. This analysis should be done using electric grid emissions of 633 pounds per megawatt hour (lbs/MWhr) for year 2022 and 200 lbs/MWhr for year 2050 to provide a picture of current and future emissions footprints.	Massport is currently updating its design and construction guidelines to align with the *Roadmap to Net Zero by 2031*. The *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) will require project design teams to estimate annual operational GHG emissions, and for Massport to measure GHG emission actuals post-occupancy. Operational emissions will be estimated using current-year emission factors provided by the United States Environmental Protection Agency (U.S.EPA) Emission Factors Hub, consistent with Massport's *Roadmap to Net Zero by 2031*, annual Airport Carbon Accreditation (ACA) disclosures, and regular Environmental Data Report (EDR) and Environmental Status and Planning Report (ESPR) GHG emissions reporting. Many of the emission factors utilized by Massport are in alignment with those provided by the Department of Energy Resources (DOER) Leading by Example Program via: https://www.mass.gov/info-details/leading-by-example-tools-and-resources#greenhouse-gas-calculator. The ESPRs and EDRs report emissions based on modeling methodology, which follows industry standards and regulatory guidelines, but ESPRs and EDRs are materially different from project-specific reporting for project-derived impacts. An EDR/ESPR's emissions inventory reports on trends at a macro-scale, whereas each Massachusetts Environmental Policy Act (MEPA) applicable project has a more detailed and project-specific emissions inventory and analysis. The rationale and supporting justifications for the methodology used in the ESPRs and EDRs is provided in Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5. Massport continues to implement new projects that are intended improve the Authority's ability to respond to these reporting recommendations.

#	Author	Topic	Comment	Response

1-5	Paul F. Ormond, Massachusetts Department of Energy Resources	Air Quality and Emissions Reduction	For new buildings, new building additions, and buildings which undergo alterations and/or change of use, we recommend the following:
			• Prioritize building design and construction practices that result in low heating and cooling thermal energy demand intensity (TEDI) with:
			  o Built-up, framed, insulated walls with continuous insulation;
			  o Thermally-broken windows and other components to eliminate thermal bridges;
			  o Minimizing glass curtain wall assemblies and excessive windows;
			  o Low air-infiltration, confirmed with in-building air-infiltration testing;
			  o High levels of energy recovery;
			  o Management of solar heat gains.
				Massport is updating its *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) in 2024 which will substantially address these opportunities including encouraging projects to work towards meeting the Massport's net zero emissions target, which would include design strategies that optimize energy use intensity (EUI), mitigate heat losses and gains, and work in energy recovery strategies as feasible. In addition, projects are encouraged to meet the new Massachusetts Stretch Energy and Municipal Opt-In Specialized Building Code, as feasible.

1-6	Paul F. Ormond, Massachusetts Department of Energy Resources	Content, Scope, EJ, Climate	If new or renovated residential or hotel space is planned, pursue Passivehouse (ether PHIUS or PHI certifications.)	Massport does not anticipate new or renovated residential or hotel space to be constructed at Logan Airport in the foreseeable future. Massport is currently updating its design and construction guidelines to align with the *Roadmap to Net Zero by 2031*. The *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) will encourage project design teams leverage feasible passive design strategies and optimize energy efficiency to reduce projects' total energy demand. Massport encourages, but does not require, pursuit of Passive House Institute, Inc.'s Phius ZERO™ certification. Where applicable, the SRDSGs will require projects to achieve the U.S. Green Building Council's (U.S.GBC) Leadership in Energy and Environmental Design (LEED®) Zero Carbon Certification. Facilities at the Airport that have received LEED® Certification are detailed in Chapter 2, *Sustainability, Outreach, and Environmental Justice,* Table 2-3.
1-7	Paul F. Ormond, Massachusetts Department of Energy Resources	Content, Scope, EJ, Climate	Use air source heat pump space and water heating.	Massport is currently updating its design and construction guidelines to align with the *Roadmap to Net Zero by 2031*. The *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) will encourage projects with vertical components to follow the current version of the Massachusetts Stretch Energy and Municipal Opt-In Specialized Building Code. Of the three compliance pathways available, projects are encouraged to follow the "All Electric" pathway.

#	Author	Topic	Comment	Response
1-8	Paul F. Ormond, Massachusetts Department of Energy Resources	Content, Scope, EJ, Climate	Avoid use of natural gas CHP and onsite gas combustion for space and water heating.	Massport is currently updating its design and construction guidelines to align with the *Roadmap to Net Zero by 2031*. The *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) will encourage projects with vertical components to follow the current version of the Massachusetts Stretch Energy and Municipal Opt-In Specialized Building Code. Of the three compliance pathways available, projects are encouraged to follow the "All Electric" pathway.
1-9	Paul F. Ormond, Massachusetts Department of Energy Resources	Content, Scope, EJ, Climate	Set aside as much rooftop space for solar as possible, including for projects in which solar may not be built as part of initial project.	Massport is currently updating its design and construction guidelines to align with the *Roadmap to Net Zero by 2031*. The *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) will include recommended standards for the integration of onsite and offsite renewables when feasible and encourage pursuit of LEED® Zero Carbon Certification. Further, design teams of parking projects will evaluate the opportunity for 100 percent of total onsite electricity consumption with onsite renewable energy generation, with exceptions for electric vehicle charging as needed. Such omissions will be covered through Massport's other renewable energy generation, procurements, or both. Renewable energy requirements for vertical projects will prioritize onsite generation, followed by local generation on Massport properties, then offsite generation projects such as through power purchase agreements, and finally energy attribute certificates and renewable energy certificates allowable until 2040. Such efforts to support renewable energy may include support for photovoltaic (PV) readiness on rooftops or via other siting opportunities, depending on feasibility as projects are designed and constructed.
1-10	Paul F. Ormond, Massachusetts Department of Energy Resources	Airport Planning	Prepare for ubiquitous electric vehicles (EVs) with as much EV and EV ready parking spaces	Massport is currently updating its design and construction guidelines to align with the *Roadmap to Net Zero by 2031*. The electric vehicle (EV) charging services and capacity to be provided will correspond to the needs of airport users, with considerations incorporated into the planning process for vehicle duration of stay on Airport property, parking space availability, and site limitations, such as available electrical capacity. Massport will continue to update plans for accommodating EVs and the SRDSGs to meet increasing local and regional adoption of EV use.

#	Author	Topic	Comment	Response
2. Massport Community Advisory Committee; Aaron Toffler				
2-1	Aaron Toffler, Massport Community Advisory Committee	Forecasting	In the Certificate of the Secretary of Energy and Environmental Affairs on the 2018/2019 Logan Airport Environmental Data Report (March 19, 2021), the Secretary said that "the next EDR should describe the methodology for the forthcoming future forecast which should be provided in the *2022 ESPR*." The MCAC would repeat this request to understand more fully how much growth is expected at the airport in the future and what mitigation will be necessary to protect our member communities.	Chapter 3, *Activity Levels and Forecasting*, Section 3.4, of the *2022 ESPR* describes methodology for future forecasting. The chapter describes the use of 1) historical trends; 2) recent developments including COVID recovery; and 3) outlook for future demand drivers such as local and national economic growth. Chapter 3, *Activity Levels and Forecasting* also presents multiple tables providing data, and narrative explanation of the forecast growth in levels of passengers and aircraft operations at the airport. A comprehensive list of data sources that were referenced in the forecasting process is listed in Chapter 3, *Activity Levels and Forecasting,* Section 3.4. Massport follows industry best practices in preparing Future Planning Horizon and considers several factors: economic conditions, airplane manufacturers' plans, future aircraft in the fleet mix, social factors, anticipated airline route plans and many others. The assumptions and sources of data are documented in Chapter 3, *Activity Levels and Forecasting,* Section 3.5 and in Appendix F, *Activity Levels Supporting Documentation*. As a result of feedback from Environmental Status and Planning Report (ESPR) pre-filing meetings, additional content to clarify the forecasting process and methodologies was added to Chapter 3, *Activity Levels and Forecasting,* and Appendix F, *Activity Levels Supporting Documentation*, and relevant technical chapters. Additionally, data for baseline conditions from applicable comparison years were added to technical chapters to provide a contextual frame of reference for the conditions reported for the current year as well as for the forecasted future conditions and assumptions. Massport has and will continue to enhance public engagement as part of preparing the ESPR and future Environmental Data Reports (EDRs). To date, three additional meetings have been convened with the Executive Office of Energy and Environmental Affairs (EEA) and stakeholders regarding the format of the ESPR to develop strategies to improve readability for the general public. The first public information session on June 29, 2023, described the methodologies employed in the ESPR to develop future forecasts and technical approaches to modeling. A second session on December 12, 2023, with community advocacy group representatives and the EEA focused on review of *2020/2021 EDR* comments and discussed ways to better address these comments in the *2022 ESPR*. On January 17, 2024, a public information meeting provided an update on the ESPR preparation and findings. A fourth public information session will be held after the ESPR is filed with the Massachusetts Environmental Policy Act (MEPA) Office during the public review period. Broad notification of these meetings is facilitated through notices in multiple languages in newspapers, distribution to community-based organizations (CBOs) and tribes on the EEA's Environmental Justice (EJ) Reference List, previous

#	Author	Topic	Comment	Response
				reviewers, public libraries, Massport Community Advisory Committee (Massport CAC) and key community repositories.
2-2	Aaron Toffler, Massport Community Advisory Committee	Ground Access	The EDR discusses efforts to evaluate new Logan Express sites without going into detail about what factors are considered or how each line of the service is currently performing. As ground access and increasing the share of HOV users to the airport are important issues, more information would allow the MCAC to partner with Massport and make recommendations for minimizing impact to our communities, particularly those that are near to the airport itself. More detailed information on parking usage and how rates are set would serve the same purpose.	Prior to the COVID-19 pandemic, Massport was aggressively moving forward with new and expanded high-occupancy vehicle (HOV) services including expansion of Logan Express service hours, facility enhancements and expansion of the Logan Airport Express's Framingham Garage. In late 2019, Massport also purchased new buses for the planned new North Station to Suburban Logan Airport Express Service. As with many planned (HOV enhancements prior to the COVID-19 outbreak, those services were suspended, reduced or deferred based on ridership demand and reduced revenues. As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, and projects are prioritized based on passenger needs and user demand. Updates on projects deferred due to COVID are discussed in Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 and are summarized as follows: • Postponed Terminal E Improvement Phases 1 and 2: Terminal E Phase 1 opened in October 2023, and the next phase to add four new gates is currently in conceptual planning process. • Postponed Parking Garage in front of Terminal E: The project has resumed and currently in preliminary design phases. • Suspended Logan Express service from Peabody, Woburn, and Back Bay: Services restored in 2022. • Logan Express headways reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and new Quincy lot is helping to increase passenger capacity at Braintree as well as a parking expansion at Framingham, which is also helping to improve passenger use. • Postponed construction of additional parking at Framingham Logan Express: Project has resumed and is in the design phase with construction currently estimated to begin in 2024. • New Logan Express suburban location: Peabody Logan Express at new North Shore location opened in 2022 and planning for relocation to a new/enhances site in Danvers is underway for a planned late 2024 opening. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing Back Bay Logan Express. • Dedicated High Occupancy Vehicle (HOV) bus lanes: HOV prioritization initiatives, including HOV bus lanes, are underway throughout the Logan Airport campus. Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity

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				levels increase. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line. The results of the *2022 Logan Airport Air Passenger Ground-Access Survey* informed the HOV, and ground access strategy as described in Chapter 6, *Ground Access*, Section 6.5. This strategy is evaluated on an on-going basis to adapt to the changes associated with the pandemic and the resultant passenger demands for airport access. Chapter 7, *Noise*, Section 7.4 and Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5 discuss air and noise strategies to extend past project-specific mitigation and provide additional impact offset strategies and initiatives.
2-3	Aaron Toffler, Massport Community Advisory Committee	Noise	Massport collects a great deal of information from its noise monitoring system which could be useful in supporting our participation in this effort. Sharing this information with our members would assist us in determining the optimal placement of these monitors as well as evaluating the data that they produce.	Massport publishes detailed information on our website, including noise complaints, runway use, near-live flight tracking software (https://www.massport.com/environment/noise-abatement/logan-airport). For over three decades, Massport has provided extensive information on noise monitoring, noise modeling and associated inputs, including detailed technical appendices in ESPRs and EDRs. Massport's permanent noise monitoring program consists of 30 noise monitors located around the Airport and environs, and Massport recently upgraded the Noise and Operations Monitoring System (NOMS), replacing 29 of 30 monitors. Massport worked with community stakeholders to identify optimal locations for the noise monitors that generally aligned with the runway ends and direction of takeoffs and landings. During normal operation, the noise monitors continuously measure noise exposure levels as well as a variety of metrics associated with individual noise events that exceed preset threshold sound levels. Noise monitoring data are transmitted back to Massport's Noise Office, where daily night average noise level (DNL) values and other noise metrics are computed for each location and are summarized in various reports. Noise monitors collect sound data from not only aircraft noise events but also surrounding noise events such as roadway traffic and construction. Software algorithms identify aircraft noise events which allows Massport to separately calculate total DNL and aircraft only DNL.

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3.	**Air, Inc**			
3-1	AIR, Inc.	Airport Planning	Address each of our past comments from the 2015, 2016, and 2018 / 2019 EDRs, the Terminal E Modernization Project, the Logan Parking Project, and the 2017 ESPR.	Massport carefully reviews Environmental Data Report (EDR) and Environmental Status and Planning Report (ESPR) comments received and strives to be responsive to each commentor. The Massachusetts Environmental Policy Act (MEPA) Certificate provides formal guidance on specific topics to be addressed in the ensuing filings, and Massport consistently addresses all of these scoping requirements. When comments request information or actions outside the Certificate requirements or are not within Massport's ability to accommodate, Massport strives to respond as appropriate. If the Executive Office of Energy and Environmental Affairs (EEA) determines Massport has not fully responded to or addressed comments the EEA has deemed relevant, the EEA may require those comments be addressed by incorporating them into future ESPR or EDR scoping requirements. Public comments provided for project-specific MEPA filings are responded to within that regulatory framework, but individual comments on specific projects are not always within the scope or intended purpose of EDRs and ESPRs. Status updates on projects and project-specific mitigation are provided in Chapter 10, *Project Mitigation*, and future EDRs and ESPRs will continue to report this information.
3-2	AIR, Inc.	Content, Scope, EJ, Climate	Limit the length of all environmental compliance documents.	Massport has responded to this comment by implementing many ESPR format enhancements to improve readability and audience accessibility including: • Shortening the overall document; • Moving technical information on methodologies and assumptions as well as supporting data used in analyses to technical appendices; • Increasing use of infographics, charts, and illustrations in place of long text explanations; • Revising text to use more common vernacular and word choice with less technical jargon; • Removing previously published materials currently available from other sources, like prior ESPR and EDR publications hosted on Massport websites; and • Using icons and call-out boxes to highlight important data or findings to facilitate faster reading and comprehension.

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3-3	AIR, Inc.	Content, Scope, EJ, Climate	MEPA and EEA must require that Massport's MEPA submissions are succinct and readable.	While the monitoring and analysis of operations and impacts from a major international airport requires large quantities of detailed data and information, Massport has responded to this comment by implementing many ESPR format enhancements to improve readability and audience accessibility including: • Shortening the overall document; • Moving technical information on methodologies and assumptions as well as supporting data used in analyses to technical appendices; • Increasing use of infographics, charts, and illustrations in place of long text explanations; • Revising text to use more common vernacular and word choice with less technical jargon; • Removing previously published materials currently available from other sources, like prior ESPR and EDR publications hosted on Massport websites; and • Using icons and call-out boxes to highlight important data or findings to facilitate faster reading and comprehension.
3-4	AIR, Inc.	Content, Scope, EJ, Climate	Calculate and report the socialized costs of Logan Airport operations.	The purpose of the ESPR is to report on the environmental conditions of the areas surrounding Logan Airport, and report on industry standard metrics and indicators of environmental variables. This ESPR provides additional information on public health existing conditions in communities within 1 mile of Logan Airport for all population groups and Environmental Justice populations. See Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4.
3-5	AIR, Inc.	Mitigation	Develop a schedule of proactive policy and mitigation responses to future impact levels.	As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, such as Logan Express services and the Logan Parking Project, and projects are prioritized based on passenger needs, user demand and their effectiveness in reducing operational and environmental impacts associated with current activity levels. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 discusses the status of deferred capital projects and provides discussion on the methodology for when these projects will resume. Chapter 4, *Airport Planning*, Table 4-1 summarizes Massport's short and long-term planning initiatives as well as a current status schedule for implementation. As passenger activity recovers, and impacts from those additional activities grow, Massport restores service and restarts select postponed projects. Updates on projects deferred due to the COVID-19 pandemic are as follows: • Postponed Terminal E Improvement Phases 1 and 2: Terminal E Phase 1 opened in October 2023, and the next phase to add four new gates is currently in conceptual planning process.

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				• Postponed Parking Garage in front of Terminal E: The project has resumed and currently in preliminary design phases. • Suspended Logan Express service from Peabody, Woburn, and Back Bay: Services restored in 2022. • Logan Express headways reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and new Quincy lot is helping to increase passenger capacity at Braintree as well as a parking expansion at Framingham, which is also helping to improve passenger use. • Postponed construction of additional parking at Framingham Logan Express: Project has resumed and is in the design phase with construction currently estimated to begin in 2024. • New Logan Express suburban location: Peabody Logan Express at new North Shore location opened in 2022 and planning for relocation to a new/enhances site in Danvers is underway for a planned late 2024 opening. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing Back Bay Logan Express. • Dedicated High Occupancy Vehicle (HOV) bus lanes: HOV prioritization initiatives, including HOV bus lanes, are underway throughout the Logan Airport campus. Planned mitigation measures for specific projects at Logan Airport and information on deferrals and when projects will resume are detailed in Chapter 10, *Project Mitigation*, and Massport will continue to refine estimates and resume previously planned projects as growth and activity levels increase. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line. Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.2 provides an overview of measures Massport takes to avoid, minimize, and offset the environmental effects of airport operations. In addition, an EJ and Public Health Existing Conditions Review has been included in the *2022 ESPR* to assess the existing environmental and health conditions currently experienced by the Airport's surrounding communities, including Environmental Justice (EJ) communities. See Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4 and Section 2.5 When it is possible for Massport to differentiate effects of Airport activities from those derived from other impact sources in the surrounding community, these effects and associated measures taken to offset these effects are reported on in the technical chapters, such as Chapter 7, *Noise*, or Chapter 10, *Project Mitigation*, for example.

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				Massport is currently updating its *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) and construction sustainability guidelines to align with the *Roadmap to Net Zero by 2031* and improve its proactive measures that respond to potential impacts that could result from future developments. Responses to Comment 1-1 and 1-10 provide additional details on some of these improvements.
3-6	AIR, Inc.	Activity Levels	Provide comprehensive data [flight operations and passenger activity levels].	Chapter 3, *Activity Levels and Forecasting*, Section 3.1, provides detailed information on domestic and international passenger activity levels, and aircraft operations. Additional information on aircraft types and fleet mix, schedules, and flight destinations are included in Appendix F, *Activity Levels Supporting Documentation*, to Chapter 7, *Noise*, Section 7.2.1 and these inputs are used in ground, noise, and air analysis.
3-7	AIR, Inc.	Air Quality and Emissions Reduction	Provide an accurate and detailed reporting of on-airport vehicle idling data, and a plan to control this avoidable form of pollution.	As part of its *Roadmap to Net Zero by 2031* initiative, Massport is working on fleet and equipment decarbonization for Massport facilities and supporting tenant's efforts to reduce greenhouse gas (GHG) emissions. Progress will be reported in forthcoming EDRs and ESPRs. The status of industry air quality studies on topics, including ultrafine particles (UFP), black carbon (BC), local public health impacts, etc., will continue to be reported and discussed, as described in Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5. The Response to Comment A-6 provides a more detailed description of on-going air quality studies undertaken by Massport as well as other academic and research institutions. In addition, an EJ and Public Health Existing Conditions Review has been included in the *2022 ESPR* to assess the existing environmental and health conditions currently experienced by the Airport's surrounding communities, including Environmental Justice (EJ) communities. See Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4 and Section 2.5 As part of the *2022 ESPR*, Massport conducted an idling and dwell time study to update the vehicle dwell time information for the Terminal A arrivals and departure curbs across all modes and Terminal B buses. Terminal A was used as a suitable proxy for the other terminals given the limitations associated with the on-going construction at Terminals B, C, and E during the course of the study. The study included in-person observations of the cell phone lot to determine the extent which vehicles were dwelling with engines running, or idling. Massachusetts General Law (MGL) requires vehicles to shut off engines when stationary or parked for more than five (5) minutes. Massport has enforcement mechanisms in place at the taxi, RideApp, bus, and limo pool areas, therefore dwelling vehicles were not observed at these locations. The study provided updated input data, which was used to complete the ground access and air quality modeling of current and future forecasted conditions for the *2022 ESPR*, and this information was integrated into the relevant discussion sections of Chapter 6, *Ground Access*, Section 6.5 and

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				Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.2.1. As construction at the other terminal curbs are completed, Massport will conduct idling and dwell time studies at those locations and report on findings in upcoming EDRs or ESPRs.
3-8	AIR, Inc.	Air Quality and Emissions Reduction	Commence planning for aircraft emissions reduction programs at Logan by: • Initiating a groundbreaking tri-state regional airport master planning process. • Developing an airport Emissions Rule. • Making single engine taxiing mandatory. • Development if a proposed electric aircraft airports plan. • Developing a Beta testing plan for electric aircraft which assures that electric aircraft distribution will benefit EJ communities. • Develop electric aircraft infrastructure and evaluate alternate technologies to generate power such as installation of microgrids and airfield solar farms. • Immediately designing and fully funding a community air filtration program for classroom and residential applications.	Massport has a comprehensive air and GHG emissions reduction program in place. While Massport does not have control over aircraft and aircraft related emissions, Massport is working closely with its airline partners to reduce emissions. Examples of these efforts include those discussed below. • Providing electric charging infrastructure to facilitate use of electric ground service equipment (eGSE). In 2020, Massport received a $4 million Voluntary Airport Low Emissions Program (VALE) grant to acquire charging stations at Logan for eGSE (electric ground service equipment). In 2018, the United States Environmental Protection Agency (U.S.EPA) granted Massport $500,000 to install airline-owned eGSE charging stations at Logan's Terminal B. • Promoting the use of sustainable aviation fuel (SAF) through the submission of a grant proposal to the Federal Aviation Administration (FAA) as part of its Fueling Aviation's Sustainable Transition (FAST) Grant program to study the facility of transporting SAF from the mid-west to Logan Airport. Massport continues to keep up to date on SAF usage and availability in the northeastern U.S. • At Massport's June 2023 board meeting, discussions focused on the future of electric aircraft and electric vertical takeoff and landing (eVTOL) and how Massport needs to be ready to accommodate these aircraft. Planning for additional e-aircraft is part of Massport's *Roadmap to Net Zero by 2031* GHG strategy. • Regarding air filtration, Massport has renewed an agreement to provide funding to the East Boston Neighborhood Health Center (EBNHC) to help expand the efforts of their Asthma and Chronic Obstructive Pulmonary Disease (COPD) Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits. When working with the EBNHC regarding installation of high efficiency particulate air (HEPA) filters in homes and other locations, representatives of the Center stated that home visits would be a more effective tool than filters. Accordingly, Massport is continuing to fund the home visit program.
3-9	AIR, Inc.	Ground Access	Consider the costs and benefits of all viable ground access policy and mitigation alternatives, including use of an airport roadway fee, and all reasonable monetary and	Massport continues to evaluate ground access opportunities in relation to mode share goals, forecasted air passenger levels, and policy alternatives. An update on the performance of current policies and strategies for improving ground access to Logan Airport while reducing emissions and traffic congestion issues is provided in Chapter 6, *Ground Access*, Section 6.5.

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			non-monetary pricing adjustments under Massport's control.	
3-10	AIR, Inc.	Air Quality and Emissions Reduction	Acknowledge the disparities of scale factoring into Massport's emissions reporting.	Chapter 3, *Activity Levels and Forecasting*, Section 3.4 describes the forecasting methodologies used for future planning activity levels. This ESPR reports on 2022 conditions with a comparison to 2021 and 2019 conditions and captures pandemic and post pandemic growth trends for activity levels. Massport follows industry best practices for forecasts and emissions reporting. As described in Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.2.3, Massport uses the FAA's-required Aviation Environmental Design Tool (AEDT) for air quality modeling of aircraft-related emissions and aircraft noise modeling. Consistent with past practice, the version of AEDT that is current at the inception of the study AEDT version 3e, released on May 9, 2022, was used to model 2022 data. The most recent version of the United States Environmental Protection Agency's (U.S.EPA) Motor Vehicle Emission Simulator (MOVES) version 3.1, released in November 2022 was used to estimate motor vehicle emissions on airport roadways. The assumptions and sources of data are documented in Chapter 3, *Activity Levels and Forecasting*, Section 3.4, and in Appendix F, *Activity Levels Supporting Documentation*. As a result of feedback from these meetings, additional content to clarify the forecasting process and methodologies was added to Chapter 3, *Activity Levels and Forecasting*, Section 3.4, Appendix F, *Activity Levels Supporting Documentation*, and relevant technical chapters. Additionally, data for baseline conditions from selected comparison years were added to technical chapters to provide a contextual frame of reference for the conditions reported for the current year as well as for the forecasted future conditions and assumptions. These comparisons will support Massport's data-driven approach to identifying which potential impact reduction measures could be feasible options for the future in addition to providing a framework for the public audience to assess the progress of Massport's efforts to date.
3-11	AIR, Inc.	Noise	Take action immediately to reduce nighttime aircraft noise.	While wind and weather conditions are the primary factors influencing runway use, the nighttime preferential runway is 15R-33L with arrivals to Runway 33L and departures from Runway 15R, known as head-to-head procedures, to keep flights over Boston Harbor as much as possible and away from noise-sensitive land uses. There are two noise abatement procedures in place for Runway 33L arrivals. The first is known as the Light Visual, and the second is a recently adopted Area Navigation (RNAV) Required Navigational Performance (RNP) called "RNAV (RNP) X RWY 33L Approach" which resulted from the RNAV Pilot Project. The FAA completed development of the RNP procedure and published it in December 2021. Chapter 7, Noise, Figure 7-12 shows the flight tracks of aircraft using these procedures in 2022. Massport is working with FAA on increasing use of this

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				procedure. Regarding ground noise at night, Logan Airport has a restriction on nighttime engine run-ups and use of aircraft auxiliary power units (APUs).
3-12	AIR, Inc.	Noise	Update the Preferential Runway Advisory System (PRAS), providing target percentages for runway use to control noise impacts, including nighttime noise.	Massport developed the Preferential Runway Advisory System (PRAS) in 1982, which had two primary objectives: to equitably distribute noise on an annual basis, and to provide short term relief from continuous operations over the same neighborhoods near the Airport. The PRAS consisted of two parts: A set of specific runway use goals to address the PRAS objectives; and a computer program to provide runway configuration recommendations to air traffic controllers based on weather, traffic, and PRAS goals. In February 2004, the PRAS system was suspended due to an upgrade of the FAA radar system during the consolidation of the Boston Terminal Control Center at the new facility in Merrimack, New Hampshire. During Phase 2 of the Boston Logan Airport Noise Study (BLANS), the Massport CAC voted to abandon PRAS because it had not achieved the intended noise abatement. Phase 3 of the BLANS focused on updating the Runway Use Program. Operational tests of a new program began in November 2014 and continued through September 2016. The BLANS project ended in 2016 without the Massport CAC agreeing on a new Runway Use Program. A final BLANS project report was issued in April 2017. Although PRAS is not in effect at Logan Airport, Massport continues to report on key PRAS statistics for public information purposes. Chapter 7, *Noise*, Table 7-6, provides the original PRAS goals and a comparison of effective runway use from 2019, 2021, and 2022.
3-13	AIR, Inc.	Air Quality and Emissions Reduction	Commence an actual emissions measurement and reporting system.	Air quality is a regional resource impacted by meteorological conditions, regional sources, and other factors. Air quality monitors in the region are unable to distinguish among different emission sources nor account for atmospheric impacts and therefore only changes in emissions can be quantified. The Massachusetts Department of Environmental Protection (MassDEP) and the United States Environmental Protection Agency (U.S.EPA) maintain a network of air quality monitors around the state to measure ambient air quality. Appendix J, *Air Quality and Emissions Reduction Supporting Documentation*, Figure J-5, illustrates the locations of these monitors. In addition to the MassDEP and U.S.EPA monitors, air

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				quality studies by research institutions and community groups listed in Response to Comment A-6 have deployed short-term air quality monitoring to conduct studies on air quality in the vicinity of the airport. Appendix J, *Air Quality and Emissions Reduction Supporting Documentation* Figure J-5 illustrates locations where short-term monitoring took place. Response to Comment A-6 briefly summarizes the outcome of these studies. Massport will continue to provide information in support of regional monitoring and research efforts.
3-15	AIR, Inc.	Content, Scope, EJ, Climate	Provide narrative context describing the relative effects on impact levels for metrics reported.	Chapter 2,*Sustainability, Outreach, and Environmental Justice*, Section 2.2 provides an overview of measures Massport takes to avoid, minimize, and offset the environmental effects of airport operations. Massport will continue conversations with the Massachusetts Environmental Policy Act (MEPA) Office and community stakeholders to refine this process, as feasible, in future EDRs and ESPRs.
3-16	AIR, Inc.	Airport Planning	MEPA and EEA must stop approving incremental airport capacity-building projects.	Massport's unique ESPR and EDR process is designed to provide cumulative context for individual projects at Logan Airport that may undergo MEPA review, National Environmental Policy Act (NEPA) review, or both. Many projects at Logan are designed to address projected impacts and include many design, construction and operational measures to reduce impacts that might otherwise occur. Where new projects result in impacts, Massport is required to avoid, minimize or mitigate for those impacts. Chapter 10, *Project Mitigation* reviews the status of project-specific mitigation measures currently being implemented or that were completed during the 2022 reporting year.
3-17	AIR, Inc.	Activity Levels	Disclose Logan's maximum flight and passenger capacity and report each year on the percentage of attainment of that level.	DRs/ESPRs provide context for understanding current and projected future passenger and flight activity and include analysis and trends of airlines such as passengers per flights, load factors, and passenger demand. An airport's throughput is determined by aircraft fleet mix, aircraft sizes, load factors, weather conditions, and operational requirements. Massport provides facilities to accommodate airlines' needs depending on those factors. EDRs and ESPRs have demonstrated that over the long run, the number of airport operations have gone down even as the numbers of passengers has increased due to higher load factors and aircraft efficiencies.
3-18	AIR, Inc.	Air Quality and Emissions Reduction	Substantiate any claimed improvement in air quality due to changes in the fleet (retirement of old, polluting aircraft) in quantitative terms.	Chapter 8, *Air Quality and Greenhouse Gas Emission,* Section 8.2.3 model changes in air quality associated with emissions sources such as aircraft fleet mix and aircraft engine types. Using the FAA-approved AEDT model, which includes emissions factors for aircraft types, Massport models air emissions from aircraft, ground service equipment and other sources.

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4. Conservation Law Foundation; Staci Rubin				
4-1	Staci Rubin, Conservation Law Foundation	Airport Planning	Provide further detail on methodology and reporting requirements, prioritize mitigation efforts as travel patterns rebound, specify transparent thresholds for deferred mitigation projects, and direct robust and on-going community engagement.	As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, and projects are prioritized based on passenger needs and user demand. Updates on projects deferred due to COVID are discussed in **Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2**, and are summarized as follows: • **Postponed Terminal E Improvement Phases 1 and 2**: Terminal E Phase 1 opened in October 2023, and the next phase to add four new gates is currently in conceptual planning process. • **Postponed Parking Garage in front of Terminal E**: Permitted for up to an additional 5,000 spaces, the project has resumed and currently in preliminary design phases. • **Suspended Logan Express service** from Peabody, Woburn, and Back Bay: Services restored in 2022. • **Logan Express headways** reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and New Quincy lot is helping to increase passenger capacity at Braintree as well as a parking expansion at Framingham, which is also helping to improve passenger use. • Postponed construction of additional parking at Framingham Logan Express: Project has resumed and is in the design phase with construction currently estimated to begin in 2024. • **New Logan Express suburban location**: Peabody Logan Express at new North Shore location opened in 2022. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing Back Bay Logan Express. Danvers Logan Express is expected to open towards the end of 2024. • **Dedicated High-Occupancy Vehicle (HOV) bus lanes**: HOV prioritization initiatives, including HOV bus lanes, are underway throughout Logan Airport campus. Planned mitigation measures for specific projects at Logan Airport are detailed in **Chapter 10, *Project Mitigation***, and will continue to be refined as growth and activity levels increase. Future Environmental Data Reports (EDR) and Environmental Status and Planning Reports (ESPR) will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line. **Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.2** provides an overview of measures Massport takes to avoid, minimize, and offset the environmental effects of airport operations. In addition, an EJ and Public Health Existing Conditions Review has been included in the *2022 ESPR* to assess the

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				existing environmental and health conditions currently experienced by the Airport's surrounding communities, including Environmental Justice (EJ) communities. See **Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4 and Section 2.5** The existing conditions are derived from regional sources provided by state entities such as the Massachusetts Department of Environmental Protection (MassDEP) and the Massachusetts Department of Public Health (MassDPH) and are not associated with one specific entity or activity. When it is possible for Massport to differentiate effects of Airport activities from those derived from other impact sources in the surrounding community, these effects and associated measures taken to offset these effects are reported on in the technical chapters, such as **Chapter 7, *Noise*** or **Chapter 10, *Project Mitigation***, for example.
4-2	Staci Rubin, Conservation Law Foundation	Mitigation	Ensure that mitigation efforts keep up with increasing rates of travel as pandemic restrictions ease and travel resumes.	Due to the impacts and significant reduction in demand from the COVID-19 pandemic, Massport paused a number of projects and activities. As passenger activity recovers, Massport restores service and restarts select postponed projects. The status of Massport's mitigation commitment related to key projects is documented in **Chapter 10, *Project Mitigation.*** *A* new chapter of this *2022 ESPR*, **Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.2**, documents Massport's extensive community benefits that includes providing community open space and parklands, Science, Technology, Engineering, and Math (STEM) programs, internships and summer jobs programs for local youth, and many other examples of community giving. In addition, In addition, an EJ and Public Health Existing Conditions Review has been included in the *2022 ESPR* to assess the existing environmental and health conditions currently experienced by the Airport's surrounding communities, including Environmental Justice (EJ) communities. See **Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4 and Section 2.5** Massport is currently updating its *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) and construction sustainability guidelines to align with the *Roadmap to Net Zero by 2031* and improve its proactive measures that respond to potential impacts that could result from future developments. Responses to Comment 1-1 and 1-10 provide additional details on some of these improvements. The results of the *2022 Logan Airport Air Passenger Ground-Access Survey* informed the HOV, and ground access strategy as described in **Chapter 6, *Ground Access*, Section 6.5,** This strategy is being evaluated on an on-going basis to adapt to the changes associated with the pandemic and the resultant passenger demands for airport access. **Chapter 7, *Noise*, Section 7.4 and Chapter 8, *Air Quality*, Section 8.5** discuss air and noise strategies to extend past project-specific mitigation and provide additional impact offset strategies and initiatives.

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4-3	Staci Rubin, Conservation Law Foundation	Airport Planning	Provide further direct robust and on-going community engagement.	Massport has and will continue to enhance public engagement as part of preparing the ESPR and future EDRs. To date, for this ESPR, three additional meetings have been convened with the Executive Office of Energy and Environmental Affairs (EEA) and stakeholders regarding the format of the ESPR to develop strategies to improve readability for the general public. The first public information session on June 29, 2023, described the methodologies employed in the ESPR to develop Future Planning Horizon and technical approaches to modeling. A second session on December 12, 2023, with community advocacy group representatives and the EEA focused on review of *2020/2021 EDR* comments and discussed ways to better address these comments in the *2022 ESPR*. On January 17, 2024, a public information meeting provided an update on the ESPR preparation and findings. A fourth public information session will be held after the ESPR is filed with the Massachusetts Environmental Policy Act (MEPA) Office during the public review period. Broad notification of these meetings is facilitated through notices in multiple languages in newspapers, distribution to community-based organizations (CBOs) and tribes on the EEA's EJ Reference List, previous reviewers, public libraries, and key community repositories.
4-4	Staci Rubin, Conservation Law Foundation	Air Quality and Emissions Reduction	Urgently prioritize mitigation efforts to reduce and ideally avoid human and environmental harms. The Secretary previously recommended that Massport work to fund the provision of HEPA room air purifier filters in key community locations such as schools, and to work with community-based organizations to collaboratively determine how to further mitigate air quality impacts. We urge Massport to continue working with community-based organizations that have long been involved in this work, such as AIR, Inc., GreenRoots, Inc., and Mothers Out Front, and to support the dissemination of air filtration.	Massport continues to work with the Federal Aviation Administration (FAA) and research institutions like MIT, Boston University, and Tufts University to look for ways to reduce impacts and expand research. Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5 provides an update on its on-going collaboration and evolving service strategy with the Massachusetts Department of Public Health (MassDPH) and East Boston Neighborhood Health Center (EBNHC). Massport has renewed an agreement to provide funding to the EBNHC to help expand the efforts of their Asthma and COPD Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits. When working with the EBNHC regarding installation of high efficiency particulate air (HEPA) filters in home and other locations, representatives of the Center stated that home visits would be a more effective tool than filters. Accordingly, Massport is funding the home visit program. Massport will continue to work with community-based organizations and will support science-based solutions and efforts.

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4-5	Staci Rubin, Conservation Law Foundation	Air Quality and Emissions Reduction	We also note the reference in the *2020/2021 EDR* to recent and on-going research studies including the current work of Boston University and Tufts University on Ultrafine Particulates (UFPs). Provide a more detailed update on the study and how findings may relate to Massport activities.	Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5 provides updated information on recent and on-going scientific studies associated with airport emissions including the 2014 Logan Airport Health Study by MassDPH, the 2020 study "Impacts of Aviation Emissions on Near-Airport Residential Air Quality" by Tufts University, and similar airport-related health studies by the University of Southern California and University of Washington. The findings show that key differences exist in the particle size distribution and the black carbon (BC) concentration for roadway and aircraft features. Massport has an extensive air emissions mitigation program that benefits communities including East Boston, Chelsea, Revere, South Boston, and Winthrop. This includes time and location limits on engine runups, late night runway use preference, single engine taxiing, gate plug-in technology, runway use limitations, and aircraft towing requirements. Massport has also begun a program to electrify, where possible, airfield ground service equipment (GSE). Massport continues to work with FAA and research institutions like MIT, Boston University, and Tufts University to look for ways to reduce impacts and expand research including on ultrafine particulates (UFP). Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.3, provides an update on its on-going collaboration on research efforts in which Massport provides data to support the studies. As part of the FAA-affiliated Center of Excellence for Alternative Jet Fuels and Environment, also known as the Aviation Sustainability Center (ASCENT), Massport is supporting a Boston University research effort to assess Community Measurements of Aviation Emission Contributions to Ambient Air Quality. The primary goal of this project was to conduct a new air pollution monitoring campaign beneath flight paths to and from Logan Airport, using a protocol specifically designed to determine the magnitude and spatial distribution of UFPs in the vicinity of arrival flight paths. Data were collected to assess whether aircraft emissions, particularly arrival emissions, significantly contribute to UFP concentrations at appreciable distances from the airport. For additional information refer to: https://s3.wp.wsu.edu/uploads/sites/2479/2022/10/ASCENT-Project-018-2021-Annual-Report.pdf
4-6	Staci Rubin, Conservation Law Foundation	Air Quality and Emissions Reduction	The use of HEPA filters and other mitigation techniques should be a key goal to ensure that the negative impacts of airport activity are prevented and offset.	Massport has renewed a funding agreement with the EBNHC to help expand the efforts of their Asthma and COPD Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits. When discussing with the EBNHC regarding installation of HEPA filters in home and other locations, representatives of the Center stated that home visits would be a more effective tool than filters. Accordingly, Massport is funding the home visit program.

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4-7	Staci Rubin, Conservation Law Foundation	Forecasting	Clarify and refine the process for estimating growth rates and other calculations and provide additional detail for the forecast methodology.	Chapter 3, *Activity Levels and Forecasting*, Section 3.4, of this *2022 ESPR* describes methodology for future forecasting and including future forecast growth. Massport follows industry best practices for forecasts and considers several factors including economic conditions; airplane manufacturers' plans; future forecast aircraft in the fleet mix; social factors; and anticipated airline route plans. Additional explanation on forecasting methodology is provided Chapter 3, *Activity Levels and Forecasting*, Section 3.4 4, and Appendix F, *Activity Levels Supporting Documentation*. To improve presentation of complex information, the description of the forecasting methodology is enhanced with graphics, tables and icons.
4-8	Staci Rubin, Conservation Law Foundation	Forecasting	We commend the inclusion of the section outlining the *2022 ESPR* Forecast Methodology in the current EDR and encourage even further detail and transparency in this section of the *2020/2021 EDR*, in the *2022 ESPR*, and in future reporting.	As described in Response to Comment 4-7, Chapter 3, *Activity Levels and Forecasting*, Section 3.4, describes methodology for future forecasting and including future growth. Massport follows industry best practices for forecasts and considers several factors including economic conditions; airplane manufacturers' plans; future aircraft in the fleet mix; social factors; and anticipated airline route plans. Additional explanation on forecasting methodology is provided in Chapter 3, *Activity Levels and Forecasting*, Section 3.4 and Appendix F, *Activity Levels Supporting Documentation*. To improve presentation of complex information, the description of the forecasting methodology is enhanced with graphics, tables and icons as well as further information on how the methodology compares to FAA methods and is in alignment with current aviation industry modeling standards. The Chapter also describes the use of industry-standard forecast techniques as recommended in FAA policy documents, including statistical econometric analysis.
4-9	Staci Rubin, Conservation Law Foundation	Content, Scope, EJ, Climate	Provide a list of all measured impacts, how said impacts are methodologically related to the activity levels presented in the ESPR forecast, and how current and forward-looking data can be used instead in both the MEPA reporting process, and in other public engagement forums.	Massport environmental analyses primarily focus on measured and modeled impacts associated with aircraft noise, air emissions, ground access and water quality. The results of those analyses inform planning for impact reductions and operational conditions. A key purpose of the EDR/ESPR process is to provide a cumulative assessment of Logan operational and environmental conditions which helps inform individual project planning, design and construction. The results of these analyses are shared with the public annually through the EDR/ESPR process as well as during environmental permitting of individual projects. The periodic activity level forecast updates are used to inform both current operations as well as near-term and long-term project and operations planning.

#	Author	Topic	Comment	Response
4-10	Staci Rubin, Conservation Law Foundation	Content, Scope, EJ, Climate	Work with community stakeholders to create a mitigation planning system which is based on actual passenger, flight, and daily traffic volumes.	When required in accordance with the MEPA process, mitigation is applied on an individual project basis, as described in Chapter 10, *Project Mitigation.* Massport also implements a wide range of on-going measures to enhance operational efficiency and reduce overall environmental impacts. The community benefits, as detailed in Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.2 continually evolve as passenger, flight, and traffic volumes change. As discussed in the December 12, 2023, meeting with Executive Office of Energy and Environmental Affairs (EEA) and community stakeholders, Massport will continue to engage with the EEA and community stakeholders throughout the development of future EDRs and ESPRs to allow for discussion about community benefits and to receive commentary on planned activities, programs, and initiatives.
4-11	Staci Rubin, Conservation Law Foundation	Air Quality and Emissions Reduction	More thoroughly document public health impacts.	Massport will continue to work with community-based organizations (CBOs) and will support science-based solutions and efforts to improve public health and will report on them in EDRs and ESPRs. Chapter 2, *Sustainability, Outreach, and Environmental Justice,* Section 2.5, describes the research efforts and health studies Massport is participating in. Chapter 2, *Sustainability, Outreach, and Environmental Justice,* Section 2.52, provides an overview of measures Massport takes to avoid, minimize, and offset the environmental effects of airport operations. In addition, an Environmental Justice (EJ) and Public Health Existing Conditions Review has been included in the *2022 ESPR* to assess the existing environmental and health conditions currently experienced by the Airport's surrounding communities, including EJ communities. See Chapter 2, *Sustainability, Outreach, and Environmental Justice*, Section 2.4 and Section 2.5. The assessed conditions are derived from regional sources and are not associated with one specific entity or activity.
4-12	Staci Rubin, Conservation Law Foundation	Air Quality and Emissions Reduction	Provide a more detailed update on the Tufts and Boston University Ultrafine Particulate (UFP) study and associated findings. EEA notes that the EDR should "provide an update on the status and finding of UFP research being performed by Tufts University and Boston University regarding the identification of airport-specific related UFPs in an urban environment. The *2020/2021 EDR* notes Massport's cooperation and data sharing in regard to the study but does not provide additional details on study findings or relevance to Massport activities.	As part ASCENT, Massport is supporting Boston University research effort to assess Community Measurements of Aviation Emission Contributions to Ambient Air Quality. The primary goal of this project was to conduct a new air pollution monitoring campaign beneath flight paths to and from Logan Airport, using a protocol specifically designed to determine the magnitude and spatial distribution of UFPs in the vicinity of arrival flight paths. Data were collected to assess whether aircraft emissions, particularly arrival emissions, significantly contribute to UFPs concentrations at appreciable distances from the airport. For additional information refer to: https://s3.wp.wsu.edu/uploads/sites/2479/2022/10/ASCENT-Project-018-2021-Annual-Report.pdf

#	Author	Topic	Comment	Response
4-13	Staci Rubin, Conservation Law Foundation	Mitigation	While Massport states that they are on track to meet the goals of the Massport-CLF agreement, it is difficult to confirm this based on the information in the EDR. Massport must prioritize mitigation efforts that support increasing HOV mode share and be transparent about this reporting in the forthcoming *2022 ESPR*.	Prior to the COVID-19 pandemic, Massport was aggressively moving forward with new and expanded HOV services including expansion of Logan Express service hours, facility enhancements and expansion of the Logan Express Framingham Garage. In late 2019, Massport also purchased new buses for the planned new urban North Station to Logan Airport Express Service. As with many planned HOV enhancements prior to the COVID-19 outbreak, those services were suspended, reduced or deferred based on ridership demand. As passenger activity recovers, Massport restores service and restarts select postponed projects. Updates on projects deferred due to the COVID-19 pandemic are as follows: • Postponed Terminal E Improvement Phases 1 and 2: Terminal E Phase 1 opened in October 2023, and the next phase to add four new gates is currently in conceptual planning process. • Postponed Parking Garage in front of Terminal E: The project has resumed and currently in preliminary design phases. • Suspended Logan Express service from Peabody, Woburn, and Back Bay: Services restored in 2022. • Logan Express headways reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and new Quincy lot is helping to increase passenger capacity at Braintree as well as a parking expansion at Framingham, which is also helping to improve passenger use. • Postponed construction of additional parking at Framingham Logan Express: Project has resumed and is in the design phase with construction currently estimated to begin in 2024. • New Logan Express suburban location: Peabody Logan Express at new North Shore location opened in 2022 and planning for relocation to a new/enhances site in Danvers is underway for a planned late 2024 opening. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing Back Bay Logan Express. • Dedicated High Occupancy Vehicle (HOV) bus lanes: HOV prioritization initiatives, including HOV bus lanes, are underway throughout the Logan Airport campus. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 discusses the status and approach of deferred capital projects. Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity levels increase. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line.

#	Author	Topic	Comment	Response
4-14	Staci Rubin, Conservation Law Foundation	Mitigation	Notwithstanding, there are still several initiatives that remain deferred without clear guidelines or goals for when they will resume. We list these in the table below. We recommend that Massport develop transparent thresholds of the appropriate metric (e.g., VMT, operations, passenger activity, etc.) for when Massport will return to the implementation of these projects, or at least clarify decision-making processes for returning to these mitigation measures. Table 1 (Abbreviated) Key Deferred Mitigation Projects 1. Airport Ground Transportation and Parking Projects/Planning Concepts (Logan Airport Parking Project [additional 5,000 spaces]) 2. Suburban Logan Express Enhancement (Add about 1,000 additional spaces to the Framingham garage) 3. Suburban Logan Express Enhancement (Evaluate new Logan Express suburban locations, with a plan to open at least one new site) 4. Airport Ground Transportation and Parking Projects/Planning Concepts (Terminal E Modernization [incorporates former West Concourse Project] Blue Line Pedestrian Connection) 5. Urban Logan Express Service (Massport's plan to operate a new urban Logan Express location between North Station and Logan Airport is currently on-hold [although Massport procured buses for this service in 2020]) 6. Other (Several options were identified to reduce on-Airport congestion and improve on-Airport ground access efficiency. Initial options included dedicated HOV bus lanes, the creation of an intermodal transportation center with bus service to terminals, the construction of an Automated People Mover (APM), or some	As passenger activity recovers, and impacts from those additional activities grow, Massport restores service and restarts select postponed projects. Updates on projects deferred due to the COVID-19 pandemic are as follows: • Postponed Terminal E Improvement Phases 1 and 2: Terminal E Phase 1 opened in October 2023, and the next phase to add four new gates is currently in conceptual planning process. • Postponed Parking Garage in front of Terminal E: The project has resumed and currently in preliminary design phases. • Suspended Logan Express service from Peabody, Woburn, and Back Bay: Services restored in 2022. • Logan Express headways reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and new Quincy lot is helping to increase passenger capacity at Braintree as well as a parking expansion at Framingham, which is also helping to improve passenger use. • Postponed construction of additional parking at Framingham Logan Express: Project has resumed and is in the design phase with construction currently estimated to begin in 2024. • New Logan Express suburban location: Peabody Logan Express at new North Shore location opened in 2022 and planning for relocation to a new/enhances site in Danvers is underway for a planned late 2024 opening. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing Back Bay Logan Express. • Dedicated High Occupancy Vehicle (HOV) bus lanes: HOV prioritization initiatives, including HOV bus lanes, are underway throughout the Logan Airport campus. Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2 discusses the status and approach of deferred capital projects. Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity levels increase. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line

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			combination of these improvements. These and other options are currently on hold and will be revisited once passenger levels recover closer to 2019 levels)	
4-15	Staci Rubin, Conservation Law Foundation	Content, Scope, EJ, Climate	Continue to engage with affected communities to discuss mitigation opportunities.	Massport has and will continue to enhance public engagement as part of preparing the ESPR and future EDRs. To date, three additional meetings have been convened with the Executive Office of Energy and Environmental Affairs (EEA) and stakeholders regarding the format of the ESPR to develop strategies to improve readability for the general public. The first public information session on June 29, 2023, described the methodologies employed in the ESPR to develop future forecasts and technical approaches to modeling. A second session on December 12, 2023, with community advocacy group representatives and the EEA focused on review of *2020/2021 EDR* comments and discussed ways to better address these comments in the *2022 ESPR*. On January 17, 2024, a public information meeting provided an update on the ESPR preparation and findings. A fourth public information session will be held after the ESPR is filed with the MEPA Office during the public review period. Broad notification of these meetings is facilitated through notices in multiple languages in newspapers, distribution to community-based organizations (CBOs) and tribes on the EEA's EJ Reference List, previous reviewers, public libraries, Massport CAC and key community repositories.
4-16	Staci Rubin, Conservation Law Foundation	Content, Scope, EJ, Climate	Work with organizations and members from the most affected communities prior to the release of the next iteration of the report.	In addition to the public information meetings and extended comment period for the *2022 ESPR* (see Response to Comment 4-5), Massport will continue to meet with the Massport CAC and other community groups-on a regular basis. Projects going through the environmental review process also include public meetings during project scoping and ENF phases as well as other permit agency hearings, as appropriate.
4-17	Staci Rubin, Conservation Law Foundation	Content, Scope, EJ, Climate	Hold community meetings, outside of MEPA processes and after MEPA deadlines expire, to discuss ways for Massport to be a great neighbor and best implement mitigation measures associated with its environmental impacts, which are especially important as we live through the next phase of the COVID-19 pandemic.	In addition to the public information meetings and extended comment period for the ESPR (see Response to Comment 4-5), Massport will continue to meet with the Massport CAC and other community groups-on a regular basis. Projects going through the environmental review process also include public meetings during project scoping and ENF phases as well as other permit agency hearings, as appropriate.

#	Author	Topic	Comment	Response
5.	**Friends of the Mary Ellen Welch Greenway; Karen Maddelana**			
5-1	Karen Maddelana, Friends of the Mary Ellen Welch Greenway	Air Quality and Emissions Reduction	Provide more detailed information about the impact methodology in regard to the impact along the Mary Ellen Welch Greenway. For example, what are the expected air quality metrics along the Greenway?	The Environmental Status and Planning Report (ESPR) conducts air emission inventories though modeling of airport related emission sources for criteria pollutants under the National Ambient Air Quality Standards (NAAQS) and for greenhouse gases (GHG). The modeling does not assess impacts at a specific location or area such as the Greenway. However, the Massachusetts Department of Environmental Protection (MassDEP) and the United States Environmental Protection Agency (U.S.EPA) maintain a network of air quality monitors around the state to measure ambient air quality. Appendix J, *Air Quality and Greenhouse Gas Emissions Supporting Documentation*, Figure J-5, illustrates the locations of these monitors. Massport continues to work with the Federal Aviation Administration (FAA) and research institutions like MIT, Boston University, and Tufts University to expand research including on ultrafine particles (UFP) and black carbon (BC). Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5 provides an update on Massport's on-going collaboration and evolving service strategy with the Massachusetts Department of Public Health (MassDPH) and the East Boston Neighborhood Health Center (EBNHC). Studies include those described below.
5-2	Karen Maddelana, Friends of the Mary Ellen Welch Greenway	Ground Access	As the airport continues to grow, we would like to see it address an increase in traffic on 1A. We are highly interested in the locations with the most traffic volume along the Greenway, particularly on the Martin A. Coughlin Bypass Road.	Massport assesses traffic data and forecasted levels within the Logan Airport campus roadways. Individual projects that go through the MEPA process identify and mitigate traffic impacts as needed. Massport is committed to alleviating burden on surrounding communities and has a robust and evolving ground access and HOV program that aims to reduce traffic on surrounding roadways, including Route 1A. Massport works closely with the Massachusetts Department of Transportation (MassDOT) and the Massachusetts State Police on managing traffic and congestion on the roadways/tunnels providing access to Logan Airport. The Coughlin Bypass was constructed by Massport and has been effective in shifting airport and Silver Line traffic out of Day Square and other local roads. These collaborative efforts to reduce congestion on local roadways will continue.

#	Author	Topic	Comment	Response
5-3	Karen Maddelana, Friends of the Mary Ellen Welch Greenway	Noise Air Quality and Emissions Reductions	Add key updates to the ESPR 2017 iteration of Logan's unique MEPA review process: 1. The relevant scientific research on health impacts of aviation noise and pollution	Since 2019, Massport has supported an MIT study on aircraft noise abatement procedures modeling and validation through the FAA-affiliated Center of Excellence for Alternative Jet Fuels and Environment, also known as the Aviation Sustainability Center (ASCENT). The study's intent was to validate advanced approach and departure noise modeling techniques as well as to develop new noise abatement procedures. Information on the study, its findings, and associated annual reports are published here: https://ascent.aero/project/aircraft-noise-abatement-procedure-modeling-and-validation/. Chapter 7, *Noise*, Section 7.4. and Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5 Since 2015, Massport has also supported research conducted by MIT and Pennsylvania State University, which involved a noise study that evaluated a new analytical approach to quantifying noise from advanced operational procedures. To better understand the noise environment, project objectives were to develop a method for improving the fidelity, accuracy, and utility of noise analysis techniques for the development and environmental review of advanced operational procedures. Aircraft noise is generated through a combination of engine and aerodynamic sources. Traditional noise analysis techniques such as the Aviation Environmental Design Tool (AEDT) model noise using a Noise Power Distance method, which does not fully capture aerodynamic and velocity effects. Information on this study is available on ASCENT's website: https://ascent.aero/project/analytical-approach-for-quantifying-noise-from-advanced-operational-procedures/
5-4	Karen Maddelana, Friends of the Mary Ellen Welch Greenway	Mitigation	Add key updates to the ESPR 2017 iteration of Logan's unique MEPA review process: 2. Additional strategies to keep mitigation on pace with growth	As passenger activity recovers from COVID-19, Massport is restoring service and restarting select postponed projects, and projects are prioritized based on passenger needs and user demand. Updates on projects deferred due to COVID are discussed in Chapter 4, *Airport Planning*, Section 4.1 and Section 4.2, and are summarized as follows: • Postponed Terminal E Improvement Phases 1 and 2: Terminal E Phase 1 opened in October 2023, and the next phase to add four new gates is currently in conceptual planning process. • Postponed Parking Garage in front of Terminal E: Permitted for up to an additional 5,000 spaces, the project has resumed and currently in preliminary design phases. • Suspended Logan Express service from Peabody, Woburn, and Back Bay: Services restored in 2022. • Logan Express headways reduced from Braintree and Framingham Logan Express: Headways were restored in 2021, and New Quincy lot is helping to increase passenger capacity at Braintree as well as a parking expansion at

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				Framingham, which is also helping to improve passenger use. • Postponed construction of additional parking at Framingham Logan Express: Project has resumed and is in the design phase with construction currently estimated to begin in 2024. • New Logan Express suburban location: Peabody Logan Express at new North Shore location opened in 2022. Current priority initiatives include improvements to Wonderland employee parking, better service offerings for Silver Line 1, and enhancing Back Bay Logan Express. Danvers Logan Express is expected to open towards the end of 2024. • Dedicated High Occupancy Vehicle (HOV) bus lanes: HOV prioritization initiatives, including HOV bus lanes, are underway throughout Logan Airport campus. Planned mitigation measures for specific projects at Logan Airport are detailed in Chapter 10, *Project Mitigation*, and will continue to be refined as growth and activity levels increase. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line. Future EDRs and ESPRs will continue to provide regular updates on operational and environmental impacts and Massport's strategies to minimize environmental and community impacts as projects come on-line. Massport is currently updating its *Sustainability and Resiliency Design Standards and Guidelines* (SRDSGs) and construction sustainability guidelines to align with the *Roadmap to Net Zero by 2031* and improve its proactive measures that respond to potential impacts that could result from future developments. Responses to Comments 1-1 and 1-10 provide additional details on some of these improvements. The results of the *2022 Logan Airport Air Passenger Ground-Access Survey* informed the HOV, and ground access strategy as described in Chapter 6, *Ground Access,* Section 6.5. This strategy is being evaluated on an on-going basis to adapt to the changes associated with the pandemic and the resultant passenger demands for airport access. As part of the *2022 ESPR*, Massport also conducted an idling and dwell time study to update the vehicle dwell time information for the Terminal A arrivals and departure curbs (all modes) and Terminal B buses. The study provided updated data used to complete the ground access and air quality modeling of current and future forecasted conditions for the *2022 ESPR*, and this information was integrated into discussions on anticipated future growth and plans to accommodate growth in applicable chapter sections. Chapter 7, *Noise*, Section 7.4. and Chapter 8, *Air Quality and Greenhouse Gas Emissions*, Section 8.5 discuss air and noise strategies to extend past project-specific mitigation and provide additional impact offset strategies and initiatives.

#	Author	Topic	Comment	Response
5-5	Karen Maddelana, Friends of the Mary Ellen Welch Greenway	Air Quality and Emissions Reduction	Add key updates to the ESPR 2017 iteration of Logan's unique MEPA review process: 3. Strategies for the most effective distribution of air filtration units	Massport has renewed an agreement to provide funding to the EBNHC to help expand the efforts of their Asthma and COPD Prevention and Treatment Program in East Boston and Winthrop that provides services including screenings for children, distribution of asthma kits, and home visits. When discussing with the EBNHC regarding installation of HEPA filters in home and other locations, representatives of the Center stated that home visits would be a more effective tool than filters. Accordingly, Massport is funding the home visit program.

C. Proposed Scope for the 2023/2024 EDR

PROJECT NAME: Logan Airport 2023/2024 Environmental Data Report (EDR)

PROJECT LOCATION: Boston Logan International Airport, East Boston, Massachusetts

EEA NUMBER: 3247

PROPONENT: Massachusetts Port Authority (Massport)

Massport respectfully submits this proposed scope for the Logan Airport *2023/2024 Environmental Data Report* (*2023/2024 EDR*) for public review and comment. To enhance the timeliness of reporting on environmental conditions at Logan Airport, the next EDR will be a combined *2023/2024 EDR*. The *2023/2024 EDR* would follow the *2022 ESPR*, which was filed in May 2024. As directed by the Secretary of the Executive Office of Energy and Environmental Affairs (EEA), Massport will continue to use this process to evaluate the cumulative impacts associated with Logan Airport activities through preparation of an Environmental Status and Planning Report (ESPR) approximately every five years with interim data updates through the EDRs.

To enhance the readability EDRs, future EDRs will take the form of short annual updates on the pertinent findings from the reporting year, limiting narrative wherever possible. Supporting technical information will be provided in appendices, as appropriate. Future ESPRs will provide narrative on trends and findings for the reporting year, comparisons to previous years, and a future look ahead with an updated activity forecast.

Massport will continue to post the full EDR/ESPR documents on the Massport website: https://www.massport.com/environment/project-environmental-filings/boston-logan.

C.1 Purpose of the Logan Airport *ESPRs and EDRs*

For nearly four decades, the Logan Airport EDRs and ESPRs, and the former Generic Environmental Impact Report (GEIR) with Annual Updates, provided information to agencies and the public on planning activities, aircraft operations and passenger activity levels, and Massport initiatives at Logan Airport.

The ESPR and EDR documents are part of a well-established, state-level environmental review process that is unique to Massport and assesses Logan Airport's cumulative environmental impacts. As in previous years, the EDR and ESPR processes will continue to be the forum to address cumulative impacts by providing the Airport-wide context for air quality, noise, ground transportation, and water quality.

- The EDR/ESPR process was developed by Massport and EEA to allow individual projects at Logan Airport to be considered and analyzed in the broader, Airport-wide context.
- The EDRs/ESPRs provide a planning context which complements the individual project-specific filings. The process provides a context against which individual projects at Logan Airport meeting state and federal environmental review thresholds are evaluated on a project-specific basis.
- The EDRs and ESPRs will continue to serve as the baseline analyses for project-specific environmental reviews and provide a forum for updates on Massport's planning efforts and mitigation programs.
- EDRs are filed in the years between ESPRs, and are retrospective documents generally filed annually that discuss environmental impacts for the reporting year or years.

Through these EDR and ESPRs, Logan Airport is subject to comprehensive and regular MEPA review, including opportunities for public comment on cumulative impacts from all aspects of airport operations. This regular and long-standing updating and reporting on planning and cumulative impacts is unique among state agencies subject to MEPA jurisdiction. It reflects the challenge and complexity of managing and modernizing Logan Airport within a dense, urban area including many Environmental Justice populations.

EDRs and ESPRs help set the planning context for subsequent Massachusetts Environmental Policy Act (MEPA) reviews of Environmental Notification Forms (ENFs) and, if necessary, Environmental Impacts Reports (EIRs). In this manner, Massport ensures that there is no segmentation of project review for projects at Logan Airport. The EDRs and ESPRs also provide context for the National Environmental Policy Act (NEPA) reviews by the Federal Aviation Administration (FAA) serving as the lead federal agency.

Massport will continue to look for opportunities to improve the readability of the documents for the general public and strive to reduce the size of the documents.

C.2 Contents of the *2023/2024 EDR*

The *2023/2024 EDR* will provide an update on conditions at Logan Airport for calendar years 2023 and 2024. The EDR will continue to serve as a background and context against which individual projects at Logan Airport can be evaluated. It also will report on the cumulative effects of Logan Airport operations and activities, compared to previous years, as appropriate. As noted in the Secretary's Certificate on the *2020/2021 EDR* and subsequent feedback from the MEPA Office, the *2023/2024 EDR* will provide information on the Environmental Justice (EJ) populations in proximity to the Airport, and summarize readily available information on community public health status.

C.2.1 Format of the 2023/2024 EDR

The *2023/2024 EDR* will be prepared in a new, short format that will focus on key findings, employ use of infographics and tables where possible, and reduce narrative. The appendices will include supporting technical information primarily in table format.

The technical studies in the *2023/2024 EDR* will include reporting on and analysis of key indicators of sustainability, EJ, and community outreach, airport activity levels, project planning, the regional transportation system, ground access, noise, air quality, water quality and environmental management, and project mitigation tracking. Each chapter's contents are described below.

C.2.2 Executive Summary

Chapter of *2023/2024 EDR* will include:

- Highlights of 2023/2024 planning and environmental conditions
- Overview of Logan Airport context
- Overview of the EDR/ESPR cycle
- Description of the analysis framework for the environmental reporting and technical studies
- Highlights of passenger activity levels and aircraft operations
- Overview of EJ, community outreach and sustainability initiatives
- Overview of the Logan Airport planning initiatives and projects
- Overview of the regional intermodal transportation system
- Ground transportation, noise, air quality and greenhouse gases, and water quality 2023/2024 status
- Status of project-related mitigation
- Translated versions of the Executive Summary for the *2023/2024 EDR* will be prepared and links provided. Translated languages will be identified through the EEA EJ tool.

C.2.3 Introduction

Chapter of the *2023/2024 EDR* will include:

- Overview of contents of *2023/2024 EDR*
- User guide to the *2023/2024 EDR*

C.2.4 Sustainability, Outreach, and Environmental Justice

Chapter will report on the *2023/2024* status of:

- Massport's sustainability and net zero greenhouse gas (GHG) emissions reduction initiatives
- Community outreach activities in 2023 and 2024
- Update on public health studies undertaken by others

C.2.5 Activity Levels

Chapter will provide a snapshot of airport activity levels for 2023/2024 comparing to historic and previous year for:

- Domestic and international passenger activity levels
- Aircraft operations including fleet mix and scheduled airline services at Logan Airport
- Cargo and mail volumes

C.2.6 Airport Planning

Chapter will describe the status of planning initiatives for:

- Ground Transportation and Parking
- Logan Airport Terminal Area
- Logan Airport Airside Areas
- Logan Airport Service Areas
- Airport Buffers and Open Space

C.2.7 Regional Transportation

Chapter will report on Logan Airport's 2023/2024 role in the region's intermodal transportation system:

- Regional airport operations and passenger activity levels
- Massport's coordination with other transportation agencies
- Metropolitan and regional rail initiatives and ridership

C.2.8 Ground Access to and from Logan Airport

Chapter will report on 2023/2024 ground access metrics and conditions:

- Logan Airport gateway volumes
- On-Airport traffic volumes and vehicle miles traveled (VMT)
- Multimodal transportation ridership, including high-occupancy vehicle (HOV), MBTA, and other modes as well as HOV mode share, from the most recent Logan Airport passenger survey
- Parking demand and management, and compliance with the Logan Airport Parking Freeze
- Trends of RideApp companies, such as Uber™ and Lyft™
- Efforts to reduce single occupancy vehicle, or deadhead, trips to the Airport
- Update on long-range ground access management strategy planning

C.2.9 Noise

Chapter will describe 2023/2024 noise conditions:

- Noise context
- Noise model and required inputs such as fleet mix, various aircraft Stage classifications, daily and nighttime operations, runway use, flight tracks, and meteorological data
- Modeled noise levels including annual noise contours and estimated noise-impacted populations
- Measured versus modeled noise values
- Supplemental metrics including Cumulative Noise Index (CNI), Times-Above for 65, 75, and 85 A-weighted decibel (dBA) threshold values, and dwell and persistence analysis
- Noise abatement efforts
- Massport role in noise-related research efforts by others

C.2.10 Air Quality/GHG

Chapter will describe air quality and GHG conditions for 2023/2024:

- Sources of emissions including aircraft, ground service equipment, motor vehicles, and stationary sources
- Modeled Emissions inventories for carbon monoxide (CO), oxides of nitrogen (NOx), volatile organic compounds (VOCs), and particulate matter (PM)
- Modeled inventory of GHG emissions as a voluntary study
- Massport's air emission and GHG emissions reduction strategy
- Status of ultrafine particle studies
- Discussion on national and international efforts to decrease air emissions

C.2.11 Water Quality and Environmental Management

Chapter will report on 2023/2024 Logan Airport environmental regulatory compliance:

- National Pollutant Discharge Elimination System (NPDES) Permit and monitoring results for Logan Airport's outfalls and the Fire Training Facility
- Jet fuel usage and spills and fuel spill prevention
- Massachusetts Contingency Plan (MCP) activities
- Tank management program
- Update on the Environmental Management Plan

C.2.12 Project-Specific Mitigation Tracking

Chapter will document the status of mitigation commitments for specific Massport and tenant projects at Logan Airport that have undergone MEPA review and have Section 61 Findings:

- West Garage/Central Garage (EEA 9790)
- International Gateway (EEA 9791)
- Logan Airside Improvements Planning Project (EEA 10458)
- Terminal A Replacement Project (EEA 12096)
- Southwest Service Area Redevelopment Program/Rental Car Center (EEA 14137)
- Logan Runway Safety Area Improvements Project (EEA 14442)
- Logan Airport Parking Project (EEA 15655)
- Terminal E Modernization Project (EEA 15434)
- Runway 27 Runway Safety Improvements (EEA 16433)

C.2.13 Appendices

C.2.13.1 MEPA Documentation

Appendices will include a copy of the Secretary's Certificate and comment letters received on the *2022 ESPR*. Individual responses will be prepared for items the Secretary's Certificate on the *2022 ESPR* and comments in reviewers' letters will be provided.

Distribution list including the environmental justice community for the *2023/2024 EDR* indicating those receiving printed documents or Notices of Availability with links to the online version of the EDR will be provided. Massport will also provide printed copies to community libraries and other upon request.

C.2.13.2 Supporting Technical Documentation

Supporting technical appendices will be provided as necessary for the technical chapters.

D. Distribution

This *2022 Environmental Status and Planning Report (ESPR)* has been distributed to federal, state, and city agencies and to parties listed in this appendix. The list includes those entities that the Massachusetts Environmental Policy Act (MEPA) requires as part of the review of the document, representatives of governmental agencies, commenters on the *2020/2021 Environmental Data Report (EDR)*, and community groups interested in Airport activities. **The 'E' indicates that Massport sent an electronic copy via email, the 'N' indicates that Massport sent a Notice of Availability, and the 'P' indicates that Massport sent a printed copy.** Commenters on the *2020/2021 EDR* are indicated with an asterisk (*).

The *2022 ESPR* is also available on Massport's website at www.massport.com. Limited printed copies of the *2022 ESPR* may be requested from Brad Washburn at (617) 568-3546, or community@massport.com. Printed copies of this report are available for review at the following public libraries:

Library		Address	Library		Address
P	Boston Public Library Main Branch Attn. Anna Fahey-Flynn	700 Boylston Street Boston, MA 02116	N	Boston Public Library Brighton Branch	40 Academy Hill Road Brighton, MA 02135
N	Boston Public Library Charlestown Branch	179 Main Street Charlestown, MA 02129	N	Boston Public Library Chinatown Branch	2 Boylston Street Boston, MA 02116
P	Boston Public Library Connolly Branch	433 Centre Street Jamaica Plain, MA 02130	P	Boston Public Library Dorchester Branch	690 Adams Street Dorchester, MA 02122
P	Boston Public Library East Boston Branch	365 Bremen Street East Boston, MA 02128	N	Boston Public Library Egleston Square Branch	2044 Columbus Avenue Roxbury, MA 02119
P	Boston Public Library Fields Corner Branch	1520 Dorchester Avenue Dorchester, MA 02122	N	Boston Public Library Grove Hall Branch	41 Geneva Avenue Dorchester, MA 02121
N	Boston Public Library Honan-Allston Branch	300 North Harvard Street, Allston, MA 02134	N	Boston Public Library Hyde Park Branch	35 Harvard Avenue Hyde Park, MA 02136
N	Boston Public Library Jamaica Plain Branch	30 South Street Jamaica Plain, MA 02130	N	Boston Public Library Codman Square Branch	690 Washington Street Dorchester, MA 02124
N	Boston Public Library Lower Mills Branch	27 Richmond Street Dorchester, MA 02124	P	Boston Public Library Mattapan Branch	1350 Blue Hill Avenue Mattapan, MA 02126
N	Boston Public Library North End Branch	25 Parmenter Street Boston, MA 02113	N	Boston Public Library Parker Hill Branch	1497 Tremont Street Roxbury, MA 02120
N	Boston Public Library Roslindale Branch	4246 Washington Street Roslindale, MA 02131	P	Boston Public Library Roxbury Branch	149 Dudley Street Roxbury, MA 02119

	Library (*continued*)	Address		Library (*continued*)	Address
P	Boston Public Library South Boston Branch	646 East Broadway South Boston, MA 02127	N	Boston Public Library West End Branch	151 Cambridge Street Boston, MA 02114
P	Boston Public Library Uphams Corner Branch	500 Columbia Road Dorchester, MA 02125	P	Winthrop Public Library and Museum	2 Metcalf Square Winthrop, MA 02152
P	Bedford Free Public Library	7 Mudge Way Bedford, MA 01730	P	Cambridge Public Library Main Library	449 Broadway Cambridge, MA 02138
P	Cary Memorial Library (Lexington Public Library)	1874 Massachusetts Avenue Lexington, MA 02420	P	Chelsea Public Library	569 Broadway Chelsea, MA 02150
P	Concord Free Public Library	129 Main Street Concord, MA 01742	P	Parlin Memorial Library (Everett Public Library)	410 Broadway Everett, MA 02149
P	Lincoln Public Library	3 Bedford Road Lincoln, MA 01773	N	Malden Public Library	36 Salem Street Malden, MA 02148
P	Charlotte and William Bloomberg Medford Public Library	111 High Street Medford, MA 02155	P	Milton Public Library Main Branch	476 Canton Avenue Milton, MA 02186
P	Thomas Crane Public Library (Quincy Public Library)	40 Washington Street Quincy, MA 02169	P	Revere Public Library	179 Beach Street Revere, MA 02151
N	Robbins Library (Arlington Public Library)	700 Massachusetts Avenue Arlington, MA 02476	P	Somerville Public Library Central Branch	79 Highland Avenue Somerville, MA 02143

Federal Government

United States Senators and Representatives

N	The Honorable Edward J. Markey U.S. Senate Attn: Katherine Morfill 975 JFK Federal Building 15 New Sudbury Street Boston, MA 02203	N	The Honorable Elizabeth Warren U.S. Senate Attn: Olivia Paulo 2400 JFK Federal Building 15 New Sudbury Street Boston, MA 02203	N	The Honorable William R. Keating U.S. House of Representatives Attn: Mike Jackman 50 Resnik Road, Suite 103 Plymouth, MA 02360
N	The Honorable Jake Auchincloss U.S. House of Representatives 29 Crafts Street, Suite 375 Newton, MA 02458	N	The Honorable Katherine Clark U.S. House of Representatives Attn: Kelsey Perkins 157 Pleasant Street, Suite 4 Malden, MA 02148	N	The Honorable Seth Moulton U.S. House of Representatives Attn: Rick Jakious 21 Front Street Salem, MA 01970
N	The Honorable Stephen F. Lynch U.S. House of Representatives Attn: Nicholas Zaferakis 1 Harbor Street, Suite 101 Boston, MA 02210	N	The Honorable James P. McGovern U.S. House of Representatives Attn: Kelly Brissette 12 East Worcester Street, Suite 1 Worcester, MA 01604	N	The Honorable Lori Trahan U.S. House of Representatives Attn: Alexander Eliasen 126 John Street, Suite 12 Lowell, MA 01852

Federal Government (*continued*)					
N	The Honorable Richard E. Neal U.S. House of Representatives 300 State Street, Suite 200 Springfield MA, 01105	N	The Honorable Ayanna Pressley Attn: Eric White U.S. House of Representatives 1295 River Street Hyde Park, MA 21236		
Environmental Protection Agency (U.S.EPA)					
N	Amanda Triebwasser, Lead Program Administrator U.S. Environmental Protection Agency, Region 1 5 Post Office Square, Suite 100 Boston, MA 02109	N	David Cash, Regional Administrator U.S. Environmental Protection Agency, Region 1 5 Post Office Square, Suite 100 Boston, MA 02109-3912	N	Karen McGuire Deputy Regional Administrator U.S. Environmental Protection Agency, Region 1 5 Post Office Square, Suite 100 Boston, MA 02109-3912
Federal Aviation Administration (FAA)					
N	Colleen D'Alessandro New England Regional Administrator, U.S. Department of Transportation FAA, New England Region 1200 District Avenue Burlington, MA 01803	N	Luke Garrison, Director U.S. Department of Transportation, FAA, New England Region, Airports Division 1200 District Avenue Burlington, MA 01803	N	Lisa Lesperance Lead Community Planner, U.S. Department of Transportation, FAA, New England Region, Airports Division 1200 District Avenue Burlington, MA 01803
N	Cheryl Quaine Environmental Protection Specialist, U.S. Department of Transportation FAA, New England Region, Airports Division 1200 District Avenue Burlington, MA 01803	P	Chris Quigley, Tower Manager U.S. Department of Transportation, FAA, Logan International Airport 600 Control Tower, 19th Floor East Boston, MA 02128		
United States Army Corps of Engineers (U.S.ACE)		**United States Fish and Wildlife Service (U.S.FWS)**			
N	Colonel Justin R. Pabis, Commander and District Engineer, U.S. Army Corps of Engineers, New England District 696 Virginia Road Concord, MA 01742	N	Wendi Weber, Regional Director, Northeast Region U.S. Department of the Interior Fish and Wildlife Service 300 Westgate Center Drive Hadley, MA 01035	N	New England Ecological Services Field Office U.S. Department of the Interior Fish and Wildlife Service 70 Commercial Street, Suite 300 Concord, NH 03301
State Government					
Massachusetts State Senators and Representatives					
N	Senator Nick Collins Massachusetts State House 24 Beacon Street, Room 312-E Boston, MA 02133	N	Senator Brendan P. Crighton Chairperson, Joint Committee on Transportation Massachusetts State House 24 Beacon Street, Room 109-C Boston, MA 02133	N	Senator Sal DiDomenico Assistant Majority Leader Massachusetts State House 24 Beacon Street, Room 405 Boston, MA 02133

State Government (*continued*)					
Massachusetts State Senators and Representatives (*continued*)					
N	Senator Lydia Edwards Massachusetts State House 24 Beacon Street, Room 413-C Boston, MA 02133	N	Senator Paul Mark Vice Chair, Joint Committee on Transportation Massachusetts State House 24 Beacon Street, Room 109-C Boston, MA 02133	N	Senator Karen E. Spilka Senate President Massachusetts State House 24 Beacon Street, Room 332 Boston, MA 02133
N	Representative David Biele Massachusetts State House 24 Beacon Street, Room 443 Boston, MA 02133	N	Representative Jessica Ann Giannino Massachusetts State House 24 Beacon Street, Room 146 Boston, MA 02133	N	Representative Adrian C. Madaro Massachusetts State House 24 Beacon Street, Room 33 Boston, MA 02133
N	Representative Ronald Mariano Speaker of the House Massachusetts State House 24 Beacon Street, Room 356 Boston, MA 02133	N	Representative Brian W. Murray Vice Chair, Joint Committee on Transportation Massachusetts State House 24 Beacon Street, Room 134 Boston, MA 02133	N	Representative Daniel J. Ryan Massachusetts State House 24 Beacon Street, Room 443 Boston, MA 02133
N	Representative William M. Straus Chairperson, Joint Committee on Transportation Massachusetts State House 24 Beacon Street, Room 134 Boston, MA 02133				
Executive Office of Energy and Environmental Affairs (EEA)					
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E	Massachusetts Environmental Policy Act Office 100 Cambridge Street, Suite 900 Boston, MA 02114 MEPA@mass.gov				

State Government (*continued*)					
Department of Environmental Protection (MassDEP)					
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N	Glenn Keith, Director, Air and Climate Programs Department of Environmental Protection 100 Cambridge Street, Suite 900 Boston, MA 02114	N	Sharon Weber, Deputy Division Director, Air and Climate Programs, Department of Environmental Protection 100 Cambridge Street, Suite 900 Boston, MA 02114	N	Lisa Rhodes, Director Wetlands Program Chief Department of Environmental Protection 100 Cambridge Street, Suite 900 Boston, MA 02114
Department of Public Health (MassDPH)		**Department of Conservation and Recreation (DCR)**			
E	Nalina Narain, Director Department of Public Health, Bureau of Climate and Environmental Health 250 Washington Street, 7th Floor Boston, MA 02115 dphtoxicology@massmail.state.ma.us	E	Department of Conservation and Recreation Attn: MEPA Coordinator 251 Causeway Street, Suite 600 Boston, MA 02114 andy.backman@mass.gov		
Metropolitan Area Planning Council (MAPC)					
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Massachusetts Water Resources Authority (MWRA)					
N	Frederick A. Laskey, Executive Director Massachusetts Water Resources Authority Deer Island 33 Tafts Avenue Boston, MA 02128	E	Hillary Monahan, MEPA Coordinator Massachusetts Water Resources Authority Deer Island 33 Tafts Avenue Boston, MA 02128 Hillary.Monahan@mwra.com		

State Government (*continued*)					
Office of Coastal Zone Management (CZM)		**Boston Region Metropolitan Planning Organization (BRMPO)**			
N	Patrice Bordonaro, Administrative Assistant Office of Coastal Z1 Management 251 Causeway Street, Suite 800 Boston, MA 02114 patrice.bordonaro@mass.gov	N	Gina Perille, Deputy Executive Director Boston Region Metropolitan Planning Organization, Central Transportation Planning Staff 10 Park Plaza, Room 2150 Boston, MA 02116	N	Tegin Teich, Executive Director Boston Region Metropolitan Planning Organization, Central Transportation Planning Staff 10 Park Plaza, Room 2150 Boston, MA 02116
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N	Monica Tibbit-Nutt, Secretary and CEO Department of Transportation 10 Park Plaza Boston, MA 02116	N	Jeffrey DeCarlo, Aeronautics Administrator Department of Transportation, Aeronautics Division Logan Office Center 1 Harborside Drive, Suite 205N East Boston, MA 02128	N	Samantha Dolabany, Deputy/Acting Director of Environmental Services Department of Transportation, Highway Division 10 Park Plaza, Suite 7130 Boston, MA 02116
N	Jonathan Gulliver, Highway Administrator Department of Transportation, Highway Division 10 Park Plaza Boston, MA 02116	N	David J. Mohler, Executive Director Department of Transportation, Office of Transportation Planning 10 Park Plaza Boston, MA 02116	E	Department of Transportation, Public/Private Development Unit 10 Park Plaza, Suite 4150 Boston, MA 02116 MassDOTPPDU@dot.state.ma.us
E	Michael Garrity, MEPA Coordinator Department of Transportation, District 6 185 Kneeland Street Boston, MA 02111 michael.garrity@dot.state.ma.us				
Massachusetts Bay Transportation Authority (MBTA)					
N	Phillip Eng, General Manager and CEO Massachusetts Bay Transportation Authority 10 Park Plaza, 6^{th} Floor Boston, MA 02116	N	Tess Paganelli, Director of Environmental Review and Permitting Massachusetts Bay Transportation Authority 10 Park Plaza Boston, MA 02116	E	Massachusetts Bay Transportation Authority Attn: MEPA Coordinator 10 Park Plaza, 6^{th} Floor Boston, MA 02116-3966 MEPAcoordinator@mbta.com

State Government (*continued*)					
Massachusetts Historical Commission (MHC)		**Massachusetts Executive Office of Health and Human Services**		**Executive Office of Public Safety and Security**	
P	Massachusetts Archives 220 Morrissey Boulevard Boston, MA 02125	N	Kate Walsh, Secretary, Executive Office of Health and Human Services 1 Ashburton Place Boston, MA 02108	N	Terrence Reidy, Secretary Executive Office of Public Safety and Security 1 Ashburton Place, Suite 2133 Boston, MA 02108
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Department of Energy Resources* (DOER)		**Executive Office of Housing and Livable Communities**			
E	Paul F. Ormond, Energy Efficiency Engineer Department of Energy Resources, Energy Efficiency Division 100 Cambridge Street, 9th Floor Boston, MA 02114 paul.ormond@mass.gov	N	Ed Augustus, Secretary Executive Office of Housing and Livable Communities 100 Cambridge Street, Suite 300 Boston, MA 02114		
Massachusetts Port Authority (Massport) Board of Directors					
N	Lewis Evangelidis Massport Board of Directors Massachusetts Port Authority 1 Harborside Drive East Boston, MA 02128	N	Warren Fields Massport Board of Directors Massachusetts Port Authority 1 Harborside Drive East Boston, MA 02128	P	Patricia Jacobs, Chair Massport Board of Directors Massachusetts Port Authority 1 Harborside Drive East Boston, MA 02128
N	John Nucci Massport Board of Directors Massachusetts Port Authority 1 Harborside Drive East Boston, MA 02128	N	Monica Tibbits-Nutt Massport Board of Directors Massachusetts Port Authority 1 Harborside Drive East Boston, MA 02128	N	Sean M. O'Brien Massport Board of Directors Massachusetts Port Authority 1 Harborside Drive East Boston, MA 02128
N	Laura Sen, Vice Chair Massport Board of Directors Massachusetts Port Authority 1 Harborside Drive East Boston, MA 02128				

<table>
<tr><td colspan="6">Municipalities</td></tr>
<tr><td colspan="6">City of Boston</td></tr>
<tr><td colspan="2">Office of the Mayor</td><td colspan="4">Boston Transportation Department (BTD)</td></tr>
<tr><td>N</td><td>Michelle Wu, Mayor
City of Boston
1 City Hall Square, Suite 500
Boston, MA 02201-2026</td><td>N</td><td>Jascha Franklin-Hodge, Chief of Streets
City of Boston Transportation Department
1 City Hall Square, Room 721
Boston, MA 02201-2026</td><td>P</td><td>Robert D'Amico, Senior Strategic Planner
City of Boston Transportation Department
1 City Hall Square, Room 721
Boston, MA 02201-2026</td></tr>
<tr><td colspan="4">Boston Planning & Development Agency (BPDA)</td><td colspan="2">Boston Neighborhood Services Department</td></tr>
<tr><td>N</td><td>James Arthur Jemison, Chief of Planning and Director of Boston Planning & Development Agency
Boston Planning & Development Agency
1 City Hall Square, 9th Floor
Boston, MA 02201</td><td>N</td><td>Lacey Rose, Chief Communications Officer
Boston Planning & Development Agency
1 City Hall Square, 9th Floor
Boston, MA 02201</td><td>N</td><td>Manuela Villa Gomez
East Boston Neighborhood Liaison
City of Boston Department of Neighborhood Services
1 City Hall Square, Room 805
Boston, MA 02201</td></tr>
<tr><td colspan="2">Boston Parks and Recreation Department</td><td colspan="2">City of Boston Clerk's Office</td><td colspan="2">Boston Public Health Commission</td></tr>
<tr><td>N</td><td>Ryan Woods, Commissioner
City of Boston Parks and Recreation Department
1010 Massachusetts Avenue, 3rd Floor
Boston, MA 02118</td><td>N</td><td>Alex Geourntas, City Clerk
1 City Hall Square, Room 601
Boston, MA 02201-2014</td><td>E</td><td>Boston Public Health Commission
1010 Massachusetts Avenue, 6th Floor
Boston, MA 02118
info@bphc.org</td></tr>
<tr><td colspan="2">Boston Environment, Energy, and Open Space Department</td><td colspan="2">Boston Conservation Commission</td><td colspan="2"></td></tr>
<tr><td>N</td><td>Rev. Mariama White-Hammond
Chief of Environment, Energy, and Open Space
City of Boston Environment, Energy, and Open Space Department
1 City Hall Square, Room 709
Boston, MA 02201</td><td>N</td><td>Boston Conservation Commission
1 City Hall Square, Room 709
Boston, MA 02201</td><td colspan="2"></td></tr>
<tr><td colspan="6">Boston Environment Department</td></tr>
<tr><td>N</td><td>Commissioner City of Boston Environment Department
1 City Hall Square, Room 709
Boston, MA 02201</td><td>N</td><td>Kat Eshel, Chief of Staff
City of Boston Environment Department
1 City Hall Square, Room 709
Boston, MA 02201</td><td>N</td><td>Maura Zlody, Senior Environmental Policy Analyst
City of Boston Environment Department
1 City Hall Square, Room 709
Boston, MA 02201</td></tr>
</table>

City of Boston (*continued*)					
Boston Water and Sewer Commission					
N	John Sullivan, Chief Engineer Boston Water and Sewer Commission 980 Harrison Avenue Boston, MA 02119	N	Adam Horst, Project Director Boston Water and Sewer Commission 980 Harrison Avenue Boston, MA 02119	N	Charlie Jewell, Director of Planning Boston Water and Sewer Commission 980 Harrison Avenue Boston, MA 02119
Boston City Council					
N	Ruthzee Louijeune, City Council President; Councilor-At-Large 1 City Hall Square, Suite 550 Boston, MA 02201	N	Julia Mejia, Councilor-At-Large 1 City Hall Square, Suite 550 Boston, MA 02201	N	Erin J, Murphy, Councilor-At-Large 1 City Hall Square, Suite 550 Boston, MA 02201
N	Henry Santana, Councilor-At-Large 1 City Hall Square, Suite 550 Boston, MA 02201	N	Gabriela Coletta, Councilor, District 1 1 City Hall Square, Suite 550 Boston, MA 02201	N	Edward M. Flynn, Councilor, District 2 1 City Hall Square, Suite 550 Boston, MA 02201
N	John Fitzgerald, Councilor, District 3 1 City Hall Square, Suite 550 Boston, MA 02201	N	Brian J. Worrell, Councilor, District 4 1 City Hall Square, Suite 550 Boston, MA 02201	N	Enrique J. Pepén, Councilor, District 5 1 City Hall Square, Suite 550 Boston, MA 02201
N	Benjamin J. Weber, Councilor, District 6 1 City Hall Square, Suite 550 Boston, MA 02201	N	Tania Fernandes Anderson, Councilor, District 7 1 City Hall Square, Suite 550 Boston, MA 02201	N	Sharon Durkan, Councilor, District 8 1 City Hall Square, Suite 550 Boston, MA 02201
N	Liz Beardon, Councilor, District 9 1 City Hall Square, Suite 550 Boston, MA 02201				
Town of Milton					
N	Milton Board of Selectmen 525 Canton Avenue Milton, MA 02186	N	Nicholas Milano, Town Administrator 525 Canton Avenue Milton, MA 02186		
City of Chelsea					
N	Fidel Maltez, City Manager Chelsea City Hall, Office #302 500 Broadway Chelsea, MA 02150	N	Clifford Cunningham, City Clerk Chelsea City Hall, Room #306 500 Broadway Chelsea, MA 02150	N	Giovanni A. Recupero, District 6 Councilor Chelsea City Hall 500 Broadway Chelsea, MA 02150

City of Chelsea (*continued*)					
N	Stephen Sarikas, Chelsea Conservation Commission Chelsea City Hall 500 Broadway Chelsea, MA 02150	N	Dr. Corinna Culler, Chair Board of Health Chelsea City hall 500 Broadway Chelsea, MA 02150	N	John DePriest, Director of Planning & Development City of Chelsea 500 Broadway Chelsea, MA 02150
City of Quincy					
N	Thomas P. Koch, Mayor Quincy City Hall 1305 Hancock Street Quincy, MA 02169	N	Nicole L. Crispo, City Clerk Quincy City Hall 1305 Hancock Street Quincy, MA 02169	N	Ian C. Cain, Council President; Councilor, Ward 3 Quincy City Council 93 Forbes Hill Road Quincy, MA 02170
N	James K. Devine, Councilor, Ward 4 Quincy City Council 117 Cross Street Quincy, MA 02169	N	Danile J. Minton, Councilor, Ward 5 Quincy City Council 16 Sims Road Quincy, MA 02169		
City of Revere					
N	Patrick M. Keefe, Jr., Mayor Revere City Hall 281 Broadway Revere, MA 02151	N	Ashley Melnik, City Clerk Revere City Hall 281 Broadway Revere, MA 02151		
Town of Winthrop					
N	Tony Marino, Town Manager Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152	N	Hannah Belcher, Chair Air Pollution, Noise, and Airport Hazards Committee Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152	N	Bill Schmidt, Chair Board of Health 45 Pauline Street, Floor 1 Winthrop, MA 02152
N	Christopher Boyce, Chair Winthrop Planning Board Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152	P	Jerome Falbo, Vice Chair Winthrop Board of Health 1 Metcalf Square Winthrop, MA 02152	N	James Letterie, Council President Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152
N	Rob DeMarco, Councilor-At-Large Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152	N	Richard Fucillo, Councilor, Precinct 1 Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152	N	John Munson, Councilor, Precinct 2 Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152
N	Hannah Belcher, Councilor, Precinct 3 Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152	N	Suzanne Swope, Councilor, Precinct 4 Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152	N	Joseph Aiello, Councilor, Precinct 5 Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152

Town of Winthrop (*continued*)					
N	John DaRos, Councilor, Precinct 6 Winthrop Town Hall 1 Metcalf Square Winthrop, MA 02152				
Town of Bedford					
N	Matthew J. Hanson, Town Manager Town of Bedford 10 Mudge Way Bedford, MA 01730	N	Shawn Hanegan, Chair Board of Selectmen Town of Bedford 10 Mudge Way Bedford, MA 01730	N	Emily Mitchell, Select Board Member; Representative Hanscom Field Advisory Commission Town of Bedford 10 Mudge Way Bedford, MA 01730
Town of Lexington					
N	James J. Malloy Town Manager Lexington Town Office Building 1625 Massachusetts Avenue Lexington, MA 02173	N	Suzanne E. Barry, Vice Chair, Board of Selectmen Lexington Town Office Building 1625 Massachusetts Avenue Lexington, MA 02420	N	Barbara Katzenberg, Member Hanscom Field Advisory Commission Lexington Town Office Building 1625 Massachusetts Avenue Lexington, MA 02173
Town of Concord					
N	Kerry Lafleur, Town Manager Town of Concord PO Box 535 Concord, MA 01742	N	Henry Dane, Chair Board of Selectman Town of Concord PO Box 535 Concord, MA 01742	N	Mark Giddings Hanscom Field Advisory Commission Representative PO Box 535 Concord, MA 01742
Town of Lincoln					
N	Timothy S. Higgins Town Administrator Lincoln Town Office 16 Lincoln Road, First Floor Lincoln, MA 01773	N	Jennifer Glass Chair, Board of Selectmen Lincoln Town Office 16 Lincoln Road Lincoln, MA 01773	N	Christopher Eliot Hanscom Field Advisory Commission Representative Lincoln Town Office 16 Lincoln Road Lincoln, MA 01773
City of Everett					
N	Carlo DeMaria, Mayor Everett City Hall 484 Broadway Everett, MA 02149	N	Frederick E. Cafasso, Chairman Planning Board Everett City Hall 484 Broadway, Room 25 Everett, MA 02149	N	Matt Lattanzi, Esq., Director Planning & Development Everett City Hall 484 Broadway, Room 25 Everett, MA 02149

City of Medford					
N	Breanna Lungo-Koehn, Mayor Medford City Hall 85 George Hassett Drive, Rm 202 Medford, MA 02155	N	Alicia Hunt, Director Office of Planning, Development, and Sustainability Medford City Hall 85 George Hassett Drive, Rm 308 Medford, MA 02155	N	Community Development Board Medford City Hall 85 George Hassett Drive Medford, MA 02155
Community Groups and Interested Parties					
Massport Community Advisory Committee (CAC)*					
N	Alan Wright, Chair Massport Community Advisory Committee c/o Law Office of Robert Allen, Jr. LLP 300 Washington Street Brookline, MA 02445	N	Aaron Toffler, Executive Director Massport Community Advisory Committee c/o Law Office of Robert Allen Jr., LLP 300 Washington Street Brookline, MA 02445		
Charlestown Neighborhood Council					
N	Tom Cunha, Chairman Charlestown Neighborhood Council PO Box 397 Charlestown, MA 02129	N	Mary Boucher, First Vice Chairman Charlestown Neighborhood Council PO Box 397 Charlestown, MA 02129		
Chelsea Community					
N	Almi Abeyta, President Rotary Club of Chelsea PO Box 505647 Chelsea, MA 02150	N	Rosalba Medina, Board President La Colaborativa 318 Broadway Chelsea, MA 02150	N	Paul Nowicki, President Chelsea Chamber of Commerce 308 Broadway Chelsea, MA 02150
N	Leo Robinson, Councilor At-Large Chelsea City Council Chelsea City Hall, Room #306 500 Broadway Chelsea, MA 02150				
Jamaica Plain Community					
N	Nancy Brooks and Maura Meagher 92 Bourne St Jamaica Plain, MA 02130	N	Marvin Kabakott 98 Bourne St Jamaica Plain, MA 02130	N	Martha Merson 19 Roseway St Jamaica Plain, MA 02130
N	Susan Morong 33 Bournedale Rd Jamaica Plain, MA 02130				

East Boston Community					
E	Neel Batra Gove Street Neighborhood Association neelesh.batra@gmail.com	N	Joseph Gaeta, Executive Director East Boston YMCA 215 Bremen Street East Boston, MA 02128	E	Noah Lewkowitz, Vice President Orient Heights Neighborhood Council orientheightsnc@gmail.com
N	Enilda Lovo, Lead Coordinator Neighbors United for a Better East Boston 19 Meridian Street, Suite #4 East Boston, MA 02128	N	Charles Marcella, Board Member Harbor View Neighborhood Association 178 Wordsworth Street East Boston, MA 02128	N	Christopher Marchi,* Vice President Airport Impact Relief Inc. 232 Orient Avenue East Boston, MA 02128
N	Gail Miller,* President Airport Impact Relief Inc. 232 Orient Avenue East Boston, MA 02128	E	Michelle Moon* Greenway Coordinator, Friends of the Mary Ellen Welch Greenway eastiegreenway@gmail.com	N	Louise Montanino, President East Boston Project Advisory Committee c/o 245 Summer Street, Suite 110 East Boston, MA 02128
N	Justin Pasquariello Executive Director, East Boston Social Centers 68 Central Square East Boston, MA 02128	N	Michael Triant, Executive Director Salesian Boys & Girls Club 150 Byron Street East Boston, MA 02128	N	Miguel Vargas, Executive Director East Boston Main Streets 154 Maverick Street, Suite 200 East Boston, MA 02128
E	Eagle Hill Civic Association 106 White Street East Boston, MA 02128 contact@eaglehillcivic.org	N	East Boston Chamber of Commerce 464 Bremen Street East Boston, MA 02128	E	Jeffries Point Neighborhood Association board@jeffriespoint.org
N	Commodore Jeffries Yacht Club 565 Sumner Street East Boston, MA 02128	N	Commodore Orient Heights Yacht Club 61 Bayswater Street East Boston, MA 02128	N	David Arinella 20 Thurston Street East Boston, MA 02128
P	Patricia D'Amore 95 Webster Street East Boston, MA 02128	N	Mary Berninger 156 St. Andrew Road East Boston, MA 02128	N	Fran Carb 174 Bayswater Street East Boston, MA 02128
N	Anna DiMaria, Esq. 23 Meridian Street East Boston, MA 02128	N	Joanne Pomodoro 683 Bennington Street East Boston, MA 02128	N	Fran Riley 193 Trenton Street East Boston, MA 02128
South Boston Community					
N	Luanne O'Connor, President City Point Neighborhood Association P.O. Box E-37 South Boston, MA 02127	N	William Spain, President Castle Island Association PO Box 342 South Boston, MA 02127	N	Anna White Mayor's Office of Neighborhood Services 1 City Hall Square, Room 805 Boston, MA 02201

South Boston Community (*continued*)					
N	Fort Point Neighborhood Association Box 52122 Boston, MA 02205	E	Seaport Alliance for a Neighborhood Design mail5001@seaportalliance.org	N	Lucky Devlin 718 East Second Street South Boston, MA 02127
N	Ellie Kasper St. Vincent's Neighborhood Association 125 West Third Street South Boston, MA 02127				
Winthrop Community					
N	Marc Chapdelaine, President Winthrop Chamber of Commerce 207 Hagman Road Winthrop, MA 02152	N	Chris Crocker, Vice President Winthrop Chamber of Commerce 207 Hagman Road Winthrop, MA 02152	N	Betsy Shane, Executive Director Winthrop Chamber of Commerce 207 Hagman Road Winthrop, MA 02152
N	Kannan Thiruvengadam, President Friends of Belle Isle Marsh P.O. Box 575 East Boston, MA 02128	N	Robert Pulsifer 30 Sagamore Avenue Winthrop, MA 02152	N	John Vitagliano 19 Seymour Street Winthrop, MA 02152
Massport Business Group					
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N	Kendalle Burlin O'Connell, Esg., CEO and President Massachusetts Biotechnology Council 700 Technology Square, 5th Floor Cambridge, MA 02139	N	Richard A. Dimino, President Emeritus, A Better City 14 Beacon Street, Suite 402 Boston, MA 02108	N	Rob McCarron, President Association of Independent Colleges and Universities, Massachusetts Chapter 5 Brighton Street Belmont, MA 02478
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Community Groups and Interested Parties

Community-based organizations and tribal organizations are receiving notification of this filing in accordance with the MEPA Public Involvement Protocol for Environmental Justice Populations, which took effect on January 1, 2022. More information is available on the MEPA website.

Statewide Environmental Justice Community Based Organizations					
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Local Community Based Organizations (continued)					
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